In[1]:=
```
(* Mathematica code for Model1 of Eshra et al. eLife 2021 *)
(* Stefan Hallermann and Hartmut Schmidt Aug 2021 *)
```

# Import

## general

In[2]:=
```
(* all Ca in uM, all times in ms, all ampltiudes and Nv in vesicels *)
```

In[3]:=
```
CmToVesConversionFactor = (1/90.12) * (1/70*^-18);(* explained in methods *)
```

In[4]:=
```
rrp = 10;(* pool of release-ready vesicles per connection *)
```

In[5]:=
```
dir = NotebookDirectory[];
SetDirectory[dir];
dataFolder = "../data to fit/";
```

## tau1 Cm 5kHz

In[8]:=
```
data = Import[dataFolder <> "all_t1_v02_C5.txt", "Table"];
```

In[9]:=
```
dataT1C5Ca = 0.001 * data[[All, 1]];
dataT1C5RelRate = 1000. * data[[All, 2]];
dataT1C5Delay = data[[All, 3]];
dataT1C5ChiRatio = data[[All, 4]];
dataT1C5Amplitude = CmToVesConversionFactor data[[All, 5]];

dataT1C5Nv = Table[0, {7}];
tmp1 = 1;
tmp2 = 6;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C5Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
```

# tau1 Cm 10kHz

In[22]:=
```
data = Import[dataFolder <> "all_t1_v02_C10.txt", "Table"];
```

In[23]:=
```
dataT1C10Ca = 0.001 * data[[All, 1]];
dataT1C10RelRate = 1000. * data[[All, 2]];
dataT1C10Delay = data[[All, 3]];
dataT1C10ChiRatio = data[[All, 4]];
dataT1C10Amplitude = CmToVesConversionFactor data[[All, 5]];

dataT1C10Nv = Table[0, {7}];
tmp1 = 1;
tmp2 = 6;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
tmp1 += 1;
tmp2 += 1;
dataT1C10Nv[[tmp1]] = CmToVesConversionFactor data[[All, tmp2]];
```

# tau1 Deconv

In[36]:=
```
data = Import[dataFolder <> "all_t1_v02_D.txt", "Table"];
```

In[37]:=
```
dataT1DCa = 0.001 * data[[All, 1]];
dataT1DRelRate = 1000. * data[[All, 2]];
dataT1DDelay = data[[All, 3]];
dataT1DChiRatio = data[[All, 4]];
dataT1DAmplitude = data[[All, 5]];

dataT1DNv = Table[0, {7}];
tmp1 = 1; tmp2 = 6; dataT1DNv[[tmp1]] = data[[All, tmp2]];
tmp1 += 1; tmp2 += 1; dataT1DNv[[tmp1]] = data[[All, tmp2]];
tmp1 += 1; tmp2 += 1; dataT1DNv[[tmp1]] = data[[All, tmp2]];
tmp1 += 1; tmp2 += 1; dataT1DNv[[tmp1]] = data[[All, tmp2]];
tmp1 += 1; tmp2 += 1; dataT1DNv[[tmp1]] = data[[All, tmp2]];
tmp1 += 1; tmp2 += 1; dataT1DNv[[tmp1]] = data[[All, tmp2]];
tmp1 += 1; tmp2 += 1; dataT1DNv[[tmp1]] = data[[All, tmp2]];
```

# tau2 Cm 5kHz

In[50]:=
```
data = Import[dataFolder <> "all_t2_v02_C5.txt", "Table"];
```

In[51]:=
```
dataT2C5Ca = 0.001 * data[[All, 1]];
dataT2C5RelRate = 1000. * data[[All, 2]];
dataT2C5Amplitude2 = CmToVesConversionFactor data[[All, 3]];
dataT2C5Amplitude1 = CmToVesConversionFactor data[[All, 4]];
```

# tau2 Cm 10kHz

In[55]:=
```
data = Import[dataFolder <> "all_t2_v02_C10.txt", "Table"];
```

In[56]:=
```
dataT2C10Ca = 0.001 * data[[All, 1]];
dataT2C10RelRate = 1000. * data[[All, 2]];
dataT2C10Amplitude2 = CmToVesConversionFactor data[[All, 3]];
dataT2C10Amplitude1 = CmToVesConversionFactor data[[All, 4]];
```

# tau2 Deconv

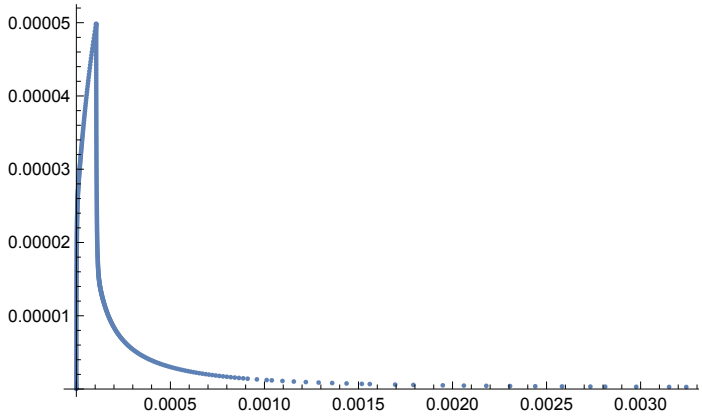
In[59]:=
```
data = Import[dataFolder <> "all_t2_v02_D.txt", "Table"];
```

In[60]:=
```
dataT2DCa = 0.001 * data[[All, 1]];
dataT2DRelRate = 1000. * data[[All, 2]];
dataT2DAmplitude2 = data[[All, 3]];
dataT2DAmplitude1 = data[[All, 4]];
```

# local Ca

In[64]:=
```
data = Import[dataFolder <> "local Ca at 20 nm in uM and ms.txt", "Table"];
dataLocalCa = 1*^-6 data[[All, 1]];
dataLocalCaTime = 1*^-3 data[[All, 2]];
ListPlot[Transpose[{dataLocalCaTime, dataLocalCa}], PlotRange → All]
```

Out[67]=



# General parameters and definitions

## general stuff

In[68]:=
```
(* for calulations: time in s, Ca in M *)
numberOfFitParamToBeSaved = 16;
(*
1 max release

 Mono
2 chi2Mono
3 delayMono
4 ampMono
5 1/tau1Mono

 Bi
6 chi2Mono/chi2Bi
7 delay
8 amp
9 amp1 (=amp*relative amp1)
10 1/tau1
11 1/tau2

 merge
12 delay
13 amp
14 amp1
15 1/tau1
16 1/tau2
*)
cursorStart = -0.002;(*s*)
cursorEnd = 0.01;(*s*)
cursorEndLong = 0.061;(*s*)
timeOfNv = {0.0001, 0.0002, 0.001, 0.005, 0.01, 0.1, 0.4};
SeedRandom[1];
myMaxIterations = 100;
```

In[75]:=
```
timeStart = AbsoluteTime[]
```

Out[75]= $3.841505782393744 \times 10^{9}$

# noiseRepeats

In[76]:=
```
noiseRepeats = 50;
(* should be increased to 50 for a full dataset *)
myQuantile1 = 0.25;
myQuantile2 = 0.75;
```

# export parameters

In[79]:=
```
dtOfPlotsForExport = 20*^-5;
exportYes = 1;
```

# sampling and myNoise

In[81]:=
```
samplingOfDataInKHzC5 = 5;
myNoiseC5 = 0.1;(*cannot be 0*)
signalToNoiseRatioC5 = 1.;(*minimum s-to-n-ratio to attempt fitting*)
dtOfDataC5 = (1 / (1000 * samplingOfDataInKHzC5));

samplingOfDataInKHzC10 = 10;
myNoiseC10 = 0.1;(*cannot be 0*)
signalToNoiseRatioC10 = 1.;(*minimum s-to-n-ratio to attempt fitting*)
dtOfDataC10 = (1 / (1000 * samplingOfDataInKHzC10));

samplingOfDataInKHzD = 10;
myNoiseD = 0.02;(*cannot be 0*)
signalToNoiseRatioD = 1.;(*minimum s-to-n-ratio to attempt fitting*)
dtOfDataD = (1 / (1000 * samplingOfDataInKHzD));

samplingOfDataInKHzLong = 1;
myNoiseLong = 0.1;(*cannot be 0*)
dtOfDataLong = (1 / (1000 * samplingOfDataInKHzLong));
```

## number of simulations per DMN

In[96]:=
```
aNumberDMN05 = 2;
aNumberDMN2 = 2;
aNumberDMN10 = 2;

(* for full dataset: *)
aNumberDMN05 = 2 * 20;
aNumberDMN2 = 2 * 17;
aNumberDMN10 = 2 * 10;
```

## Exp fit function

In[102]:=
```
myFitMono[t_] :=
  If[t <= delayMono, 0, ampMono (1 - Exp[-(t - delayMono) / tau1Mono])];

myFitBi[t_] := If[t <= delay, 0,
   amp (1 - amp1 Exp[-(t - delay) / tau1] - (1 - amp1) Exp[-(t - delay) / tau2])];

(*guess for 10 uM; will be changed according to a power of 1 law*)(*in s*)
ampGuess = 2.;(*each pool has size 1.0*)
tau1Guess = 0.001;(*in s*)
delayGuess = 0.0005;(*in s*)
amp1Guess = 0.5;
```

# Calculate Ca transients

First, the resting conditions are  numerically calculated. Subsequently, the resulting values are used as initial conditions for the main simulations of the flash-evoked Ca2+ transitions . All calculations are repeated in a loop with increasing uncaging efficacy for three different DMN concentrations. The resulting free Ca2+ concentration is later used to drive the release schemes.

## General definitions for all DMN conc.

In[108]:=
```
CaListReal = CaListDye = {};
```

## 0.5 mM DMN

# general parameters

In[109]:=
```
TimeWindow = 0.006; (*End of simulation*)
tflash = 0.0;  (*Time of flash*)
PlStart = 0.; (*Plot start*)

af = 0.67; (*fast uncaging fraction; Faas et al*)

(*Select dye*)
OGB1 = 0;
OGB5N = 0;
OGB6F = 0;
Fluo5F = 1;

CaRest = 227. * 10^-9; (*Free pre-flash rersting Ca;
equilibrates with all buffers and DM*)
MgT = 0.5 * 10^-3; (*total Mg in pipette*)
γ = 0.; (*Pump rate*)

(*Concentrations of dye, buffers, DM*)
OGtotal = 50. * 10^-6 ;
ATPtotal = 5. * 10^-3 ;
MBtotal = 480. * 10^-6 ;(*(*Delvendahl, PNAS, 2015*)*)

DMT = 0.5 * 10^-3;  (*total concentration of DMn *)
(*uncaging efficiency*)
aStartDMN05 = 0.08;
aEndDMN05 = 0.5;
```

# definitions and loop

In[126]:=
```
(*Dye*)
If[OGB1 == 1,
 kOnOG  = 4.3 * 10^8;
kOffOG = 103.;]

If[OGB5N == 1,
 kOnOG  = 2.5 * 10^8;
kOffOG = 6000. * 31.4 / 24;]

If[OGB6F == 1,
 kOnOG  = 3. * 10^8;
kOffOG = 900.;]

If[Fluo5F == 1,
```

```
 kOnOG  = 3. * 10^8;
kOffOG = 249.;] (*Delvendahl PNAS; before: 432*)

KdOG = kOffOG / kOnOG;
kappaOG = OGtotal / KdOG;

(*ATP*)
kOnATP  = 5. * 10^8;
kOffATP = 100 000.;
kOnMgATP  = 1. * 10^7; (*Bollmann Dissertation S. 59; *)
kOffMgATP = 1000.;

KdATP = kOffATP / kOnATP;
kappaATP = ATPtotal / KdATP;
KdMgATP = kOffMgATP / kOnMgATP;

(*DM*)
If[MgT == 0.,
 kOnDM = 1.98 * 10^7; (*Faas Plos Biol, 2007*)
kOffDM = 0.14;
 ,
 kOnDM = 2.9 * 10^7; (*Faas Biophys J, 2005*)
kOffDM = 0.19;
]

(*Mg binding constants for DMn, DMf, DMs*)
kOnMg = 1.3 * 10^5; (*all values for Mg are from Faas et al., 2005*)
kOffMg = 0.2;

(*Ca binding constants for PP*)
kOnPP2 = kOnPP1 = kOnDM;
kOffPP2 = 3.6 * 10 ^ 3;
If[MgT == 0.,
 kOffPP1 = 7. * 10 ^ 4;,
 kOffPP1 = 6.9 * 10 ^ 4; ]

(*Mg binding constants for PP1,PP2*)
kOffMgPP = 3. * 10 ^ 2; (*for PP1,PP2*)
konMgPP = kOnMg; (*koMgPP not used in below diff. eq., only kOnMg*)

(*Equilibrium constants (not complete)*)
KdDM = kOffDM / kOnDM;
KdPP1 = kOffPP1 / kOnPP1;
KdMg = kOffMg / kOnMg;
kappaDM = DMT / KdDM;
```

```
 (*Endogenous buffer*)
kOnMB  = 5 * 10^8;(*Delvendahl, PNAS, 2015*)
kOffMB = 16 000;
KdMB = kOffMB / kOnMB;

TRest = 1000.;


(*----------------------------------  Loop  ----------
 ----------------------------------------*)
(*----------------------------------  Loop  ----------
 ----------------------------------------*)
(*----------------------------------  Loop  ----------
 ----------------------------------------*)


For[aCount = 1, aCount ≤ aNumberDMN05, aCount += 1,
  a = 10 ^ (Log10[aStartDMN05] +
      (aCount - 1) * (Log10[aEndDMN05] - Log10[aStartDMN05]) / (aNumberDMN05 - 1));

  (*------------------------- Resting
    Equations -------------------------------------------*)

  (*Dye*)
  OGRest := {

    OG[0] == OGtotal,
    CaOG[0] == 0,

    OG'[tt] == -kOnOG * CaRest * OG[tt] + kOffOG * CaOG[tt],
    CaOG'[tt] == kOnOG * CaRest * OG[tt] - kOffOG * CaOG[tt]
   }
  ;

  (*ATP*)
  ATPRest := {

    ATP[0] == ATPtotal,
    CaATP[0] == 0,
    MgATP[0] == 0,

    ATP'[tt] == -kOnATP * CaRest * ATP[tt] + kOffATP * CaATP[tt] -
      kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt],
    CaATP'[tt] == kOnATP * CaRest * ATP[tt] - kOffATP * CaATP[tt],
    MgATP'[tt] == kOnMgATP * Mg[tt] * ATP[tt] - kOffMgATP * MgATP[tt]

   }
```

```
;

(*DM nitrophene*)
DMnRest := {

  DMn[0] == (1 - a) * DMT,
  CaDMn[0] == 0.,
  MgDMn[0] == 0.,

  DMn'[tt] == -kOnDM * CaRest * DMn[tt] +
    kOffDM * CaDMn[tt] - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt],
  CaDMn'[tt] == kOnDM * CaRest * DMn[tt] - kOffDM * CaDMn[tt],
  MgDMn'[tt] == kOnMg * Mg[tt] * DMn[tt] - kOffMg * MgDMn[tt]
 }

;
DMfRest := {

  DMf[0] == a * af * DMT,
  CaDMf[0] == 0.,
  MgDMf[0] == 0.,

  DMf'[tt] == -kOnDM * CaRest * DMf[tt] +
    kOffDM * CaDMf[tt] - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt],
  CaDMf'[tt] == kOnDM * CaRest * DMf[tt] - kOffDM * CaDMf[tt],
  MgDMf'[tt] == kOnMg * Mg[tt] * DMf[tt] - kOffMg * MgDMf[tt]
 }

;
DMsRest := {

  DMs[0] == a * (1 - af) * DMT,
  CaDMs[0] == 0.,
  MgDMs[0] == 0.,

  DMs'[tt] == -kOnDM * CaRest * DMs[tt] +
    kOffDM * CaDMs[tt] - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt],
  CaDMs'[tt] == kOnDM * CaRest * DMs[tt] - kOffDM * CaDMs[tt],
  MgDMs'[tt] == kOnMg * Mg[tt] * DMs[tt] - kOffMg * MgDMs[tt]
 }
;

(*Endogeneous buffer*)
MBRest := {

  MB[0] == MBtotal,
```

```
  CaMB[0] == 0,

  MB'[tt] == -kOnMB * CaRest * MB[tt] + kOffMB * CaMB[tt],
  CaMB'[tt] == kOnMB * CaRest * MB[tt] - kOffMB * CaMB[tt]
 }

;

(*Free Mg*)
MgfRest := {
  Mg[0] == MgT,

  Mg'[tt] ==
   -kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt]
    - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt]
    - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt]
    - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt]
 }

;
EqRest := {ATPRest, MgfRest, OGRest, DMnRest, DMfRest, DMsRest, MBRest};
VarsRest := {ATP, Mg, CaATP, MgATP, CaOG, OG, DMn,
  CaDMn, MgDMn, DMf, CaDMf, MgDMf, DMs, CaDMs, MgDMs, MB, CaMB}
;
solr := NDSolve[EqRest, VarsRest, {tt, 0, TRest}]
;

Ca0 = CaRest;
Mg0 = Extract[Mg[TRest] /. solr, 1];
ATP0 = Extract[ATP[TRest] /. solr, 1];
CaATP0 = Extract[CaATP[TRest] /. solr, 1];
MgATP0 = Extract[MgATP[TRest] /. solr, 1];
OG0 = Extract[OG[TRest] /. solr, 1];
CaOG0 = Extract[CaOG[TRest] /. solr, 1];
DMn0 = Extract[DMn[TRest] /. solr, 1];
CaDMn0 = Extract[CaDMn[TRest] /. solr, 1];
MgDMn0 = Extract[MgDMn[TRest] /. solr, 1];
DMf0 = Extract[DMf[TRest] /. solr, 1];
CaDMf0 = Extract[CaDMf[TRest] /. solr, 1];
MgDMf0 = Extract[MgDMf[TRest] /. solr, 1];
DMs0 = Extract[DMs[TRest] /. solr, 1];
CaDMs0 = Extract[CaDMs[TRest] /. solr, 1];
MgDMs0 = Extract[MgDMs[TRest] /. solr, 1];
MB0 = Extract[MB[TRest] /. solr, 1];
CaMB0 = Extract[CaMB[TRest] /. solr, 1];
```

```
  ClearAll[EqRest, VarsRest];


  (*------------------------- Flash
    Equations -------------------------------------------*)

  (*Dye*)
  BufferOG := {

    OG[0] == OG0,
    CaOG[0] == CaOG0,

    OG'[tt] == -kOnOG * Ca[tt] * OG[tt] + kOffOG * CaOG[tt],
    CaOG'[tt] == kOnOG * Ca[tt] * OG[tt] - kOffOG * CaOG[tt]}
  ;

  (*ATP*)
BufferATP := {

    ATP[0] == ATP0,
    CaATP[0] == CaATP0,
    MgATP[0] == MgATP0,

    ATP'[tt] == -kOnATP * Ca[tt] * ATP[tt] + kOffATP * CaATP[tt] -
      kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt],
    CaATP'[tt] == kOnATP * Ca[tt] * ATP[tt] - kOffATP * CaATP[tt],
    MgATP'[tt] == kOnMgATP * Mg[tt] * ATP[tt] - kOffMgATP * MgATP[tt]
   }
  ;

  (*fast (tauf) and slow (taus) time constants for uncageing;
  Faas et al., 2005,2007*)
If[MgT == 0.,
   tauf = 15.2 * 10^-6;  (*Faas, 2007*)
   taus = 1.9 * 10^-3;
   ,
   tauf = 15. * 10^-6;  (*Faas,2005*)
   taus = 2. * 10^-3; ]

  ;

  (*The differential equations*)
  (*non uncaging fraction of DMn*)
  BufferDMn := {

    DMn[0] == DMn0,
    CaDMn[0] == CaDMn0,
```

```
  MgDMn[0] == MgDMn0,

  DMn'[tt] == -kOnDM * Ca[tt] * DMn[tt] +
    kOffDM * CaDMn[tt] - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt],
  CaDMn'[tt] == kOnDM * Ca[tt] * DMn[tt] - kOffDM * CaDMn[tt],
  MgDMn'[tt] == kOnMg * Mg[tt] * DMn[tt] - kOffMg * MgDMn[tt]
 }
;

(*fast uncaging fraction of DMn*)
BufferDMf := {

  DMf[0] == DMf0,
  CaDMf[0] == CaDMf0,
  MgDMf[0] == MgDMf0,

  DMf'[tt] == -kOnDM * Ca[tt] * DMf[tt] + kOffDM * CaDMf[tt] - kOnMg * Mg[tt] *
     DMf[tt] + kOffMg * MgDMf[tt] - 1 / tauf * DMf[tt] * UnitStep[tt - tflash],
  CaDMf'[tt] == kOnDM * Ca[tt] * DMf[tt] - kOffDM * CaDMf[tt] -
    1 / tauf * CaDMf[tt] * UnitStep[tt - tflash],
  MgDMf'[tt] == kOnMg * Mg[tt] * DMf[tt] - kOffMg * MgDMf[tt] -
    1 / tauf * MgDMf[tt] * UnitStep[tt - tflash]
 }

;
(*slow uncaging fraction of DMn*)
BufferDMs := {

  DMs[0] == DMs0,
  CaDMs[0] == CaDMs0,
  MgDMs[0] == MgDMs0,

  DMs'[tt] == -kOnDM * Ca[tt] * DMs[tt] + kOffDM * CaDMs[tt] - kOnMg * Mg[tt] *
     DMs[tt] + kOffMg * MgDMs[tt] - 1 / taus * DMs[tt] * UnitStep[tt - tflash],
  CaDMs'[tt] == kOnDM * Ca[tt] * DMs[tt] - kOffDM * CaDMs[tt] -
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],
  MgDMs'[tt] == kOnMg * Mg[tt] * DMs[tt] - kOffMg * MgDMs[tt] -
    1 / taus * MgDMs[tt] * UnitStep[tt - tflash]
 }
;

(*Photoproducts*)
(*PP2: comes from DMf,DMs and MgDMf,MgDMs; but also binds Ca*)
BufferPP2 := {

  PP2[0] == 0,
  CaPP2[0] == 0,
```

```
  MgPP2[0] == 0,

  PP2'[tt] == -kOnPP2 * Ca[tt] * PP2[tt] + kOffPP2 * CaPP2[tt] -
    kOnMg * Mg[tt] * PP2[tt] + kOffMgPP * MgPP2[tt] + 2 * (1 / tauf * DMf[tt] *
        UnitStep[tt - tflash] + 1 / taus * DMs[tt] * UnitStep[tt - tflash])
    + 1 / tauf * MgDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * MgDMs[tt] * UnitStep[tt - tflash],

  CaPP2'[tt] == kOnPP2 * Ca[tt] * PP2[tt] - kOffPP2 * CaPP2[tt],

  MgPP2'[tt] == kOnMg * Mg[tt] * PP2[tt] - kOffMgPP * MgPP2[tt] + 1 / tauf *
     MgDMf[tt] * UnitStep[tt - tflash] + 1 / taus * MgDMs[tt] * UnitStep[tt - tflash]
 }
;

(*PP1: Comes from CaDMf,CaDMs and binds Ca and Mg*)
BufferPP1 := {

  PP1[0] == 0,
  CaPP1[0] == 0,
  MgPP1[0] == 0,

  PP1'[tt] == -kOnPP1 * Ca[tt] * PP1[tt] +
    kOffPP1 * CaPP1[tt] - kOnMg * Mg[tt] * PP1[tt] + kOffMgPP * MgPP1[tt]
    + 1 / tauf * CaDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],

  CaPP1'[tt] == kOnPP1 * Ca[tt] * PP1[tt] -
    kOffPP1 * CaPP1[tt] + 1 / tauf * CaDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],

  MgPP1'[tt] == kOnMg * Mg[tt] * PP1[tt] - kOffMgPP * MgPP1[tt]

 }
;

(*Endogeneous Buffer*)
BufferMB := {

  MB[0] == MB0,
  CaMB[0] == CaMB0,

  MB'[tt] == -kOnMB * Ca[tt] * MB[tt] + kOffMB * CaMB[tt],
  CaMB'[tt] == kOnMB * Ca[tt] * MB[tt] - kOffMB * CaMB[tt]}

;
```

```
(*Clear[Eqns,Vars,sol]*)

  (*Free Ca*)
  FreeCa := {
    Ca[0] == Ca0,

    Ca'[tt] == -γ * (Ca[tt] - CaRest)
      (*DMn*)
      - kOnPP1 * Ca[tt] * PP1[tt] + kOffPP1 * CaPP1[tt]
      - kOnPP2 * Ca[tt] * PP2[tt] + kOffPP2 * CaPP2[tt]
      - kOnDM * Ca[tt] * DMn[tt] + kOffDM * CaDMn[tt]
      - kOnDM * Ca[tt] * DMf[tt] + kOffDM * CaDMf[tt]
      - kOnDM * Ca[tt] * DMs[tt] + kOffDM * CaDMs[tt]
      (*buffers*)
      - kOnATP * Ca[tt] * ATP[tt] + kOffATP * CaATP[tt]
      - kOnMB * Ca[tt] * MB[tt] + kOffMB * CaMB[tt]
      (*dye*)
      - kOnOG * Ca[tt] * OG[tt] + kOffOG * CaOG[tt]
    }
  ;

  (*Free Mg*)
  FreeMg := {
    Mg[0] == Mg0,

    Mg'[tt] ==
     -kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt]
      - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt]
      - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt]
      - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt]
      - kOnMg * Mg[tt] * PP2[tt] + kOffMgPP * MgPP2[tt]
      - kOnMg * Mg[tt] * PP1[tt] + kOffMgPP * MgPP1[tt]
   }

  ;

  Eqns := {BufferDMn, BufferDMf, BufferDMs, BufferATP,
    BufferPP1, BufferPP2, FreeCa, FreeMg, BufferMB, BufferOG}
  ;
  Vars := {ATP, CaATP, MgATP, Ca, Mg, CaDMn, DMn, CaDMf, DMf, CaDMs,
    DMs, CaPP1, PP1, CaPP2, PP2, MgPP2, MgPP1, MB, CaMB, OG, CaOG}
  ;
  sol := NDSolve[Eqns, Vars, {tt, 0., TimeWindow}
    (*,Method→{"EquationSimplification"->"Solve"}*)]
  ;
  CafP = Extract[Ca[TimeWindow] /. sol, 1];
  CafOG = KdOG * CaOG[tt] / OG[tt];
```

```
    AppendTo[CaListReal, Evaluate[{Ca[tt]} /. sol]];
    AppendTo[CaListDye, Evaluate[{CafOG} /. sol]];

  ];
```

# 2 mM DMN

## general parameters

In[156]:=
```
TimeWindow = 0.006; (*End of simulation*)
tflash = 0.0;  (*Time of flash*)
PlStart = 0.; (*Plot start*)

af = 0.67; (*fast uncaging fraction; Faas et al*)

(*Select dye*)
OGB1 = 0;
OGB5N = 1;
OGB6F = 0;
Fluo5F = 0;

CaRest = 227. * 10^-9; (*Free pre-flash rersting Ca;
equilibrates with all buffers and DM*)
MgT = 0.5 * 10^-3; (*total Mg in pipette*)
γ = 0.; (*Pump rate*)

(*Concentrations of dye, buffers, DM*)
OGtotal = 200. * 10^-6 ;
ATPtotal = 5. * 10^-3 ;
MBtotal = 480. * 10^-6 ;(*(*Delvendahl, PNAS, 2015*)*)

DMT = 2. * 10^-3;  (*total concentration of DMn *)
(*uncaging efficiency*)
aStartDMN2 = 0.15;
aEndDMN2 = 0.55;
```

## definitions and loop

In[173]:=
```
(*Dye*)
If[OGB1 == 1,
 kOnOG  = 4.3 * 10^8;
kOffOG = 103.;]
```

```
If[OGB5N == 1,
 kOnOG  = 2.5 * 10^8;
kOffOG = 6000. * 31.4 / 24;]

If[OGB6F == 1,
 kOnOG  = 3. * 10^8;
kOffOG = 900.;]

If[Fluo5F == 1,
 kOnOG  = 3. * 10^8;
kOffOG = 249.;] (*Delvendahl PNAS; before: 432*)

KdOG = kOffOG / kOnOG;
kappaOG = OGtotal / KdOG;

(*ATP*)
kOnATP  = 5. * 10^8;
kOffATP = 100 000.;
kOnMgATP  = 1. * 10^7; (*Bollmann Dissertation S. 59; *)
kOffMgATP = 1000.;

KdATP = kOffATP / kOnATP;
kappaATP = ATPtotal / KdATP;
KdMgATP = kOffMgATP / kOnMgATP;

(*DM*)
If[MgT == 0.,
 kOnDM = 1.98 * 10^7; (*Faas Plos Biol, 2007*)
kOffDM = 0.14;
 ,
 kOnDM = 2.9 * 10^7; (*Faas Biophys J, 2005*)
kOffDM = 0.19;
]

(*Mg binding constants for DMn, DMf, DMs*)
kOnMg = 1.3 * 10^5; (*all values for Mg are from Faas et al., 2005*)
kOffMg = 0.2;

(*Ca binding constants for PP*)
kOnPP2 = kOnPP1 = kOnDM;
kOffPP2 = 3.6 * 10 ^ 3;
If[MgT == 0.,
 kOffPP1 = 7. * 10 ^ 4;,
 kOffPP1 = 6.9 * 10 ^ 4; ]

(*Mg binding constants for PP1,PP2*)
```

```
kOffMgPP = 3. * 10 ^ 2; (*for PP1,PP2*)
konMgPP = kOnMg; (*koMgPP not used in below diff. eq., only kOnMg*)

(*Equilibrium constants (not complete)*)
KdDM = kOffDM / kOnDM;
KdPP1 = kOffPP1 / kOnPP1;
KdMg = kOffMg / kOnMg;
kappaDM = DMT / KdDM;

 (*Endogenous buffer*)
kOnMB = 5 * 10^8;(*Delvendahl, PNAS, 2015*)
kOffMB = 16 000;
KdMB = kOffMB / kOnMB;

TRest = 1000.;


(*----------------------------------  Loop  ----------
 ----------------------------------------*)
(*----------------------------------  Loop  ----------
 ----------------------------------------*)
(*----------------------------------  Loop  ----------
 ----------------------------------------*)

For[aCount = 1, aCount ≤ aNumberDMN2, aCount += 1,
  a = 10 ^ (Log10[aStartDMN2] +
      (aCount - 1) * (Log10[aEndDMN2] - Log10[aStartDMN2]) / (aNumberDMN2 - 1));

  (*------------------------- Resting
    Equations ------------------------------------------*)

  (*Dye*)
  OGRest := {

    OG[0] == OGtotal,
    CaOG[0] == 0,

    OG'[tt] == -kOnOG * CaRest * OG[tt] + kOffOG * CaOG[tt],
    CaOG'[tt] == kOnOG * CaRest * OG[tt] - kOffOG * CaOG[tt]
   }
  ;

  (*ATP*)
  ATPRest := {

    ATP[0] == ATPtotal,
    CaATP[0] == 0,
```

```
  MgATP[0] == 0,

  ATP'[tt] == -kOnATP * CaRest * ATP[tt] + kOffATP * CaATP[tt] -
    kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt],
  CaATP'[tt] == kOnATP * CaRest * ATP[tt] - kOffATP * CaATP[tt],
  MgATP'[tt] == kOnMgATP * Mg[tt] * ATP[tt] - kOffMgATP * MgATP[tt]

 }

;

(*DM nitrophene*)
DMnRest := {

  DMn[0] == (1 - a) * DMT,
  CaDMn[0] == 0.,
  MgDMn[0] == 0.,

  DMn'[tt] == -kOnDM * CaRest * DMn[tt] +
    kOffDM * CaDMn[tt] - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt],
  CaDMn'[tt] == kOnDM * CaRest * DMn[tt] - kOffDM * CaDMn[tt],
  MgDMn'[tt] == kOnMg * Mg[tt] * DMn[tt] - kOffMg * MgDMn[tt]
 }

;
DMfRest := {

  DMf[0] == a * af * DMT,
  CaDMf[0] == 0.,
  MgDMf[0] == 0.,

  DMf'[tt] == -kOnDM * CaRest * DMf[tt] +
    kOffDM * CaDMf[tt] - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt],
  CaDMf'[tt] == kOnDM * CaRest * DMf[tt] - kOffDM * CaDMf[tt],
  MgDMf'[tt] == kOnMg * Mg[tt] * DMf[tt] - kOffMg * MgDMf[tt]
 }

;
DMsRest := {

  DMs[0] == a * (1 - af) * DMT,
  CaDMs[0] == 0.,
  MgDMs[0] == 0.,

  DMs'[tt] == -kOnDM * CaRest * DMs[tt] +
    kOffDM * CaDMs[tt] - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt],
  CaDMs'[tt] == kOnDM * CaRest * DMs[tt] - kOffDM * CaDMs[tt],
```

```
    MgDMs'[tt] == kOnMg * Mg[tt] * DMs[tt] - kOffMg * MgDMs[tt]
   }
  ;

  (*Endogeneous buffer*)
  MBRest := {

    MB[0] == MBtotal,
    CaMB[0] == 0,

    MB'[tt] == -kOnMB * CaRest * MB[tt] + kOffMB * CaMB[tt],
    CaMB'[tt] == kOnMB * CaRest * MB[tt] - kOffMB * CaMB[tt]
   }

  ;

  (*Free Mg*)
  MgfRest := {
    Mg[0] == MgT,

    Mg'[tt] ==
     -kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt]
      - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt]
      - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt]
      - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt]
   }

  ;
  EqRest := {ATPRest, MgfRest, OGRest, DMnRest, DMfRest, DMsRest, MBRest};
  VarsRest := {ATP, Mg, CaATP, MgATP, CaOG, OG, DMn,
    CaDMn, MgDMn, DMf, CaDMf, MgDMf, DMs, CaDMs, MgDMs, MB, CaMB}
  ;
  solr := NDSolve[EqRest, VarsRest, {tt, 0, TRest}]
  ;

  Ca0 = CaRest;
  Mg0 = Extract[Mg[TRest] /. solr, 1];
  ATP0 = Extract[ATP[TRest] /. solr, 1];
  CaATP0 = Extract[CaATP[TRest] /. solr, 1];
  MgATP0 = Extract[MgATP[TRest] /. solr, 1];
  OG0 = Extract[OG[TRest] /. solr, 1];
  CaOG0 = Extract[CaOG[TRest] /. solr, 1];
  DMn0 = Extract[DMn[TRest] /. solr, 1];
  CaDMn0 = Extract[CaDMn[TRest] /. solr, 1];
  MgDMn0 = Extract[MgDMn[TRest] /. solr, 1];
  DMf0 = Extract[DMf[TRest] /. solr, 1];
  CaDMf0 = Extract[CaDMf[TRest] /. solr, 1];
```

```
  MgDMf0 = Extract[MgDMf[TRest] /. solr, 1];
  DMs0 = Extract[DMs[TRest] /. solr, 1];
  CaDMs0 = Extract[CaDMs[TRest] /. solr, 1];
  MgDMs0 = Extract[MgDMs[TRest] /. solr, 1];
  MB0 = Extract[MB[TRest] /. solr, 1];
  CaMB0 = Extract[CaMB[TRest] /. solr, 1];


  ClearAll[EqRest, VarsRest];


  (*------------------------- Flash
    Equations -------------------------------------------*)

  (*Dye*)
  BufferOG := {

    OG[0] == OG0,
    CaOG[0] == CaOG0,

    OG'[tt] == -kOnOG * Ca[tt] * OG[tt] + kOffOG * CaOG[tt],
    CaOG'[tt] == kOnOG * Ca[tt] * OG[tt] - kOffOG * CaOG[tt]}
  ;

  (*ATP*)
BufferATP := {

    ATP[0] == ATP0,
    CaATP[0] == CaATP0,
    MgATP[0] == MgATP0,

    ATP'[tt] == -kOnATP * Ca[tt] * ATP[tt] + kOffATP * CaATP[tt] -
      kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt],
    CaATP'[tt] == kOnATP * Ca[tt] * ATP[tt] - kOffATP * CaATP[tt],
    MgATP'[tt] == kOnMgATP * Mg[tt] * ATP[tt] - kOffMgATP * MgATP[tt]
   }
  ;

  (*fast (tauf) and slow (taus) time constants for uncageing;
  Faas et al., 2005,2007*)
If[MgT == 0.,
   tauf = 15.2 * 10^-6;  (*Faas, 2007*)
   taus = 1.9 * 10^-3;
   ,
   tauf = 15. * 10^-6;  (*Faas,2005*)
   taus = 2. * 10^-3; ]
```

```
;

(*The differential equations*)
(*non uncaging fraction of DMn*)
BufferDMn := {

  DMn[0] == DMn0,
  CaDMn[0] == CaDMn0,
  MgDMn[0] == MgDMn0,

  DMn'[tt] == -kOnDM * Ca[tt] * DMn[tt] +
    kOffDM * CaDMn[tt] - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt],
  CaDMn'[tt] == kOnDM * Ca[tt] * DMn[tt] - kOffDM * CaDMn[tt],
  MgDMn'[tt] == kOnMg * Mg[tt] * DMn[tt] - kOffMg * MgDMn[tt]
 }
;

(*fast uncaging fraction of DMn*)
BufferDMf := {

  DMf[0] == DMf0,
  CaDMf[0] == CaDMf0,
  MgDMf[0] == MgDMf0,

  DMf'[tt] == -kOnDM * Ca[tt] * DMf[tt] + kOffDM * CaDMf[tt] - kOnMg * Mg[tt] *
     DMf[tt] + kOffMg * MgDMf[tt] - 1 / tauf * DMf[tt] * UnitStep[tt - tflash],
  CaDMf'[tt] == kOnDM * Ca[tt] * DMf[tt] - kOffDM * CaDMf[tt] -
    1 / tauf * CaDMf[tt] * UnitStep[tt - tflash],
  MgDMf'[tt] == kOnMg * Mg[tt] * DMf[tt] - kOffMg * MgDMf[tt] -
    1 / tauf * MgDMf[tt] * UnitStep[tt - tflash]
 }

;
(*slow uncaging fraction of DMn*)
BufferDMs := {

  DMs[0] == DMs0,
  CaDMs[0] == CaDMs0,
  MgDMs[0] == MgDMs0,

  DMs'[tt] == -kOnDM * Ca[tt] * DMs[tt] + kOffDM * CaDMs[tt] - kOnMg * Mg[tt] *
     DMs[tt] + kOffMg * MgDMs[tt] - 1 / taus * DMs[tt] * UnitStep[tt - tflash],
  CaDMs'[tt] == kOnDM * Ca[tt] * DMs[tt] - kOffDM * CaDMs[tt] -
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],
  MgDMs'[tt] == kOnMg * Mg[tt] * DMs[tt] - kOffMg * MgDMs[tt] -
    1 / taus * MgDMs[tt] * UnitStep[tt - tflash]
 }
```

```
;

(*Photoproducts*)
(*PP2: comes from DMf,DMs and MgDMf,MgDMs; but also binds Ca*)
BufferPP2 := {

  PP2[0] == 0,
  CaPP2[0] == 0,
  MgPP2[0] == 0,

  PP2'[tt] == -kOnPP2 * Ca[tt] * PP2[tt] + kOffPP2 * CaPP2[tt] -
    kOnMg * Mg[tt] * PP2[tt] + kOffMgPP * MgPP2[tt] + 2 * (1 / tauf * DMf[tt] *
        UnitStep[tt - tflash] + 1 / taus * DMs[tt] * UnitStep[tt - tflash])
    + 1 / tauf * MgDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * MgDMs[tt] * UnitStep[tt - tflash],

  CaPP2'[tt] == kOnPP2 * Ca[tt] * PP2[tt] - kOffPP2 * CaPP2[tt],

  MgPP2'[tt] == kOnMg * Mg[tt] * PP2[tt] - kOffMgPP * MgPP2[tt] + 1 / tauf *
     MgDMf[tt] * UnitStep[tt - tflash] + 1 / taus * MgDMs[tt] * UnitStep[tt - tflash]
 }
;

(*PP1: Comes from CaDMf,CaDMs and binds Ca and Mg*)
BufferPP1 := {

  PP1[0] == 0,
  CaPP1[0] == 0,
  MgPP1[0] == 0,

  PP1'[tt] == -kOnPP1 * Ca[tt] * PP1[tt] +
    kOffPP1 * CaPP1[tt] - kOnMg * Mg[tt] * PP1[tt] + kOffMgPP * MgPP1[tt]
    + 1 / tauf * CaDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],

  CaPP1'[tt] == kOnPP1 * Ca[tt] * PP1[tt] -
    kOffPP1 * CaPP1[tt] + 1 / tauf * CaDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],

  MgPP1'[tt] == kOnMg * Mg[tt] * PP1[tt] - kOffMgPP * MgPP1[tt]

 }
;

(*Endogeneous Buffer*)
BufferMB := {
```

```
    MB[0] == MB0,
    CaMB[0] == CaMB0,

    MB'[tt] == -kOnMB * Ca[tt] * MB[tt] + kOffMB * CaMB[tt],
    CaMB'[tt] == kOnMB * Ca[tt] * MB[tt] - kOffMB * CaMB[tt]}

  ;

(*Clear[Eqns,Vars,sol]*)

  (*Free Ca*)
  FreeCa := {
    Ca[0] == Ca0,

    Ca'[tt] == -γ * (Ca[tt] - CaRest)
      (*DMn*)
      - kOnPP1 * Ca[tt] * PP1[tt] + kOffPP1 * CaPP1[tt]
      - kOnPP2 * Ca[tt] * PP2[tt] + kOffPP2 * CaPP2[tt]
      - kOnDM * Ca[tt] * DMn[tt] + kOffDM * CaDMn[tt]
      - kOnDM * Ca[tt] * DMf[tt] + kOffDM * CaDMf[tt]
      - kOnDM * Ca[tt] * DMs[tt] + kOffDM * CaDMs[tt]
      (*buffers*)
      - kOnATP * Ca[tt] * ATP[tt] + kOffATP * CaATP[tt]
      - kOnMB * Ca[tt] * MB[tt] + kOffMB * CaMB[tt]
      (*dye*)
      - kOnOG * Ca[tt] * OG[tt] + kOffOG * CaOG[tt]
    }
  ;

  (*Free Mg*)
  FreeMg := {
    Mg[0] == Mg0,

    Mg'[tt] ==
     -kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt]
      - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt]
      - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt]
      - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt]
      - kOnMg * Mg[tt] * PP2[tt] + kOffMgPP * MgPP2[tt]
      - kOnMg * Mg[tt] * PP1[tt] + kOffMgPP * MgPP1[tt]
   }

  ;

  Eqns := {BufferDMn, BufferDMf, BufferDMs, BufferATP,
    BufferPP1, BufferPP2, FreeCa, FreeMg, BufferMB, BufferOG}
  ;
```

```
  Vars := {ATP, CaATP, MgATP, Ca, Mg, CaDMn, DMn, CaDMf, DMf, CaDMs,
    DMs, CaPP1, PP1, CaPP2, PP2, MgPP2, MgPP1, MB, CaMB, OG, CaOG}
  ;
  sol := NDSolve[Eqns, Vars, {tt, 0., TimeWindow}
    (*,Method→{"EquationSimplification"->"Solve"}*)]
  ;
  CafP = Extract[Ca[TimeWindow] /. sol, 1];
  CafOG = KdOG * CaOG[tt] / OG[tt];

  AppendTo[CaListReal, Evaluate[{Ca[tt]} /. sol]];
  AppendTo[CaListDye, Evaluate[{CafOG} /. sol]];

 ];
```

# 10 mM DMN

## general parameters

In[203]:=
```
TimeWindow = 0.006; (*End of simulation*)
tflash = 0.0;  (*Time of flash*)
PlStart = 0.; (*Plot start*)

af = 0.67; (*fast uncaging fraction; Faas et al*)

(*Select dye*)
OGB1 = 0;
OGB5N = 1;
OGB6F = 0;
Fluo5F = 0;

CaRest = 227. * 10^-9; (*Free pre-flash rersting Ca;
equilibrates with all buffers and DM*)
MgT = 0.5 * 10^-3; (*total Mg in pipette*)
γ = 0.; (*Pump rate*)

(*Concentrations of dye, buffers, DM*)
OGtotal = 200. * 10^-6 ;
ATPtotal = 5. * 10^-3 ;
MBtotal = 480. * 10^-6 ;(*(*Delvendahl, PNAS, 2015*)*)

DMT = 10. * 10^-3;  (*total concentration of DMn *)
(*uncaging efficiency*)
aStartDMN10 = 0.14;
aEndDMN10 = 0.25;
```

# definitions and loop

In[220]:=
```
(*Dye*)
If[OGB1 == 1,
 kOnOG  = 4.3 * 10^8;
kOffOG = 103.;]

If[OGB5N == 1,
 kOnOG  = 2.5 * 10^8;
kOffOG = 6000. * 31.4 / 24;]

If[OGB6F == 1,
 kOnOG  = 3. * 10^8;
kOffOG = 900.;]

If[Fluo5F == 1,
 kOnOG  = 3. * 10^8;
kOffOG = 249.;] (*Delvendahl PNAS; before: 432*)

KdOG = kOffOG / kOnOG;
kappaOG = OGtotal / KdOG;

(*ATP*)
kOnATP  = 5. * 10^8;
kOffATP = 100 000.;
kOnMgATP  = 1. * 10^7; (*Bollmann Dissertation S. 59; *)
kOffMgATP = 1000.;

KdATP = kOffATP / kOnATP;
kappaATP = ATPtotal / KdATP;
KdMgATP = kOffMgATP / kOnMgATP;

(*DM*)
If[MgT == 0.,
 kOnDM = 1.98 * 10^7; (*Faas Plos Biol, 2007*)
kOffDM = 0.14;
 ,
 kOnDM = 2.9 * 10^7; (*Faas Biophys J, 2005*)
kOffDM = 0.19;
]

(*Mg binding constants for DMn, DMf, DMs*)
kOnMg = 1.3 * 10^5; (*all values for Mg are from Faas et al., 2005*)
kOffMg = 0.2;
```

```
(*Ca binding constants for PP*)
kOnPP2 = kOnPP1 = kOnDM;
kOffPP2 = 3.6 * 10 ^ 3;
If[MgT == 0.,
 kOffPP1 = 7. * 10 ^ 4;,
 kOffPP1 = 6.9 * 10 ^ 4; ]

(*Mg binding constants for PP1,PP2*)
kOffMgPP = 3. * 10 ^ 2; (*for PP1,PP2*)
konMgPP = kOnMg; (*koMgPP not used in below diff. eq., only kOnMg*)

(*Equilibrium constants (not complete)*)
KdDM = kOffDM / kOnDM;
KdPP1 = kOffPP1 / kOnPP1;
KdMg = kOffMg / kOnMg;
kappaDM = DMT / KdDM;

 (*Endogenous buffer*)
kOnMB = 5 * 10^8;(*Delvendahl, PNAS, 2015*)
kOffMB = 16 000;
KdMB = kOffMB / kOnMB;

TRest = 1000.;


(*----------------------------------  Loop  ----------
 ----------------------------------------*)
(*----------------------------------  Loop  ----------
 ----------------------------------------*)
(*----------------------------------  Loop  ----------
 ----------------------------------------*)

For[aCount = 1, aCount ≤ aNumberDMN10, aCount += 1,
  a = 10 ^ (Log10[aStartDMN10] +
      (aCount - 1) * (Log10[aEndDMN10] - Log10[aStartDMN10]) / (aNumberDMN10 - 1));

  (*------------------------- Resting
    Equations -------------------------------------------*)

  (*Dye*)
  OGRest := {

    OG[0] == OGtotal,
    CaOG[0] == 0,

    OG'[tt] == -kOnOG * CaRest * OG[tt] + kOffOG * CaOG[tt],
    CaOG'[tt] == kOnOG * CaRest * OG[tt] - kOffOG * CaOG[tt]
```

```
 }
;

(*ATP*)
ATPRest := {

  ATP[0] == ATPtotal,
  CaATP[0] == 0,
  MgATP[0] == 0,

  ATP'[tt] == -kOnATP * CaRest * ATP[tt] + kOffATP * CaATP[tt] -
    kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt],
  CaATP'[tt] == kOnATP * CaRest * ATP[tt] - kOffATP * CaATP[tt],
  MgATP'[tt] == kOnMgATP * Mg[tt] * ATP[tt] - kOffMgATP * MgATP[tt]

 }

;

(*DM nitrophene*)
DMnRest := {

  DMn[0] == (1 - a) * DMT,
  CaDMn[0] == 0.,
  MgDMn[0] == 0.,

  DMn'[tt] == -kOnDM * CaRest * DMn[tt] +
    kOffDM * CaDMn[tt] - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt],
  CaDMn'[tt] == kOnDM * CaRest * DMn[tt] - kOffDM * CaDMn[tt],
  MgDMn'[tt] == kOnMg * Mg[tt] * DMn[tt] - kOffMg * MgDMn[tt]
 }

;
DMfRest := {

  DMf[0] == a * af * DMT,
  CaDMf[0] == 0.,
  MgDMf[0] == 0.,

  DMf'[tt] == -kOnDM * CaRest * DMf[tt] +
    kOffDM * CaDMf[tt] - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt],
  CaDMf'[tt] == kOnDM * CaRest * DMf[tt] - kOffDM * CaDMf[tt],
  MgDMf'[tt] == kOnMg * Mg[tt] * DMf[tt] - kOffMg * MgDMf[tt]
 }

;
DMsRest := {
```

```
  DMs[0] == a * (1 - af) * DMT,
  CaDMs[0] == 0.,
  MgDMs[0] == 0.,

  DMs'[tt] == -kOnDM * CaRest * DMs[tt] +
    kOffDM * CaDMs[tt] - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt],
  CaDMs'[tt] == kOnDM * CaRest * DMs[tt] - kOffDM * CaDMs[tt],
  MgDMs'[tt] == kOnMg * Mg[tt] * DMs[tt] - kOffMg * MgDMs[tt]
 }
;

(*Endogeneous buffer*)
MBRest := {

  MB[0] == MBtotal,
  CaMB[0] == 0,

  MB'[tt] == -kOnMB * CaRest * MB[tt] + kOffMB * CaMB[tt],
  CaMB'[tt] == kOnMB * CaRest * MB[tt] - kOffMB * CaMB[tt]
 }

;

(*Free Mg*)
MgfRest := {
  Mg[0] == MgT,

  Mg'[tt] ==
   -kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt]
    - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt]
    - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt]
    - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt]
 }

;
EqRest := {ATPRest, MgfRest, OGRest, DMnRest, DMfRest, DMsRest, MBRest};
VarsRest := {ATP, Mg, CaATP, MgATP, CaOG, OG, DMn,
  CaDMn, MgDMn, DMf, CaDMf, MgDMf, DMs, CaDMs, MgDMs, MB, CaMB}
;
solr := NDSolve[EqRest, VarsRest, {tt, 0, TRest}]
;

Ca0 = CaRest;
Mg0 = Extract[Mg[TRest] /. solr, 1];
ATP0 = Extract[ATP[TRest] /. solr, 1];
CaATP0 = Extract[CaATP[TRest] /. solr, 1];
```

```
MgATP0 = Extract[MgATP[TRest] /. solr, 1];
OG0 = Extract[OG[TRest] /. solr, 1];
CaOG0 = Extract[CaOG[TRest] /. solr, 1];
DMn0 = Extract[DMn[TRest] /. solr, 1];
CaDMn0 = Extract[CaDMn[TRest] /. solr, 1];
MgDMn0 = Extract[MgDMn[TRest] /. solr, 1];
DMf0 = Extract[DMf[TRest] /. solr, 1];
CaDMf0 = Extract[CaDMf[TRest] /. solr, 1];
MgDMf0 = Extract[MgDMf[TRest] /. solr, 1];
DMs0 = Extract[DMs[TRest] /. solr, 1];
CaDMs0 = Extract[CaDMs[TRest] /. solr, 1];
MgDMs0 = Extract[MgDMs[TRest] /. solr, 1];
MB0 = Extract[MB[TRest] /. solr, 1];
CaMB0 = Extract[CaMB[TRest] /. solr, 1];


ClearAll[EqRest, VarsRest];


(*------------------------- Flash
  Equations -------------------------------------------*)

(*Dye*)
BufferOG := {

  OG[0] == OG0,
  CaOG[0] == CaOG0,

  OG'[tt] == -kOnOG * Ca[tt] * OG[tt] + kOffOG * CaOG[tt],
  CaOG'[tt] == kOnOG * Ca[tt] * OG[tt] - kOffOG * CaOG[tt]}
;

(*ATP*)
BufferATP := {

  ATP[0] == ATP0,
  CaATP[0] == CaATP0,
  MgATP[0] == MgATP0,

  ATP'[tt] == -kOnATP * Ca[tt] * ATP[tt] + kOffATP * CaATP[tt] -
    kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt],
  CaATP'[tt] == kOnATP * Ca[tt] * ATP[tt] - kOffATP * CaATP[tt],
  MgATP'[tt] == kOnMgATP * Mg[tt] * ATP[tt] - kOffMgATP * MgATP[tt]
 }
;

(*fast (tauf) and slow (taus) time constants for uncageing;
```

```
  Faas et al., 2005,2007*)
If[MgT == 0.,
   tauf = 15.2 * 10^-6;  (*Faas, 2007*)
   taus = 1.9 * 10^-3;
   ,
   tauf = 15. * 10^-6;  (*Faas,2005*)
   taus = 2. * 10^-3; ]

  ;

  (*The differential equations*)
  (*non uncaging fraction of DMn*)
  BufferDMn := {

    DMn[0] == DMn0,
    CaDMn[0] == CaDMn0,
    MgDMn[0] == MgDMn0,

    DMn'[tt] == -kOnDM * Ca[tt] * DMn[tt] +
      kOffDM * CaDMn[tt] - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt],
    CaDMn'[tt] == kOnDM * Ca[tt] * DMn[tt] - kOffDM * CaDMn[tt],
    MgDMn'[tt] == kOnMg * Mg[tt] * DMn[tt] - kOffMg * MgDMn[tt]
   }
  ;

  (*fast uncaging fraction of DMn*)
  BufferDMf := {

    DMf[0] == DMf0,
    CaDMf[0] == CaDMf0,
    MgDMf[0] == MgDMf0,

    DMf'[tt] == -kOnDM * Ca[tt] * DMf[tt] + kOffDM * CaDMf[tt] - kOnMg * Mg[tt] *
       DMf[tt] + kOffMg * MgDMf[tt] - 1 / tauf * DMf[tt] * UnitStep[tt - tflash],
    CaDMf'[tt] == kOnDM * Ca[tt] * DMf[tt] - kOffDM * CaDMf[tt] -
      1 / tauf * CaDMf[tt] * UnitStep[tt - tflash],
    MgDMf'[tt] == kOnMg * Mg[tt] * DMf[tt] - kOffMg * MgDMf[tt] -
      1 / tauf * MgDMf[tt] * UnitStep[tt - tflash]
   }

  ;
  (*slow uncaging fraction of DMn*)
  BufferDMs := {

    DMs[0] == DMs0,
    CaDMs[0] == CaDMs0,
    MgDMs[0] == MgDMs0,
```

```
  DMs'[tt] == -kOnDM * Ca[tt] * DMs[tt] + kOffDM * CaDMs[tt] - kOnMg * Mg[tt] *
     DMs[tt] + kOffMg * MgDMs[tt] - 1 / taus * DMs[tt] * UnitStep[tt - tflash],
  CaDMs'[tt] == kOnDM * Ca[tt] * DMs[tt] - kOffDM * CaDMs[tt] -
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],
  MgDMs'[tt] == kOnMg * Mg[tt] * DMs[tt] - kOffMg * MgDMs[tt] -
    1 / taus * MgDMs[tt] * UnitStep[tt - tflash]
 }
;

(*Photoproducts*)
(*PP2: comes from DMf,DMs and MgDMf,MgDMs; but also binds Ca*)
BufferPP2 := {

  PP2[0] == 0,
  CaPP2[0] == 0,
  MgPP2[0] == 0,

  PP2'[tt] == -kOnPP2 * Ca[tt] * PP2[tt] + kOffPP2 * CaPP2[tt] -
    kOnMg * Mg[tt] * PP2[tt] + kOffMgPP * MgPP2[tt] + 2 * (1 / tauf * DMf[tt] *
        UnitStep[tt - tflash] + 1 / taus * DMs[tt] * UnitStep[tt - tflash])
    + 1 / tauf * MgDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * MgDMs[tt] * UnitStep[tt - tflash],

  CaPP2'[tt] == kOnPP2 * Ca[tt] * PP2[tt] - kOffPP2 * CaPP2[tt],

  MgPP2'[tt] == kOnMg * Mg[tt] * PP2[tt] - kOffMgPP * MgPP2[tt] + 1 / tauf *
     MgDMf[tt] * UnitStep[tt - tflash] + 1 / taus * MgDMs[tt] * UnitStep[tt - tflash]
 }
;

(*PP1: Comes from CaDMf,CaDMs and binds Ca and Mg*)
BufferPP1 := {

  PP1[0] == 0,
  CaPP1[0] == 0,
  MgPP1[0] == 0,

  PP1'[tt] == -kOnPP1 * Ca[tt] * PP1[tt] +
    kOffPP1 * CaPP1[tt] - kOnMg * Mg[tt] * PP1[tt] + kOffMgPP * MgPP1[tt]
    + 1 / tauf * CaDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],

  CaPP1'[tt] == kOnPP1 * Ca[tt] * PP1[tt] -
    kOffPP1 * CaPP1[tt] + 1 / tauf * CaDMf[tt] * UnitStep[tt - tflash] +
    1 / taus * CaDMs[tt] * UnitStep[tt - tflash],
```

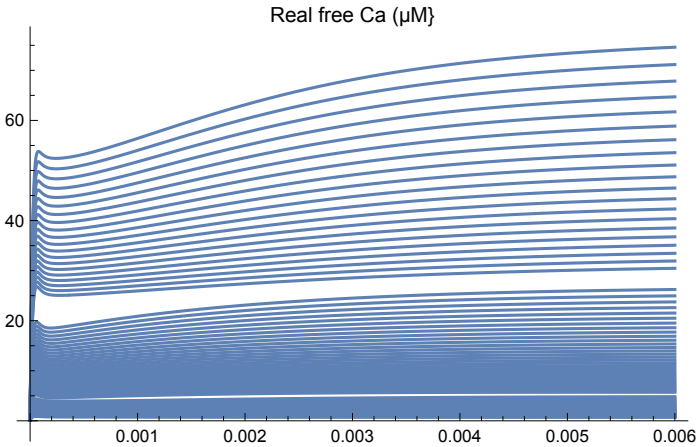
```
    MgPP1'[tt] == kOnMg * Mg[tt] * PP1[tt] - kOffMgPP * MgPP1[tt]

   }
  ;

  (*Endogeneous Buffer*)
  BufferMB := {

    MB[0] == MB0,
    CaMB[0] == CaMB0,

    MB'[tt] == -kOnMB * Ca[tt] * MB[tt] + kOffMB * CaMB[tt],
    CaMB'[tt] == kOnMB * Ca[tt] * MB[tt] - kOffMB * CaMB[tt]}

  ;

(*Clear[Eqns,Vars,sol]*)

  (*Free Ca*)
  FreeCa := {
    Ca[0] == Ca0,

    Ca'[tt] == -γ * (Ca[tt] - CaRest)
      (*DMn*)
      - kOnPP1 * Ca[tt] * PP1[tt] + kOffPP1 * CaPP1[tt]
      - kOnPP2 * Ca[tt] * PP2[tt] + kOffPP2 * CaPP2[tt]
      - kOnDM * Ca[tt] * DMn[tt] + kOffDM * CaDMn[tt]
      - kOnDM * Ca[tt] * DMf[tt] + kOffDM * CaDMf[tt]
      - kOnDM * Ca[tt] * DMs[tt] + kOffDM * CaDMs[tt]
      (*buffers*)
      - kOnATP * Ca[tt] * ATP[tt] + kOffATP * CaATP[tt]
      - kOnMB * Ca[tt] * MB[tt] + kOffMB * CaMB[tt]
      (*dye*)
      - kOnOG * Ca[tt] * OG[tt] + kOffOG * CaOG[tt]
    }
  ;

  (*Free Mg*)
  FreeMg := {
    Mg[0] == Mg0,

    Mg'[tt] ==
     -kOnMgATP * Mg[tt] * ATP[tt] + kOffMgATP * MgATP[tt]
      - kOnMg * Mg[tt] * DMn[tt] + kOffMg * MgDMn[tt]
      - kOnMg * Mg[tt] * DMf[tt] + kOffMg * MgDMf[tt]
      - kOnMg * Mg[tt] * DMs[tt] + kOffMg * MgDMs[tt]
      - kOnMg * Mg[tt] * PP2[tt] + kOffMgPP * MgPP2[tt]
```

```
        - kOnMg * Mg[tt] * PP1[tt] + kOffMgPP * MgPP1[tt]
    }

  ;

  Eqns := {BufferDMn, BufferDMf, BufferDMs, BufferATP,
    BufferPP1, BufferPP2, FreeCa, FreeMg, BufferMB, BufferOG}
  ;
  Vars := {ATP, CaATP, MgATP, Ca, Mg, CaDMn, DMn, CaDMf, DMf, CaDMs,
    DMs, CaPP1, PP1, CaPP2, PP2, MgPP2, MgPP1, MB, CaMB, OG, CaOG}
  ;
  sol := NDSolve[Eqns, Vars, {tt, 0., TimeWindow}
    (*,Method→{"EquationSimplification"->"Solve"}*)]
  ;
  CafP = Extract[Ca[TimeWindow] /. sol, 1];
  CafOG = KdOG * CaOG[tt] / OG[tt];


  AppendTo[CaListReal, Evaluate[{Ca[tt]} /. sol]];
  AppendTo[CaListDye, Evaluate[{CafOG} /. sol]];
 ];
```

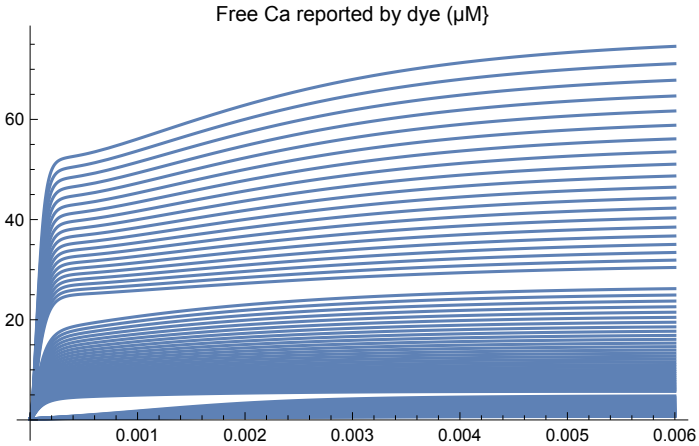
# Plot and further processing

```
In[250]:= Plot[10^6 * CaListReal, {tt, 0, TimeWindow}, PlotLabel → "Real free Ca (μM}"]
Plot[10^6 * CaListDye, {tt, 0, TimeWindow},
 PlotLabel → "Free Ca reported by dye (μM}"]
LogPlot[10^6 * CaListReal, {tt, 0, TimeWindow}, PlotLabel → "Real free Ca (μM}"]
LogPlot[10^6 * CaListDye, {tt, 0, TimeWindow},
 PlotLabel → "Free Ca reported by dye (μM}"]
CaListDyePeak =
 Table[NMaximize[{CaListDye[[nn]][[1]][[1]], 0 ≤ tt ≤ TimeWindow}, tt][[1]],
  {nn, Length[CaListDye]}]
  (*"[[1]][[1]]" is neede to get rid of these brackets {{}}*)
```

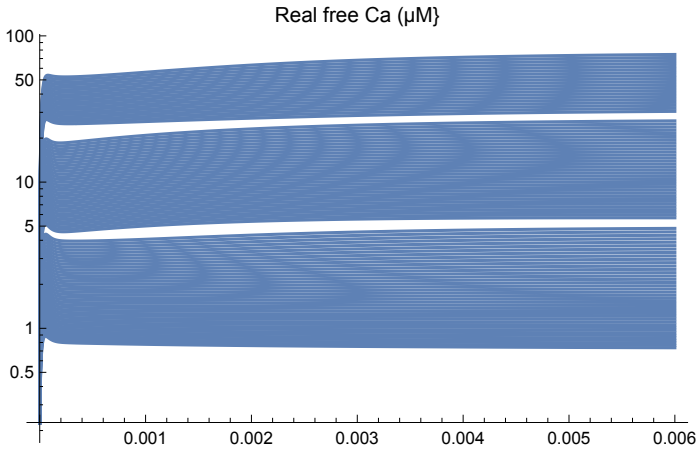
Out[250]=



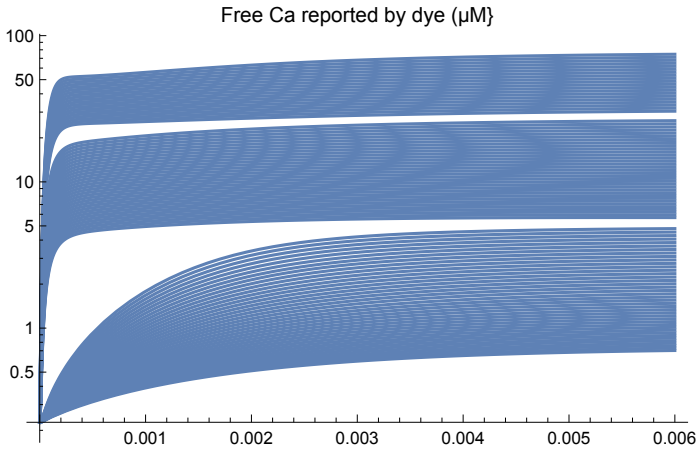

Out[251]=




Out[252]=



Out[253]=




Out[254]= $\{7.03073\times10^{-7}, 7.29825\times10^{-7}, 7.58204\times10^{-7}, 7.88054\times10^{-7},$
$8.20427\times10^{-7}, 8.54404\times10^{-7}, 8.90526\times10^{-7}, 9.28936\times10^{-7}, 9.68962\times10^{-7},$
$1.01226\times10^{-6}, 1.05883\times10^{-6}, 1.10833\times10^{-6}, 1.16077\times10^{-6}, 1.21664\times10^{-6},$
$1.27589\times10^{-6}, 1.33895\times10^{-6}, 1.40597\times10^{-6}, 1.47745\times10^{-6}, 1.55324\times10^{-6},$
$1.63202\times10^{-6}, 1.71772\times10^{-6}, 1.81058\times10^{-6}, 1.90732\times10^{-6}, 2.01009\times10^{-6},$
$2.11924\times10^{-6}, 2.23489\times10^{-6}, 2.35773\times10^{-6}, 2.48791\times10^{-6}, 2.62605\times10^{-6},$
$2.77177\times10^{-6}, 2.92648\times10^{-6}, 3.0905\times10^{-6}, 3.26357\times10^{-6}, 3.44741\times10^{-6},$
$3.64088\times10^{-6}, 3.84593\times10^{-6}, 4.06272\times10^{-6}, 4.29254\times10^{-6}, 4.53549\times10^{-6},$
$4.79194\times10^{-6}, 5.70182\times10^{-6}, 5.94854\times10^{-6}, 6.20769\times10^{-6}, 6.48003\times10^{-6},$
$6.76619\times10^{-6}, 7.06711\times10^{-6}, 7.38317\times10^{-6}, 7.71513\times10^{-6}, 8.06387\times10^{-6},$
$8.43035\times10^{-6}, 8.8155\times10^{-6}, 9.22041\times10^{-6}, 9.64607\times10^{-6}, 0.0000100938,$
0.0000105647, 0.0000110598, 0.0000115813, 0.0000121299, 0.0000127076,
0.0000133154, 0.0000139549, 0.00001463, 0.0000153404, 0.0000160887,
0.0000168774, 0.0000177084, 0.0000185844, 0.0000195079, 0.0000204816,
0.0000215084, 0.0000225913, 0.0000237336, 0.000024939, 0.0000262105,
0.0000304385, 0.0000319006, 0.0000334338, 0.0000350413, 0.000036727,
0.0000384944, 0.0000403477, 0.0000422911, 0.0000443291, 0.0000464665,
0.0000487083, 0.0000510599, 0.0000535266, 0.0000561157, 0.0000588318,
0.0000616839, 0.0000646772, 0.0000678199, 0.0000711201, 0.0000745861}

In[255]:=
```
runs = Length[CaListDyePeak];
```

# Release scheme and parameters

## Define release scheme

In[256]:=
```
nStates = 4;
mat = Table[0, {nStates}, {nStates}];
```

## forward rates

In[258]:=
```
from = 1;(*0 ca bound to 1 ca bound*)
kk = 2 kon;
mat[[from + 1, from]] += kk; mat[[from, from]] += -kk;

from = 2;(*1 ca bound to 2 ca bound*)
kk = 1 kon;
mat[[from + 1, from]] += kk; mat[[from, from]] += -kk;

from = 3;(*from 2 ca bound to fused*)
kk = gamma;
mat[[from + 1, from]] += kk; mat[[from, from]] += -kk;
```

## backwards rates

In[267]:=
```
from = 2;(*1 ca bound to 0 ca bound*)
kk = koff b^0;
mat[[from - 1, from]] += kk; mat[[from, from]] += -kk;

from = 3;(*2 ca bound to 1 ca bound*)
kk = 2 koff b^1;
mat[[from - 1, from]] += kk; mat[[from, from]] += -kk;
```

## outflux from matrix

In[273]:=
```
mat[[1, 1]] += -kunprim;
```

## influx in matrix

In[274]:=
```
mat[[1, 1]] += kprim / ss1[t];
```

## Matrix

In[275]:=
```
mat // TableForm
```

Out[275]//TableForm=

| | | | |
|---|---|---|---|
| $-2\,\text{kon} - \text{kunprim} + \frac{\text{kprim}}{\text{ss1}[t]}$ | koff | 0 | 0 |
| 2 kon | $-\text{koff} - \text{kon}$ | 2 b koff | 0 |
| 0 | kon | $-\text{gamma} - 2\,\text{b koff}$ | 0 |
| 0 | 0 | gamma | 0 |

# Parameters of release scheme

In[276]:=
```
q10 = 2.3;
tempFact = q10^((37 - 24) / 10);
```

In[278]:=
```
Clear[caFunc, kprimScheme];
(*Clear is needed if the cell is exectued for a 2nd time when
 caFunc is already set to a value or an Interpolationfunction*)

caRest = CaRest;(*227nM see above*)

affinityFactor = 1.0;
konScheme = 100. * caFunc[t] Sqrt[affinityFactor] tempFact 1.*^7;(*M^-1 s^-1*)
koffScheme = 100. * (1 / Sqrt[affinityFactor]) tempFact 1500;(*s^-1*)
gammaScheme = 10. * tempFact 6000;(*s^-1*)
bScheme = 0.25;


KdPrim = 2.*^-6;
kprimScheme = 0.6 + 30. (caFunc[t] / (KdPrim + caFunc[t]));
kunprimScheme = 0.6 + 30. (caRest / (KdPrim + caRest));


repl = {
   kon → konScheme,
   koff → koffScheme ,
   gamma → gammaScheme ,
    b → bScheme,

   kprim → kprimScheme ,
   kunprim → kunprimScheme

  };
```

In[289]:=
```
tauOfDecayOfUncagedCa = 0.4;
```

# Initial occupancy

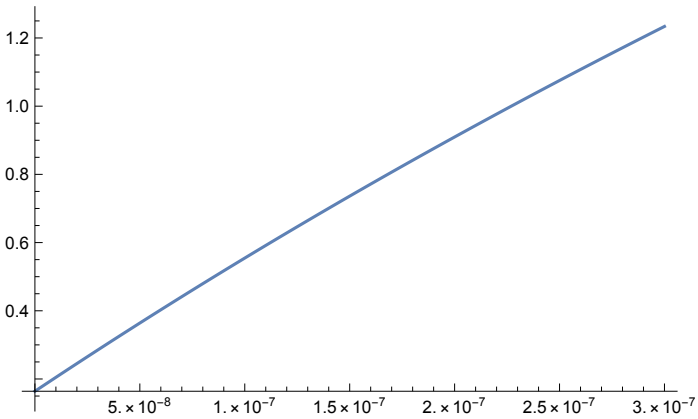
In[290]:=
```
(*test initial equilibrium occupancy*)
caFunc[t_] := caTmp;
fillStateSSInitial = kprimScheme / kunprimScheme;
ss0Initial = fillStateSSInitial;
(ss0Initial /. caTmp → 180*^-9)
(ss0Initial /. caTmp → 30*^-9)
(ss0Initial /. caTmp → 180*^-9) / (ss0Initial /. caTmp → 30*^-9)
(*test initial *)
Plot[kprimScheme / kunprimScheme, {caTmp, 0, 300*^-9}]
```

Out[293]= 0.841205

Out[294]= 0.28523

Out[295]= 2.94922

Out[296]=




In[297]:=
```
(*calualte initial equilibrium occupancy*)
caFunc[t_] := caRest;
kprimScheme
kunprimScheme
ss0Initial = kprimScheme / kunprimScheme
```

Out[298]= 3.65793

Out[299]= 3.65793

Out[300]= 1.

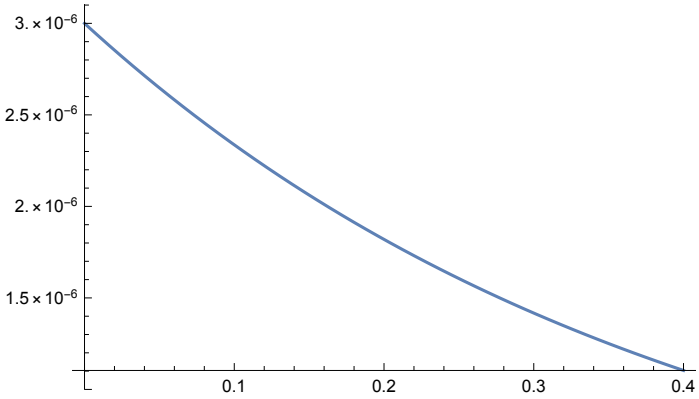
# Diff eq.

In[301]:=
```
Clear[caFunc, eq];(*Clear is needed if the cell is exectued for a 2nd time
 when caFunc is already set to a value or an Interpolationfunction*)
ss[t_] = {ss1[t], ss2[t], ss3[t], ss4[t]};
eq = {ss'[t] == (mat /. repl).ss[t],
   ss[0] == {ss0Initial, 0, 0, 0}};
```

# Solve all states

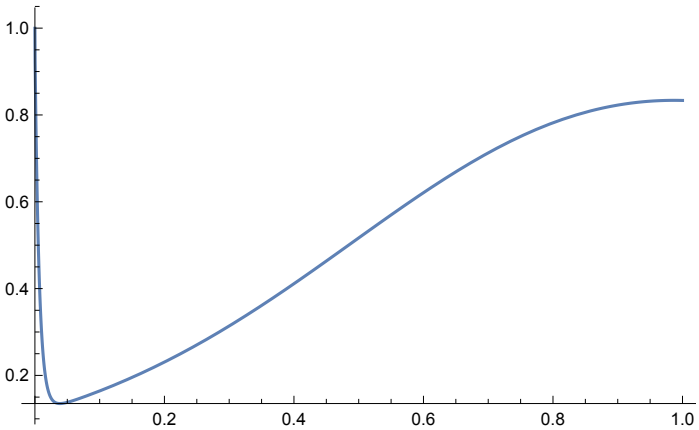
In[304]:=
```
caFunc[t_] := 3*^-6 * Exp[-t / tauOfDecayOfUncagedCa];;
Plot[caFunc[t], {t, 0, 0.4}, PlotRange → All]
```

Out[305]=

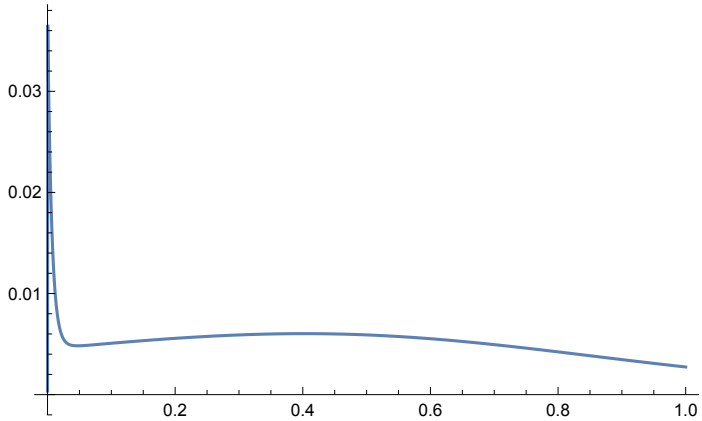



In[306]:=
```
myNDSolveResults = NDSolve[eq, {ss1, ss2, ss3, ss4}, {t, 0, 10.}];
tEndForPlot = 1.;
Plot[(ss1[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
Plot[(ss2[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
Plot[(ss3[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
Plot[(ss4[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
```

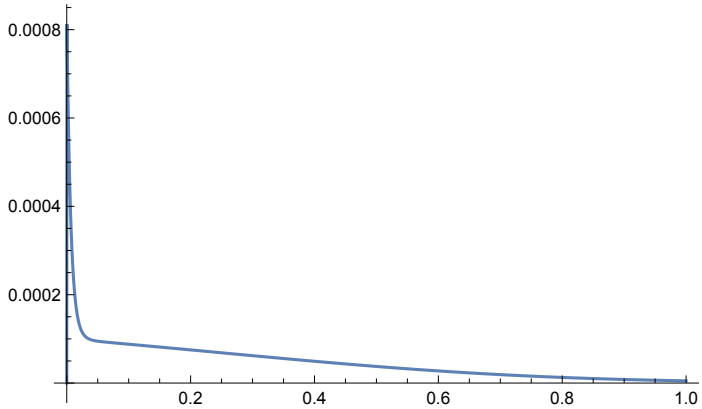
Out[308]=



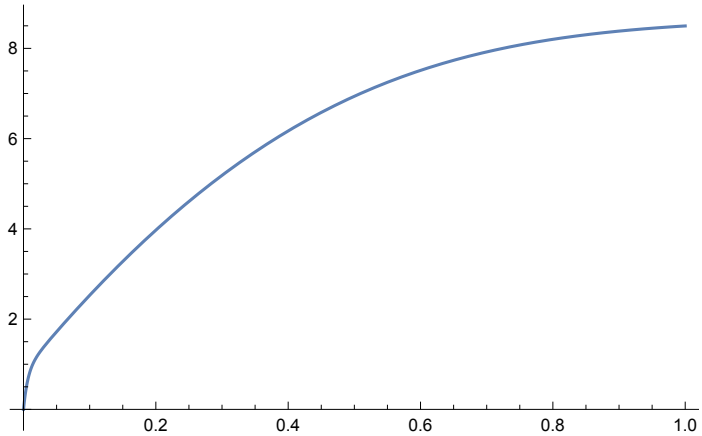
Out[309]=




Out[310]=




Out[311]=




# Loop

## make lists for later

In[312]:=
```
simCaList = Table[0, {runs}];
simParamNv = Table[0, {7}, {runs}];
```

### C5

In[314]:=
```
baselineC5 = Table[{ttt, 0}, {ttt, cursorStart, -1*^-6, dtOfDataC5}];
(*Lists for saving data within loop*)
simParamNoiseC5 = Table[0, {numberOfFitParamToBeSaved}, {noiseRepeats}];
simParamMedianC5 = Table[0, {numberOfFitParamToBeSaved}, {runs}];
simParamQuantile1C5 = Table[0, {numberOfFitParamToBeSaved}, {runs}];
simParamQuantile2C5 = Table[0, {numberOfFitParamToBeSaved}, {runs}];
```

### C10

In[319]:=
```
baselineC10 = Table[{ttt, 0}, {ttt, cursorStart, -1*^-6, dtOfDataC10}];
(*Lists for saving data within loop*)
simParamNoiseC10 = Table[0, {numberOfFitParamToBeSaved}, {noiseRepeats}];
simParamMedianC10 = Table[0, {numberOfFitParamToBeSaved}, {runs}];
simParamQuantile1C10 = Table[0, {numberOfFitParamToBeSaved}, {runs}];
simParamQuantile2C10 = Table[0, {numberOfFitParamToBeSaved}, {runs}];
```

### D

In[324]:=
```
baselineD = Table[{ttt, 0}, {ttt, cursorStart, -1*^-6, dtOfDataD}];
(*Lists for saving data within loop*)
simParamNoiseD = Table[0, {numberOfFitParamToBeSaved}, {noiseRepeats}];
simParamMedianD = Table[0, {numberOfFitParamToBeSaved}, {runs}];
simParamQuantile1D = Table[0, {numberOfFitParamToBeSaved}, {runs}];
simParamQuantile2D = Table[0, {numberOfFitParamToBeSaved}, {runs}];
```

### Long

In[329]:=
```
baselineLong = Table[{ttt, 0}, {ttt, -0.05, -1*^-6, dtOfDataLong}];
```

---

# Loop

In[330]:=
```
For[r = 1, r ≤ runs, r += 1,
  myCaNow = CaListDyePeak[[r]];
  lastSimulatedCaListReal = CaListReal[[r]][[1]][[1]] /. tt → TimeWindow;
  (*"[[1]][[1]]" is neede to get rid of these brackets {{}}*)
  Print[
   "-----------------------------------------------------------------------
     -----------------------------------"];
  Print["----------------    Ca = ", 1*^6 myCaNow,
   " uM         -------------------------------------------------------"];
  Print[
   "-----------------------------------------------------------------------
     -----------------------------------"];
  simCaList[[r]] = myCaNow;
```

```
caFunc[ttt_] := If[ttt < TimeWindow,
  CaListReal[[r]][[1]][[1]] /. tt → ttt,
  (*tt because this is the symbol used in "Calculate Ca transients"*)
  lastSimulatedCaListReal * Exp[-ttt / tauOfDecayOfUncagedCa]
 ];
(* solve Diff Eq.: *)
myNDSolveResults = NDSolve[eq, ss4, {t, 0, 0.4}];
(* plot results: *)
fused[t_] := ss4[t];
Plot[(fused[t] /. myNDSolveResults),
  {t, 0, cursorEnd}, PlotRange → All] // Print;
Plot[(fused[t] /. myNDSolveResults), {t, 0, cursorEndLong},
  PlotRange → All] // Print;
If[exportYes == 1,
 toExport = Table[{t, (fused[t] /. myNDSolveResults)[[1]]},
   {t, 0., cursorEndLong, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " withoutNoise.txt", toExport, "Table"];
];
(* sample data and add baseline: --------*)
tmpCumRelC5 = Table[{ttt, (fused[ttt] /. myNDSolveResults)[[1]]},
  {ttt, 0., cursorEnd, dtOfDataC5}];
tmpToFitC5 = Catenate[{baselineC5, tmpCumRelC5}];
tmpCumRelC10 = Table[{ttt, (fused[ttt] /. myNDSolveResults)[[1]]},
  {ttt, 0., cursorEnd, dtOfDataC10}];
tmpToFitC10 = Catenate[{baselineC10, tmpCumRelC10}];
tmpCumRelD = Table[{ttt, (fused[ttt] /. myNDSolveResults)[[1]]},
  {ttt, 0., cursorEnd, dtOfDataD}];
tmpToFitD = Catenate[{baselineD, tmpCumRelD}];
tmpCumRelLong = Table[{ttt, (fused[ttt] /. myNDSolveResults)[[1]]},
  {ttt, 0., cursorEndLong, dtOfDataLong}];
tmpToFitLong = Catenate[{baselineLong, tmpCumRelLong}];

(*---------    get amplitude
  without noise and without fitting -----------------*)
For[NvCount = 1, NvCount ≤ 7, NvCount += 1,
 simParamNv[[NvCount, r]] =
   (fused[timeOfNv[[NvCount]]] /. myNDSolveResults)[[1]];
  (* the [[1]] is somehow needed to get rid of a list structure
  probably related to the interpolate function*)
];

(*--------------   Startvalues for
  fit the same for all C5 C10 and D -------------*)
caAdjustedTau1Guess = tau1Guess / ((myCaNow / 10.*^-6) ^4);
caAdjustedTau1Guess = tau1Guess / ((myCaNow / 10.*^-6) ^1);
```

```
caAdjustedTau2Guess = 10 caAdjustedTau1Guess;
caAdjustedDelayGuess = delayGuess / ((myCaNow / 10.*^-6) ^ 1);

(*---------    Fitting of data,
saving of results, and plotting-----------------*)
(*-----------------------------------------------------------------------
                                        ----*)
(*--------------------------------------    C5     ------------------------
                          ----*)
(*-----------------------------------------------------------------------
                                        ----*)
Print[
 "-----------------------------------------------------------------------
   C5"];
(*check that signal is large enough relative to noise to obtain
 useful fit results. If not, do not do fitting and set everything to {}*)
If[simParamNv[[5, r]] > signalToNoiseRatioC5 myNoiseC5, (*add noise
  and do the fitting several times and then average the results*)
 For[noiseN = 1, noiseN ≤ noiseRepeats, noiseN += 1,
  (*Print[noiseN];*)
  tmpToFitNoise = Transpose[{tmpToFitC5[[All, 1]],
     # + RandomVariate[NormalDistribution[0, myNoiseC5]] & /@
      tmpToFitC5[[All, 2]]}];
  (*fit mono-exp*)
  fitResultsTMP = NonlinearModelFit[tmpToFitNoise, myFitMono[x1],
    {{delayMono, delayGuess}, {ampMono, ampGuess}, {tau1Mono,
      caAdjustedTau1Guess}}, x1, MaxIterations → myMaxIterations];
  fitResultMono = fitResultsTMP[{"BestFitParameters"}];
  simParamNoiseC5[[1, noiseN]] = 0; (*not used anymore*)
  simParamNoiseC5[[2, noiseN]] =
   fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
  (*Print[fitResultsTMP["ANOVATableSumsOfSquares"]];*)
  simParamNoiseC5[[3, noiseN]] = (delayMono /. fitResultMono) [[1]];
  simParamNoiseC5[[4, noiseN]] = ((ampMono /. fitResultMono)) [[1]];
  simParamNoiseC5[[5, noiseN]] = (1 / (tau1Mono /. fitResultMono)) [[1]];
  (*fit bi-exp*)
  fitResultsTMP =
   NonlinearModelFit[tmpToFitNoise, myFitBi[x1], {{delay, delayGuess},
     {amp, ampGuess}, {amp1, amp1Guess}, {tau1, caAdjustedTau1Guess},
     {tau2, caAdjustedTau2Guess}}, x1, MaxIterations → myMaxIterations];
  fitResultBi = fitResultsTMP[{"BestFitParameters"}];
  simParamNoiseC5[[6, noiseN]] = simParamNoiseC5[[2, noiseN]] /
    fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
  simParamNoiseC5[[7, noiseN]] = (delay /. fitResultBi) [[1]];
  simParamNoiseC5[[8, noiseN]] = ((amp /. fitResultBi)) [[1]];
  simParamNoiseC5[[9, noiseN]] = ((amp amp1 /. fitResultBi)) [[1]];
  (*relative amp1*)
```

```
 simParamNoiseC5[[10, noiseN]] = (1 / (tau1 /. fitResultBi))[[1]];
 simParamNoiseC5[[11, noiseN]] = (1 / (tau2 /. fitResultBi))[[1]];
 (*merge*)
 If[
  (*to use the bi-exp fit, the following cirteria should be fullfilled:*)
  (*chi2 should improve(=decrease) by >4%*)
  (simParamNoiseC5[[6, noiseN]] > 1.04)
   &&
   (*tau1 and tau2 of bi fit should be factor of >3 different*)
   ((simParamNoiseC5[[11, noiseN]] / simParamNoiseC5[[10, noiseN]]) < 3.)
   &&
   (*relative amplitude of 1st component should be > 5% *)
   (((amp1 /. fitResultBi))[[1]] > 0.05)
   &&
   (*relative amplitude of 1st component should be < 95% *)
   (((amp1 /. fitResultBi))[[1]] < 0.95)
  ,
  (*take bi*)
  Print["take bi"];
  simParamNoiseC5[[12, noiseN]] = simParamNoiseC5[[7, noiseN]];
  (*delay*)
  simParamNoiseC5[[13, noiseN]] = simParamNoiseC5[[8, noiseN]];
  (*amp*)
  simParamNoiseC5[[14, noiseN]] = simParamNoiseC5[[9, noiseN]];
  (*amp1*)
  simParamNoiseC5[[15, noiseN]] = simParamNoiseC5[[10, noiseN]];
  (*tau1*)
  simParamNoiseC5[[16, noiseN]] = simParamNoiseC5[[11, noiseN]];(*tau2*)
  ,
  (*take mono*)
  Print["take mono"];
  simParamNoiseC5[[12, noiseN]] = simParamNoiseC5[[3, noiseN]];
  (*delay*)
  simParamNoiseC5[[13, noiseN]] = simParamNoiseC5[[4, noiseN]];
  (*amp*)
  simParamNoiseC5[[14, noiseN]] = NaN; (*amp1*)
  simParamNoiseC5[[15, noiseN]] = simParamNoiseC5[[5, noiseN]];
  (*tau1*)
  simParamNoiseC5[[16, noiseN]] = NaN;(*tau2*)
 ];
];
(*plot last example of the noise loop*)
gr1 = ListPlot[tmpToFitNoise, PlotRange → All, PlotStyle → Black];
gr2 = Plot[myFitMono[x1] /. fitResultMono,
  {x1, cursorStart, cursorEnd}, PlotRange → All, PlotStyle → {Blue, Dashed}];
gr3 = Plot[myFitBi[x1] /. fitResultBi, {x1, cursorStart, cursorEnd},
  PlotRange → All, PlotStyle → {Green, Dashed}];
```

```
Show[gr1, gr2, gr3, PlotRange → All ] // Print;
If[exportYes == 1,
 Export["withinLoop r" <> ToString[r] <> " Ca" <>
   ToString[1*^6 myCaNow] <> " C5 data.txt", tmpToFitNoise, "Table"];
 toExport = Table[{t, (myFitMono[t] /. fitResultMono)[[1]]},
   {t, cursorStart, cursorEnd, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C5 fitMono.txt", toExport, "Table"];
 toExport = Table[{t, (myFitBi[t] /. fitResultBi)[[1]]},
   {t, cursorStart, cursorEnd, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <>
   ToString[1*^6 myCaNow] <> " C5 fitBi.txt", toExport, "Table"];
];
noiseN = noiseRepeats; (*fit parameter of last noisetrace*)
Print["Mono: chi2 = ", simParamNoiseC5[[2, noiseN]], "     d = ",
 simParamNoiseC5[[2, noiseN]], "     a = ", simParamNoiseC5[[4, noiseN]],
 "     t = ", 1/simParamNoiseC5[[5, noiseN]]];
Print["Bi: ratio chi2Mono/chi2Bi = ", simParamNoiseC5[[6, noiseN]],
 "     d = ", simParamNoiseC5[[7, noiseN]], "     a = ",
 simParamNoiseC5[[8, noiseN]], "     a1 = ", simParamNoiseC5[[9, noiseN]],
 "     t1 =", 1/simParamNoiseC5[[10, noiseN]],
 "     t2 = ", 1/simParamNoiseC5[[11, noiseN]]];
(*average fit results*)
For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
 simParamMedianC5[[p, r]] =
  Median[simParamNoiseC5[[p, All]] /. NaN → Sequence[]];
 simParamQuantile1C5[[p, r]] = Quantile[
   simParamNoiseC5[[p, All]] /. NaN → Sequence[], myQuantile1];
 simParamQuantile2C5[[p, r]] = Quantile[
   simParamNoiseC5[[p, All]] /. NaN → Sequence[], myQuantile2];
];

(*if tau1 merge > 10 ms, use long trace for fitting*)
If[(1/simParamMedianC5[[15, r]]) > 0.01,
 Print["Long trace was used for fitting."];
 For[noiseN = 1, noiseN ≤ noiseRepeats, noiseN += 1,
  tmpToFitNoiseLong = Transpose[{tmpToFitLong[[All, 1]],
     # + RandomVariate[NormalDistribution[0, myNoiseLong]] & /@
      tmpToFitLong[[All, 2]]}];
  (*fit mono-exp to Long trace*)
  fitResultsTMP = NonlinearModelFit[tmpToFitNoiseLong, myFitMono[x1],
    {{delayMono, delayGuess}, {ampMono, ampGuess}, {tau1Mono,
      caAdjustedTau1Guess}}, x1, MaxIterations → myMaxIterations];
  fitResultLongMono = fitResultsTMP[{"BestFitParameters"}];
  simParamNoiseC5[[2, noiseN]] =
   fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
```

```
(*Print[fitResultsTMP["ANOVATableSumsOfSquares"]];*)
simParamNoiseC5[[3, noiseN]] = (delayMono /. fitResultLongMono)[[1]];
simParamNoiseC5[[4, noiseN]] = ((ampMono /. fitResultLongMono))[[1]];
simParamNoiseC5[[5, noiseN]] = (1 / (tau1Mono /. fitResultLongMono))[[1]];
(*fit bi-exp*)
fitResultsTMP =
 NonlinearModelFit[tmpToFitNoiseLong, myFitBi[x1], {{delay, delayGuess},
   {amp, ampGuess}, {amp1, amp1Guess}, {tau1, caAdjustedTau1Guess},
   {tau2, caAdjustedTau2Guess}}, x1, MaxIterations → myMaxIterations];
fitResultLongBi = fitResultsTMP[{"BestFitParameters"}];
simParamNoiseC5[[6, noiseN]] = simParamNoiseC5[[2, noiseN]] /
  fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
simParamNoiseC5[[7, noiseN]] = (delay /. fitResultLongBi)[[1]];
simParamNoiseC5[[8, noiseN]] = ((amp /. fitResultLongBi))[[1]];
simParamNoiseC5[[9, noiseN]] = ((amp amp1 /. fitResultLongBi))[[1]];
(*relative amp1*)
simParamNoiseC5[[10, noiseN]] = (1 / (tau1 /. fitResultLongBi))[[1]];
simParamNoiseC5[[11, noiseN]] = (1 / (tau2 /. fitResultLongBi))[[1]];
(*merge*)
If[
 (*to use the bi-exp fit,
 the following cirteria should be fullfilled:*)
 (*chi2 should improve(=decrease) by >4%*)
 (simParamNoiseC5[[6, noiseN]] > 1.04)
  &&
  (*tau1 and tau2 of bi fit should be factor of >3 different*)
  ((simParamNoiseC5[[11, noiseN]] / simParamNoiseC5[[10, noiseN]]) < 3.)
  &&
  (*relative amplitude of 1st component should be > 5% *)
  (((amp1 /. fitResultLongBi))[[1]] > 0.05)
  &&
  (*relative amplitude of 1st component should be < 95% *)
  (((amp1 /. fitResultLongBi))[[1]] < 0.95)
 ,
 (*take bi*)
 Print["take bi"];
 simParamNoiseC5[[12, noiseN]] = simParamNoiseC5[[7, noiseN]];
 (*delay*)
 simParamNoiseC5[[13, noiseN]] = simParamNoiseC5[[8, noiseN]];
 (*amp*)
 simParamNoiseC5[[14, noiseN]] = simParamNoiseC5[[9, noiseN]];
 (*amp1*)
 simParamNoiseC5[[15, noiseN]] = simParamNoiseC5[[10, noiseN]];
 (*tau1*)
 simParamNoiseC5[[16, noiseN]] = simParamNoiseC5[[11, noiseN]];(*tau2*)
 ,
```

```
    (*take mono*)
    Print["take mono"];
    simParamNoiseC5[[12, noiseN]] = simParamNoiseC5[[3, noiseN]];
    (*delay*)
    simParamNoiseC5[[13, noiseN]] = simParamNoiseC5[[4, noise N]];
    (*amp*)
    simParamNoiseC5[[14, noiseN]] = NaN; (*amp1*)
    simParamNoiseC5[[15, noiseN]] = simParamNoiseC5[[5, noiseN]];
    (*tau1*)
    simParamNoiseC5[[16, noiseN]] = NaN;(*tau2*)
  ];
];
(*plot last example of the noise loop*)
gr1 = ListPlot[tmpToFitNoiseLong, PlotRange → All, PlotStyle → Black];
gr2 = Plot[myFitMono[x1] /. fitResultLongMono, {x1, cursorStart,
   cursorEndLong}, PlotRange → All, PlotStyle → {Blue, Dashed}];
gr3 = Plot[myFitBi[x1] /. fitResultLongBi, {x1, cursorStart, cursorEndLong},
  PlotRange → All, PlotStyle → {Green, Dashed}];
Show[gr1, gr2, gr3, PlotRange → All ] // Print;
If[exportYes == 1,
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C5 dataLong.txt", tmpToFitNoiseLong, "Table"];
 toExport = Table[{t, (myFitMono[t] /. fitResultLongMono) [[1]]},
   {t, cursorStart, cursorEndLong, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C5 fitLongMono.txt", toExport, "Table"];
 toExport = Table[{t, (myFitBi[t] /. fitResultLongBi) [[1]]},
   {t, cursorStart, cursorEndLong, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C5 fitLongBi.txt", toExport, "Table"];

];
noiseN = noiseRepeats; (*fit parameter of last noisetrace*)
Print["Mono: chi2 = ", simParamNoiseC5[[2, noiseN]], "     d = ",
 simParamNoiseC5[[3, noiseN]], "     a = ", simParamNoiseC5[[4, noiseN]],
 "     t = ", 1/simParamNoiseC5[[5, noiseN]]];
Print["Bi: ratio chi2Mono/chi2Bi = ", simParamNoiseC5[[6, noiseN]],
 "     d = ", simParamNoiseC5[[7, noiseN]], "     a = ",
 simParamNoiseC5[[8, noiseN]], "     a1 = ", simParamNoiseC5[[9, noiseN]],
 "     t1 =", 1/simParamNoiseC5[[10, noiseN]],
 "     t2 = ", 1/simParamNoiseC5[[11, noiseN]]];
(*average fit results*)
For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
 simParamMedianC5[[p, r]] =
  Median[simParamNoiseC5[[p, All]] /. NaN → Sequence[]];
 simParamQuantile1C5[[p, r]] = Quantile[
```

```
      simParamNoiseC5[[p, All]] /. NaN → Sequence[], myQuantile1];
    simParamQuantile2C5[[p, r]] = Quantile[
      simParamNoiseC5[[p, All]] /. NaN → Sequence[], myQuantile2];
  ];
 ];

 , (*else: signal is not large enough*)
 For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
   simParamMedianC5[[p, r]] = {};
   simParamQuantile1C5[[p, r]] = {};
   simParamQuantile2C5[[p, r]] = {};
  ];
];


(*---------    Fitting of data,
saving of results, and plotting-----------------*)
(*-----------------------------------------------------------------------
                                        ----*)
(*-------------------------------------    C10     ------------------------
                        ----*)
(*-----------------------------------------------------------------------
                                        ----*)
Print[
 "-----------------------------------------------------------------------
   C10"];
(*check that signal is large enough relative to noise to obtain
 useful fit results. If not, do not do fitting and set everything to {}*)
If[simParamNv[[5, r]] > signalToNoiseRatioC10 myNoiseC10, (*add noise
  several times and do the fitting and than average the results*)
 For[noiseN = 1, noiseN ≤ noiseRepeats, noiseN += 1,
  (*Print[noiseN];*)
  tmpToFitNoise = Transpose[{tmpToFitC10[[All, 1]],
     # + RandomVariate[NormalDistribution[0, myNoiseC10]] & /@
      tmpToFitC10[[All, 2]]}];
  (*fit mono-exp*)
  fitResultsTMP = NonlinearModelFit[tmpToFitNoise, myFitMono[x1],
    {{delayMono, delayGuess}, {ampMono, ampGuess}, {tau1Mono,
      caAdjustedTau1Guess}}, x1, MaxIterations → myMaxIterations];
  fitResultMono = fitResultsTMP[{"BestFitParameters"}];
  simParamNoiseC10[[1, noiseN]] = 0; (*not used anymore*)
  simParamNoiseC10[[2, noiseN]] =
   fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
  (*Print[fitResultsTMP["ANOVATableSumsOfSquares"]];*)
  simParamNoiseC10[[3, noiseN]] = (delayMono /. fitResultMono)[[1]];
  simParamNoiseC10[[4, noiseN]] = ((ampMono /. fitResultMono))[[1]];
  simParamNoiseC10[[5, noiseN]] = (1 / (tau1Mono /. fitResultMono))[[1]];
```

```
(*fit bi-exp*)
fitResultsTMP =
 NonlinearModelFit[tmpToFitNoise, myFitBi[x1], {{delay, delayGuess},
   {amp, ampGuess}, {amp1, amp1Guess}, {tau1, caAdjustedTau1Guess},
   {tau2, caAdjustedTau2Guess}}, x1, MaxIterations → myMaxIterations];
fitResultBi = fitResultsTMP[{"BestFitParameters"}];
simParamNoiseC10[[6, noiseN]] = simParamNoiseC10[[2, noiseN]] /
  fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
simParamNoiseC10[[7, noiseN]] = (delay /. fitResultBi)[[1]];
simParamNoiseC10[[8, noiseN]] = ((amp /. fitResultBi))[[1]];
simParamNoiseC10[[9, noiseN]] = ((amp amp1 /. fitResultBi))[[1]];
(*relative amp1*)
simParamNoiseC10[[10, noiseN]] = (1 / (tau1 /. fitResultBi))[[1]];
simParamNoiseC10[[11, noiseN]] = (1 / (tau2 /. fitResultBi))[[1]];
(*merge*)
If[
 (*to use the bi-exp fit, the following cirteria should be fullfilled:*)
 (*chi2 should improve(=decrease) by >4%*)
 (simParamNoiseC10[[6, noiseN]] > 1.04)
  &&
  (*tau1 and tau2 of bi fit should be factor of >3 different*)
  ((simParamNoiseC10[[11, noiseN]] / simParamNoiseC10[[10, noiseN]]) < 3.)
  &&
  (*relative amplitude of 1st component should be > 5% *)
  (((amp1 /. fitResultBi))[[1]] > 0.05)
  &&
  (*relative amplitude of 1st component should be < 95% *)
  (((amp1 /. fitResultBi))[[1]] < 0.95)
 ,
 (*take bi*)
 Print["take bi"];
 simParamNoiseC10[[12, noiseN]] = simParamNoiseC10[[7, noiseN]];
 (*delay*)
 simParamNoiseC10[[13, noiseN]] = simParamNoiseC10[[8, noiseN]];
 (*amp*)
 simParamNoiseC10[[14, noiseN]] = simParamNoiseC10[[9, noiseN]];
 (*amp1*)
 simParamNoiseC10[[15, noiseN]] = simParamNoiseC10[[10, noiseN]];
 (*tau1*)
 simParamNoiseC10[[16, noiseN]] = simParamNoiseC10[[11, noiseN]];(*tau2*)
 ,
 (*take mono*)
 Print["take mono"];
 simParamNoiseC10[[12, noiseN]] = simParamNoiseC10[[3, noiseN]];
 (*delay*)
 simParamNoiseC10[[13, noiseN]] = simParamNoiseC10[[4, noiseN]];
 (*amp*)
```

```
  simParamNoiseC10[[14, noiseN]] = NaN; (*amp1*)
  simParamNoiseC10[[15, noiseN]] = simParamNoiseC10[[5, noiseN]];
  (*tau1*)
  simParamNoiseC10[[16, noiseN]] = NaN;(*tau2*)
 ];
];
(*plot last example of the noise loop*)
gr1 = ListPlot[tmpToFitNoise, PlotRange → All, PlotStyle → Black];
gr2 = Plot[myFitMono[x1] /. fitResultMono,
  {x1, cursorStart, cursorEnd}, PlotRange → All, PlotStyle → {Blue, Dashed}];
gr3 = Plot[myFitBi[x1] /. fitResultBi, {x1, cursorStart, cursorEnd},
  PlotRange → All, PlotStyle → {Green, Dashed}];
Show[gr1, gr2, gr3, PlotRange → All ] // Print;
If[exportYes == 1,
 Export["withinLoop r" <> ToString[r] <> " Ca" <>
   ToString[1*^6 myCaNow] <> " C10 data.txt", tmpToFitNoise, "Table"];
 toExport = Table[{t, (myFitMono[t] /. fitResultMono)[[1]]},
   {t, cursorStart, cursorEnd, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C10 fitMono.txt", toExport, "Table"];
 toExport = Table[{t, (myFitBi[t] /. fitResultBi)[[1]]},
   {t, cursorStart, cursorEnd, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C10 fitBi.txt", toExport, "Table"];
];
noiseN = noiseRepeats; (*fit parameter of last noisetrace*)
Print["Mono: chi2 = ", simParamNoiseC10[[2, noiseN]], "     d = ",
 simParamNoiseC10[[2, noiseN]], "     a = ", simParamNoiseC10[[4, noiseN]],
 "     t = ", 1/simParamNoiseC10[[5, noiseN]]];
Print["Bi: ratio chi2Mono/chi2Bi = ", simParamNoiseC10[[6, noiseN]],
 "     d = ", simParamNoiseC10[[7, noiseN]], "     a = ",
 simParamNoiseC10[[8, noiseN]], "     a1 = ", simParamNoiseC10[[9, noiseN]],
 "     t1 =", 1/simParamNoiseC10[[10, noiseN]],
 "     t2 = ", 1/simParamNoiseC10[[11, noiseN]]];
(*average fit results*)
For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
 simParamMedianC10[[p, r]] =
  Median[simParamNoiseC10[[p, All]] /. NaN → Sequence[]];
 simParamQuantile1C10[[p, r]] = Quantile[
   simParamNoiseC10[[p, All]] /. NaN → Sequence[], myQuantile1];
 simParamQuantile2C10[[p, r]] = Quantile[
   simParamNoiseC10[[p, All]] /. NaN → Sequence[], myQuantile2];
];

(*if tau1 merge > 10 ms, use long trace for fitting*)
If[(1/simParamMedianC10[[15, r]]) > 0.01,
```

```
Print["Long trace was used for fitting."];
For[noiseN = 1, noiseN ≤ noiseRepeats, noiseN += 1,
 tmpToFitNoiseLong = Transpose[{tmpToFitLong[[All, 1]],
    # + RandomVariate[NormalDistribution[0, myNoiseLong]] & /@
     tmpToFitLong[[All, 2]]}];
 (*fit mono-exp to Long trace*)
 fitResultsTMP = NonlinearModelFit[tmpToFitNoiseLong, myFitMono[x1],
   {{delayMono, delayGuess}, {ampMono, ampGuess}, {tau1Mono,
     caAdjustedTau1Guess}}, x1, MaxIterations → myMaxIterations];
 fitResultLongMono = fitResultsTMP[{"BestFitParameters"}];
 simParamNoiseC10[[2, noiseN]] =
  fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
 (*Print[fitResultsTMP["ANOVATableSumsOfSquares"]];*)
 simParamNoiseC10[[3, noiseN]] = (delayMono /. fitResultLongMono)[[1]];
 simParamNoiseC10[[4, noiseN]] = ((ampMono /. fitResultLongMono))[[1]];
 simParamNoiseC10[[5, noiseN]] = (1 / (tau1Mono /. fitResultLongMono))[[1]];
 (*fit bi-exp*)
 fitResultsTMP =
  NonlinearModelFit[tmpToFitNoiseLong, myFitBi[x1], {{delay, delayGuess},
    {amp, ampGuess}, {amp1, amp1Guess}, {tau1, caAdjustedTau1Guess},
    {tau2, caAdjustedTau2Guess}}, x1, MaxIterations → myMaxIterations];
 fitResultLongBi = fitResultsTMP[{"BestFitParameters"}];
 simParamNoiseC10[[6, noiseN]] = simParamNoiseC10[[2, noiseN]] /
   fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
 simParamNoiseC10[[7, noiseN]] = (delay /. fitResultLongBi)[[1]];
 simParamNoiseC10[[8, noiseN]] = ((amp /. fitResultLongBi))[[1]];
 simParamNoiseC10[[9, noiseN]] = ((amp amp1 /. fitResultLongBi))[[1]];
 (*relative amp1*)
 simParamNoiseC10[[10, noiseN]] = (1 / (tau1 /. fitResultLongBi))[[1]];
 simParamNoiseC10[[11, noiseN]] = (1 / (tau2 /. fitResultLongBi))[[1]];
 (*merge*)
 If[
  (*to use the bi-exp fit,
  the following cirteria should be fullfilled:*)
  (*chi2 should improve(=decrease) by >4%*)
  (simParamNoiseC10[[6, noiseN]] > 1.04)
   &&
   (*tau1 and tau2 of bi fit should be factor of >3 different*)
   ((simParamNoiseC10[[11, noiseN]] / simParamNoiseC10[[10, noiseN]]) < 3.)
   &&
   (*relative amplitude of 1st component should be > 5% *)
   (((amp1 /. fitResultLongBi))[[1]] > 0.05)
   &&
   (*relative amplitude of 1st component should be < 95% *)
   (((amp1 /. fitResultLongBi))[[1]] < 0.95)
  ,
```

```
  (*take bi*)
  Print["take bi"];
  simParamNoiseC10[[12, noiseN]] = simParamNoiseC10[[7, noiseN]];
  (*delay*)
  simParamNoiseC10[[13, noiseN]] = simParamNoiseC10[[8, noise N]];
  (*amp*)
  simParamNoiseC10[[14, noiseN]] = simParamNoiseC10[[9, noiseN]];
  (*amp1*)
  simParamNoiseC10[[15, noiseN]] = simParamNoiseC10[[10, noiseN]];
  (*tau1*)
  simParamNoiseC10[[16, noiseN]] = simParamNoiseC10[[11, noiseN]];(*tau2*)
  ,
  (*take mono*)
  Print["take mono"];
  simParamNoiseC10[[12, noiseN]] = simParamNoiseC10[[3, noiseN]];
  (*delay*)
  simParamNoiseC10[[13, noiseN]] = simParamNoiseC10[[4, noiseN]];
  (*amp*)
  simParamNoiseC10[[14, noiseN]] = NaN; (*amp1*)
  simParamNoiseC10[[15, noiseN]] = simParamNoiseC10[[5, noiseN]];
  (*tau1*)
  simParamNoiseC10[[16, noiseN]] = NaN;(*tau2*)
 ];
];
(*plot last example of the noise loop*)
gr1 = ListPlot[tmpToFitNoiseLong, PlotRange → All, PlotStyle → Black];
gr2 = Plot[myFitMono[x1] /. fitResultLongMono, {x1, cursorStart,
   cursorEndLong}, PlotRange → All, PlotStyle → {Blue, Dashed}];
gr3 = Plot[myFitBi[x1] /. fitResultLongBi, {x1, cursorStart, cursorEndLong},
  PlotRange → All, PlotStyle → {Green, Dashed}];
Show[gr1, gr2, gr3, PlotRange → All ] // Print;
If[exportYes == 1,
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C10 dataLong.txt", tmpToFitNoiseLong, "Table"];
 toExport = Table[{t, (myFitMono[t] /. fitResultLongMono) [[1]]},
   {t, cursorStart, cursorEndLong, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C10 fitLongMono.txt", toExport, "Table"];
 toExport = Table[{t, (myFitBi[t] /. fitResultLongBi) [[1]]},
   {t, cursorStart, cursorEndLong, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " C10 fitLongBi.txt", toExport, "Table"];

];
noiseN = noiseRepeats; (*fit parameter of last noisetrace*)
Print["Mono: chi2 = ", simParamNoiseC10[[2, noiseN]], "     d = ",
 simParamNoiseC10[[3, noiseN]], "     a = ", simParamNoiseC10[[4, noiseN]],
```

```
    "     t = ", 1/simParamNoiseC10[[5, noiseN]]];
   Print["Bi: ratio chi2Mono/chi2Bi = ", simParamNoiseC10[[6, noiseN]],
    "     d = ", simParamNoiseC10[[7, noiseN]], "     a = ",
    simParamNoiseC10[[8, noiseN]], "     a1 = ", simParamNoiseC10[[9, noiseN]],
    "     t1 =", 1/simParamNoiseC10[[10, noiseN]],
    "     t2 = ", 1/simParamNoiseC10[[11, noiseN]]];
   (*average fit results*)
   For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
    simParamMedianC10[[p, r]] =
     Median[simParamNoiseC10[[p, All]] /. NaN → Sequence[]];
    simParamQuantile1C10[[p, r]] = Quantile[
      simParamNoiseC10[[p, All]] /. NaN → Sequence[], myQuantile1];
    simParamQuantile2C10[[p, r]] = Quantile[
      simParamNoiseC10[[p, All]] /. NaN → Sequence[], myQuantile2];
   ];
  ];

  , (*else: signal is not large enough*)
  For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
    simParamMedianC10[[p, r]] = {};
    simParamQuantile1C10[[p, r]] = {};
    simParamQuantile2C10[[p, r]] = {};
   ];
 ];

 (*---------    Fitting of data,
 saving of results, and plotting-----------------*)
 (*-----------------------------------------------------------------------
                                        ----*)
 (*--------------------------------------    D     --------------------------
                        --*)
 (*-----------------------------------------------------------------------
                                        ----*)
 Print[
  "-----------------------------------------------------------------------
    D"];
 (*check that signal is large enough relative to noise to obtain
  useful fit results. If not, do not do fitting and set everything to {}*)
 If[simParamNv[[5, r]] > signalToNoiseRatioD myNoiseD, (*add noise
   several times and do the fitting and than average the results*)
  For[noiseN = 1, noiseN ≤ noiseRepeats, noiseN += 1,
   (*Print[noiseN];*)
   tmpToFitNoise = Transpose[{tmpToFitD[[All, 1]],
      # + RandomVariate[NormalDistribution[0, myNoiseD]] & /@
       tmpToFitD[[All, 2]]}];
   (*fit mono-exp*)
   fitResultsTMP = NonlinearModelFit[tmpToFitNoise, myFitMono[x1],
```

```
  {{delayMono, delayGuess}, {ampMono, ampGuess}, {tau1Mono,
    caAdjustedTau1Guess}}, x1, MaxIterations → myMaxIterations];
fitResultMono = fitResultsTMP[{"BestFitParameters"}];
simParamNoiseD[[1, noiseN]] = 0; (*not used anymore*)
simParamNoiseD[[2, noiseN]] =
 fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
(*Print[fitResultsTMP["ANOVATableSumsOfSquares"]];*)
simParamNoiseD[[3, noiseN]] = (delayMono /. fitResultMono)[[1]];
simParamNoiseD[[4, noiseN]] = ((ampMono /. fitResultMono))[[1]];
simParamNoiseD[[5, noiseN]] = (1 / (tau1Mono /. fitResultMono))[[1]];
(*fit bi-exp*)
fitResultsTMP =
 NonlinearModelFit[tmpToFitNoise, myFitBi[x1], {{delay, delayGuess},
   {amp, ampGuess}, {amp1, amp1Guess}, {tau1, caAdjustedTau1Guess},
   {tau2, caAdjustedTau2Guess}}, x1, MaxIterations → myMaxIterations];
fitResultBi = fitResultsTMP[{"BestFitParameters"}];
simParamNoiseD[[6, noiseN]] = simParamNoiseD[[2, noiseN]] /
  fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
simParamNoiseD[[7, noiseN]] = (delay /. fitResultBi)[[1]];
simParamNoiseD[[8, noiseN]] = ((amp /. fitResultBi))[[1]];
simParamNoiseD[[9, noiseN]] = ((amp amp1 /. fitResultBi))[[1]];
(*relative amp1*)
simParamNoiseD[[10, noiseN]] = (1 / (tau1 /. fitResultBi))[[1]];
simParamNoiseD[[11, noiseN]] = (1 / (tau2 /. fitResultBi))[[1]];
(*merge*)
If[
 (*to use the bi-exp fit, the following cirteria should be fullfilled:*)
 (*chi2 should improve(=decrease) by >4%*)
 (simParamNoiseD[[6, noiseN]] > 1.04)
  &&
  (*tau1 and tau2 of bi fit should be factor of >3 different*)
  ((simParamNoiseD[[11, noiseN]] / simParamNoiseD[[10, noiseN]]) < 3.)
  &&
  (*relative amplitude of 1st component should be > 5% *)
  (((amp1 /. fitResultBi))[[1]] > 0.05)
  &&
  (*relative amplitude of 1st component should be < 95% *)
  (((amp1 /. fitResultBi))[[1]] < 0.95)
 ,
 (*take bi*)
 Print["take bi"];
 simParamNoiseD[[12, noiseN]] = simParamNoiseD[[7, noiseN]];
 (*delay*)
 simParamNoiseD[[13, noiseN]] = simParamNoiseD[[8, noiseN]];
 (*amp*)
 simParamNoiseD[[14, noiseN]] = simParamNoiseD[[9, noiseN]];
```

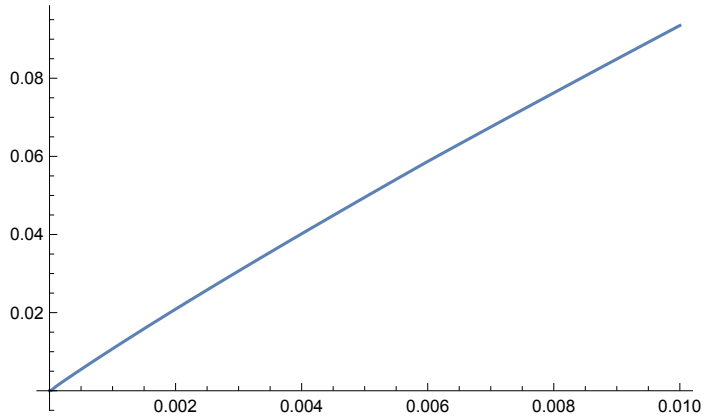
```
    (*amp1*)
    simParamNoiseD[[15, noiseN]] = simParamNoiseD[[10, noiseN]];
    (*tau1*)
    simParamNoiseD[[16, noiseN]] = simParamNoiseD[[11, noiseN]];(*tau2*)
    ,
    (*take mono*)
    Print["take mono"];
    simParamNoiseD[[12, noiseN]] = simParamNoiseD[[3, noiseN]];
    (*delay*)
    simParamNoiseD[[13, noiseN]] = simParamNoiseD[[4, noiseN]];
    (*amp*)
    simParamNoiseD[[14, noiseN]] = NaN; (*amp1*)
    simParamNoiseD[[15, noiseN]] = simParamNoiseD[[5, noiseN]];
    (*tau1*)
    simParamNoiseD[[16, noiseN]] = NaN;(*tau2*)
  ];
];
(*plot last example of the noise loop*)
gr1 = ListPlot[tmpToFitNoise, PlotRange → All, PlotStyle → Black];
gr2 = Plot[myFitMono[x1] /. fitResultMono,
  {x1, cursorStart, cursorEnd}, PlotRange → All, PlotStyle → {Blue, Dashed}];
gr3 = Plot[myFitBi[x1] /. fitResultBi, {x1, cursorStart, cursorEnd},
  PlotRange → All, PlotStyle → {Green, Dashed}];
Show[gr1, gr2, gr3, PlotRange → All ] // Print;
If[exportYes == 1,
 Export["withinLoop r" <> ToString[r] <> " Ca" <>
   ToString[1*^6 myCaNow] <> " D data.txt", tmpToFitNoise, "Table"];
 toExport = Table[{t, (myFitMono[t] /. fitResultMono) [[1]]},
   {t, cursorStart, cursorEnd, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
   " D fitMono.txt", toExport, "Table"];
 toExport = Table[{t, (myFitBi[t] /. fitResultBi) [[1]]},
   {t, cursorStart, cursorEnd, dtOfPlotsForExport}];
 Export["withinLoop r" <> ToString[r] <> " Ca" <>
   ToString[1*^6 myCaNow] <> " D fitBi.txt", toExport, "Table"];
];
noiseN = noiseRepeats; (*fit parameter of last noisetrace*)
Print["Mono: chi2 = ", simParamNoiseD[[2, noiseN]],
 "     d = ", simParamNoiseD[[2, noiseN]], "     a = ",
 simParamNoiseD[[4, noiseN]], "     t = ", 1/simParamNoiseD[[5, noiseN]]];
Print["Bi: ratio chi2Mono/chi2Bi = ", simParamNoiseD[[6, noiseN]],
 "     d = ", simParamNoiseD[[7, noiseN]], "     a = ",
 simParamNoiseD[[8, noiseN]], "     a1 = ", simParamNoiseD[[9, noiseN]],
 "     t1 =", 1/simParamNoiseD[[10, noiseN]],
 "     t2 = ", 1/simParamNoiseD[[11, noiseN]]];
(*average fit results*)
```

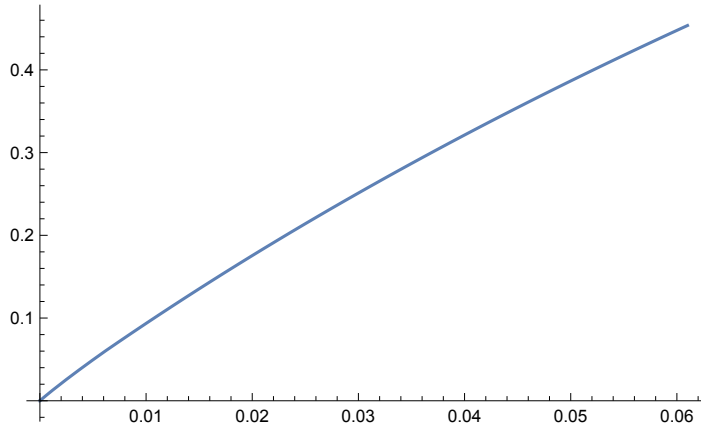
```
For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
 simParamMedianD[[p, r]] =
  Median[simParamNoiseD[[p, All]] /. NaN → Sequence[]];
 simParamQuantile1D[[p, r]] = Quantile[
   simParamNoiseD[[p, All]] /. NaN → Sequence[], myQuantile1];
 simParamQuantile2D[[p, r]] = Quantile[
   simParamNoiseD[[p, All]] /. NaN → Sequence[], myQuantile2];
];

(*if tau1 merge > 10 ms, use long trace for fitting*)
If[(1 / simParamMedianD[[15, r]]) > 0.01,
 Print["Long trace was used for fitting."];
 For[noiseN = 1, noiseN ≤ noiseRepeats, noiseN += 1,
  tmpToFitNoiseLong = Transpose[{tmpToFitLong[[All, 1]],
     # + RandomVariate[NormalDistribution[0, myNoiseLong]] & /@
      tmpToFitLong[[All, 2]]}];
  (*fit mono-exp to Long trace*)
  fitResultsTMP = NonlinearModelFit[tmpToFitNoiseLong, myFitMono[x1],
    {{delayMono, delayGuess}, {ampMono, ampGuess}, {tau1Mono,
      caAdjustedTau1Guess}}, x1, MaxIterations → myMaxIterations];
  fitResultLongMono = fitResultsTMP[{"BestFitParameters"}];
  simParamNoiseD[[2, noiseN]] =
   fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
  (*Print[fitResultsTMP["ANOVATableSumsOfSquares"]];*)
  simParamNoiseD[[3, noiseN]] = (delayMono /. fitResultLongMono)[[1]];
  simParamNoiseD[[4, noiseN]] = ((ampMono /. fitResultLongMono))[[1]];
  simParamNoiseD[[5, noiseN]] = (1 / (tau1Mono /. fitResultLongMono))[[1]];
  (*fit bi-exp*)
  fitResultsTMP =
   NonlinearModelFit[tmpToFitNoiseLong, myFitBi[x1], {{delay, delayGuess},
     {amp, ampGuess}, {amp1, amp1Guess}, {tau1, caAdjustedTau1Guess},
     {tau2, caAdjustedTau2Guess}}, x1, MaxIterations → myMaxIterations];
  fitResultLongBi = fitResultsTMP[{"BestFitParameters"}];
  simParamNoiseD[[6, noiseN]] = simParamNoiseD[[2, noiseN]] /
    fitResultsTMP["ANOVATableSumsOfSquares"][[2]];
  simParamNoiseD[[7, noiseN]] = (delay /. fitResultLongBi)[[1]];
  simParamNoiseD[[8, noiseN]] = ((amp /. fitResultLongBi))[[1]];
  simParamNoiseD[[9, noiseN]] = ((amp amp1 /. fitResultLongBi))[[1]];
  (*relative amp1*)
  simParamNoiseD[[10, noiseN]] = (1 / (tau1 /. fitResultLongBi))[[1]];
  simParamNoiseD[[11, noiseN]] = (1 / (tau2 /. fitResultLongBi))[[1]];
  (*merge*)
  If[
   (*to use the bi-exp fit,
   the following cirteria should be fullfilled:*)
   (*chi2 should improve(=decrease) by >4%*)
```

```
    (simParamNoiseD[[6, noiseN]] > 1.04)
     &&
     (*tau1 and tau2 of bi fit should be factor of >3 different*)
     ((simParamNoiseD[[11, noiseN]] / simParamNoiseD[[10, noiseN]]) < 3.)
     &&
     (*relative amplitude of 1st component should be > 5% *)
     (((amp1 /. fitResultLongBi))[[1]] > 0.05)
     &&
     (*relative amplitude of 1st component should be < 95% *)
     (((amp1 /. fitResultLongBi))[[1]] < 0.95)
    ,
    (*take bi*)
    Print["take bi"];
    simParamNoiseD[[12, noiseN]] = simParamNoiseD[[7, noiseN]];
    (*delay*)
    simParamNoiseD[[13, noiseN]] = simParamNoiseD[[8, noiseN]];
    (*amp*)
    simParamNoiseD[[14, noiseN]] = simParamNoiseD[[9, noiseN]];
    (*amp1*)
    simParamNoiseD[[15, noiseN]] = simParamNoiseD[[10, noiseN]];
    (*tau1*)
    simParamNoiseD[[16, noiseN]] = simParamNoiseD[[11, noiseN]];(*tau2*)
    ,
    (*take mono*)
    Print["take mono"];
    simParamNoiseD[[12, noiseN]] = simParamNoiseD[[3, noiseN]];
    (*delay*)
    simParamNoiseD[[13, noiseN]] = simParamNoiseD[[4, noiseN]];
    (*amp*)
    simParamNoiseD[[14, noiseN]] = NaN; (*amp1*)
    simParamNoiseD[[15, noiseN]] = simParamNoiseD[[5, noiseN]];
    (*tau1*)
    simParamNoiseD[[16, noiseN]] = NaN;(*tau2*)
   ];
  ];
  (*plot last example of the noise loop*)
  gr1 = ListPlot[tmpToFitNoiseLong, PlotRange → All, PlotStyle → Black];
  gr2 = Plot[myFitMono[x1] /. fitResultLongMono, {x1, cursorStart,
     cursorEndLong}, PlotRange → All, PlotStyle → {Blue, Dashed}];
  gr3 = Plot[myFitBi[x1] /. fitResultLongBi, {x1, cursorStart, cursorEndLong},
    PlotRange → All, PlotStyle → {Green, Dashed}];
  Show[gr1, gr2, gr3, PlotRange → All ] // Print;
  If[exportYes == 1,
   Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
     " D dataLong.txt", tmpToFitNoiseLong, "Table"];
   toExport = Table[{t, (myFitMono[t] /. fitResultLongMono)[[1]]},
     {t, cursorStart, cursorEndLong, dtOfPlotsForExport}];
```

```
      Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
        " D fitLongMono.txt", toExport, "Table"];
      toExport = Table[{t, (myFitBi[t] /. fitResultLongBi)[[1]]},
        {t, cursorStart, cursorEndLong, dtOfPlotsForExport}];
      Export["withinLoop r" <> ToString[r] <> " Ca" <> ToString[1*^6 myCaNow] <>
        " D fitLongBi.txt", toExport, "Table"];

     ];
     noiseN = noiseRepeats; (*fit parameter of last noisetrace*)
     Print["Mono: chi2 = ", simParamNoiseD[[2, noiseN]],
      "     d = ", simParamNoiseD[[3, noiseN]], "     a = ",
      simParamNoiseD[[4, noiseN]], "     t = ", 1/simParamNoiseD[[5, noiseN]]];
     Print["Bi: ratio chi2Mono/chi2Bi = ", simParamNoiseD[[6, noiseN]],
      "     d = ", simParamNoiseD[[7, noiseN]], "     a = ",
      simParamNoiseD[[8, noiseN]], "     a1 = ", simParamNoiseD[[9, noiseN]],
      "     t1 =", 1/simParamNoiseD[[10, noiseN]],
      "     t2 = ", 1/simParamNoiseD[[11, noiseN]]];
     (*average fit results*)
     For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
      simParamMedianD[[p, r]] =
       Median[simParamNoiseD[[p, All]] /. NaN → Sequence[]];
      simParamQuantile1D[[p, r]] = Quantile[
        simParamNoiseD[[p, All]] /. NaN → Sequence[], myQuantile1];
      simParamQuantile2D[[p, r]] = Quantile[
        simParamNoiseD[[p, All]] /. NaN → Sequence[], myQuantile2];
     ];
    ];

    , (*else: signal is not large enough*)
    For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
      simParamMedianD[[p, r]] = {};
      simParamQuantile1D[[p, r]] = {};
      simParamQuantile2D[[p, r]] = {};
     ];
   ];
  ];
```

```
-------------------------------------------------------------------------------------
  -------------------------
----------------    Ca = 0.703073
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```




```
------------------------------------------------------------------------ C5
------------------------------------------------------------------------ C10
------------------------------------------------------------------------ D
take mono
take mono
```

NonlinearModelFit: Failed to converge to the requested accuracy or precision within 100 iterations.

```
take mono
take mono
```

NonlinearModelFit: Failed to converge to the requested accuracy or precision within 100 iterations.

```
take mono
take mono
take mono
take mono
take mono
```

NonlinearModelFit: The step size in the search has become less than the tolerance prescribed by the PrecisionGoal option, but the gradient is larger than the tolerance specified by the AccuracyGoal option. There is a possibility that the method has stalled at a point that is not a local minimum.

```
take mono
take mono
```

NonlinearModelFit: Failed to converge to the requested accuracy or precision within 100 iterations.

General: Further output of NonlinearModelFit::cvmit will be suppressed during this calculation.

```
take mono
take mono
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take mono
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take mono
take mono
```

General: Exp[−2193.62] is too small to represent as a normalized machine number; precision may be lost.

General: Exp[−4829.85] is too small to represent as a normalized machine number; precision may be lost.

General: Exp[−7466.07] is too small to represent as a normalized machine number; precision may be lost.

General: Further output of General::munfl will be suppressed during this calculation.

```
take mono
take mono
take mono
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take mono
take mono
take mono
take mono
```

NonlinearModelFit: The step size in the search has become less than the tolerance prescribed by the PrecisionGoal option, but the gradient is larger than the tolerance specified by the AccuracyGoal option. There is a possibility that the method has stalled at a point that is not a local minimum.

```
take mono
take mono
take mono
take mono
take mono
```

NonlinearModelFit: The step size in the search has become less than the tolerance prescribed by the PrecisionGoal option, but the gradient is larger than the tolerance specified by the AccuracyGoal option. There is a possibility that the method has stalled at a point that is not a local minimum.

General: Further output of NonlinearModelFit::sszero will be suppressed during this calculation.

```
take mono
take mono
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take mono
take mono
```

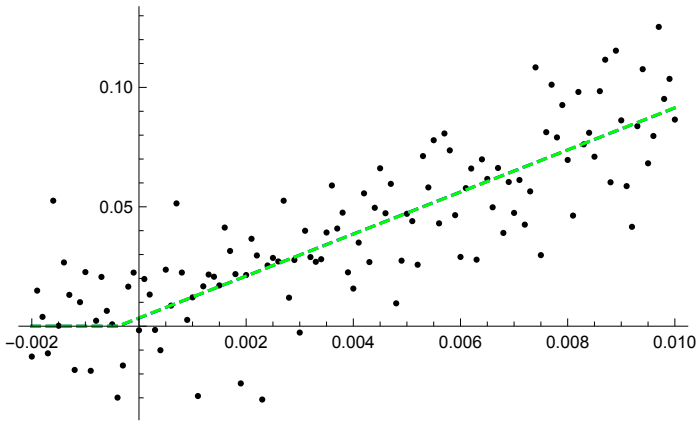


Mono: chi2 = 0.045529  d = 0.045529  a = $2.77991 \times 10^{6}$  t = 315 826.

Bi: ratio chi2Mono/chi2Bi = 1.00038  d = −0.0004  a = 6.96197  a1 = −2.30969  t1 =0.203723  t2 = 0.461828

Quantile: Argument {} should be a non−empty list.

Quantile: Argument {} should be a non−empty list.

Quantile: Argument {} should be a non−empty list.

General: Further output of Quantile::empt will be suppressed during this calculation.

Long trace was used for fitting.

```
take mono
take mono
take mono
take mono
take mono
take mono
```

```
take mono
take mono
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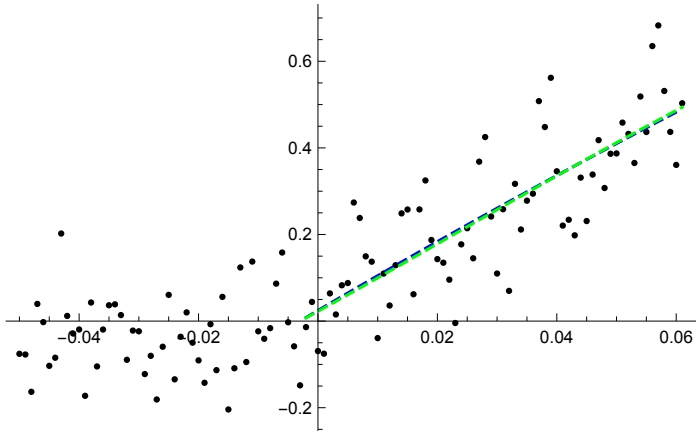


```
Mono: chi2 = 1.13349      d = -0.003      a = 3.96848      t = 0.485923
Bi: ratio chi2Mono/chi2Bi = 0.999521      d = -0.003      a =
 1.91103      a1 = -0.182588      t1 =0.0415653      t2 = 0.176371
-------------------------------------------------------------------------------------
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----------------     Ca = 0.729825
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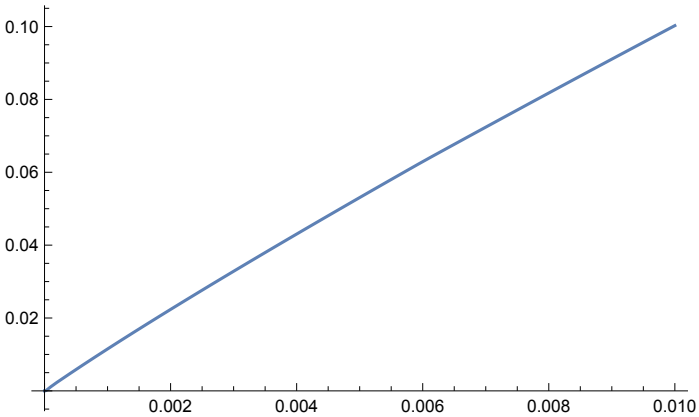

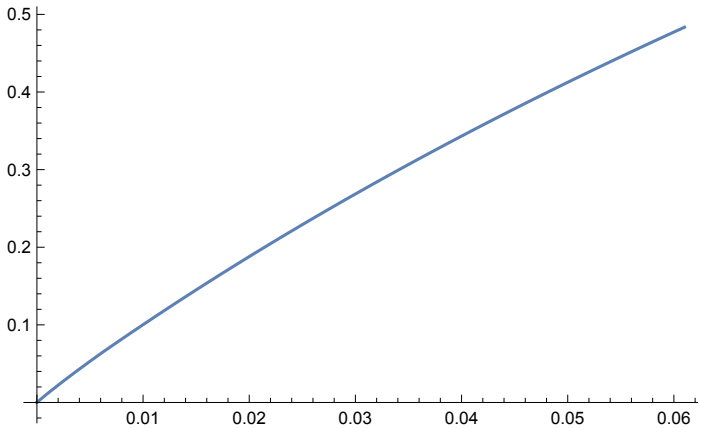


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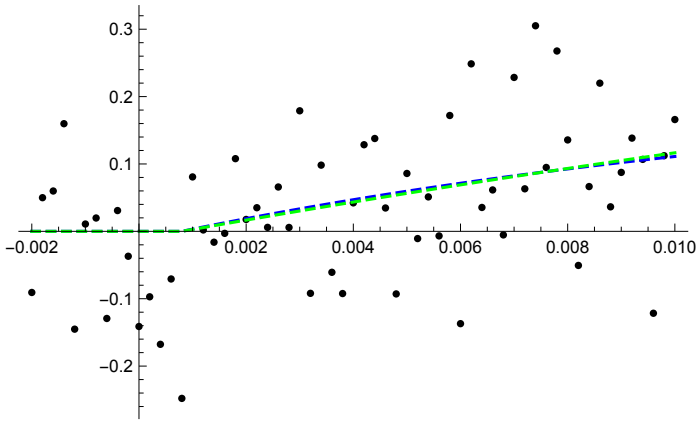


```
Mono: chi2 = 0.635202     d = 0.635202     a = 0.234827     t = 0.0143561
Bi: ratio chi2Mono/chi2Bi = 0.999507     d = 0.0008     a =
 0.87096     a1 = 0.579257     t1 =0.0415693     t2 = 1.73007
Long trace was used for fitting.
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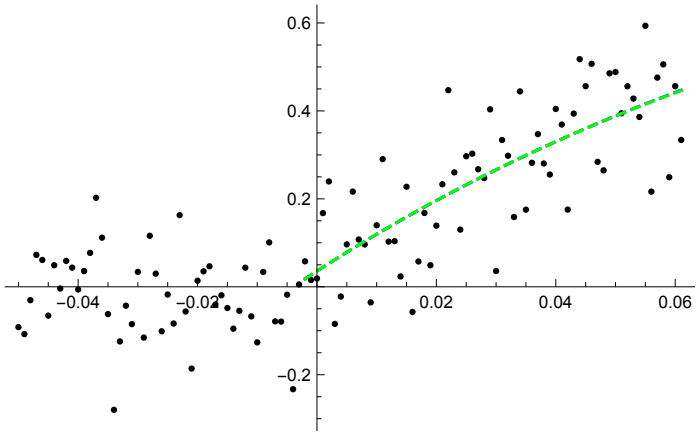


```
Mono: chi2 = 1.18239     d = -0.004     a = 1.00778     t = 0.110888
Bi: ratio chi2Mono/chi2Bi = 1.00002     d = -0.004     a =
 0.73437     a1 = 1.12628     t1 =0.116297     t2 = 0.678501
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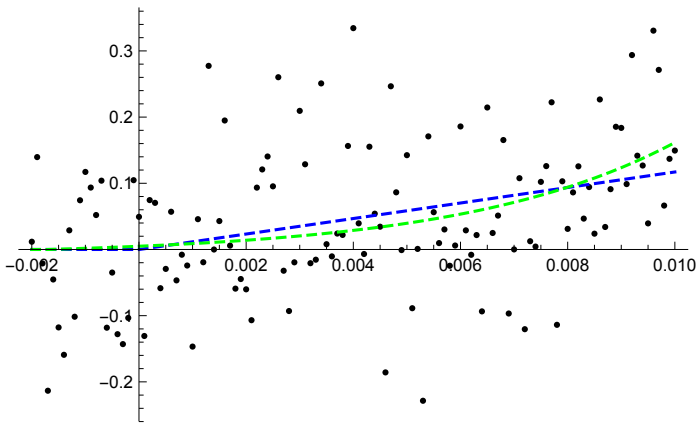

```
Mono: chi2 = 1.39325     d = 1.39325     a = 6.36905 × 10^6     t = 543623.
Bi: ratio chi2Mono/chi2Bi = 1.01485     d = -0.0017     a =
 -0.280768     a1 = -0.00856142     t1 =-0.00392744     t2 = -1.85241
Long trace was used for fitting.
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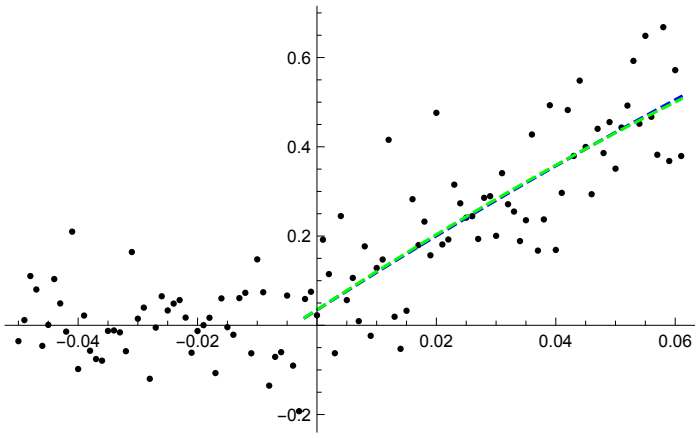


```
Mono: chi2 = 1.00984      d = -0.004      a = 3.03298      t = 0.351024
Bi: ratio chi2Mono/chi2Bi = 0.999093      d = -0.004      a =
 1.87646      a1 = -0.0076668      t1 =0.0154707      t2 = 0.203778
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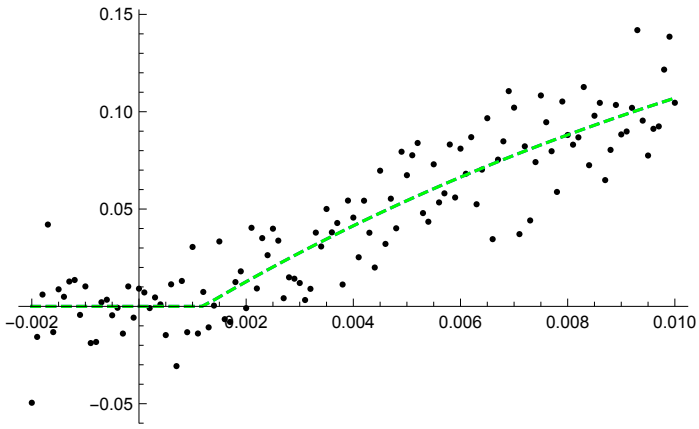


```
Mono: chi2 = 0.037233     d = 0.037233     a = 0.232881     t = 0.014308
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.00119921     a =
 0.417647     a1 = 0.228425     t1 =0.0141487     t2 = 1.38258
Long trace was used for fitting.
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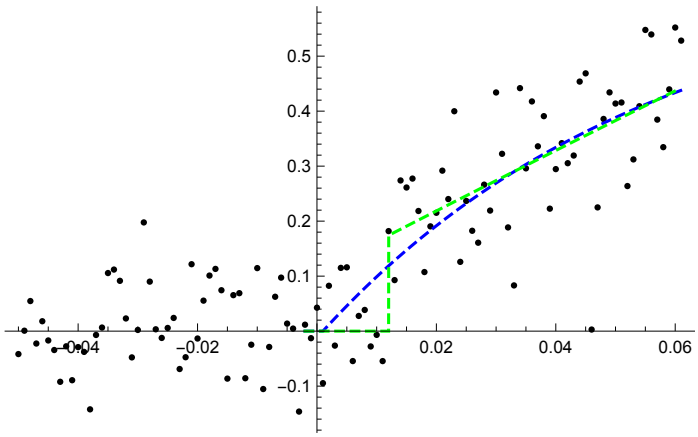
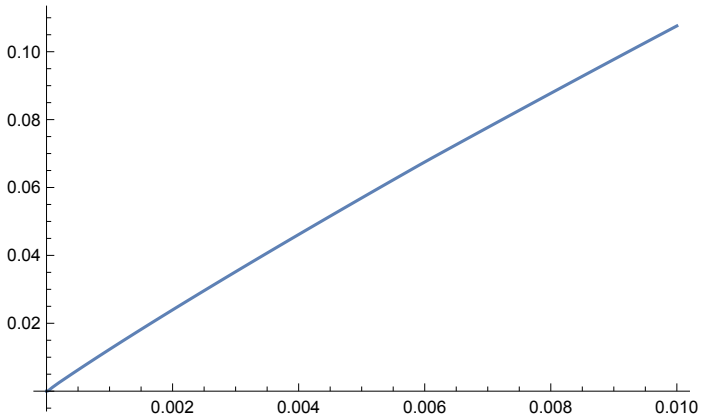


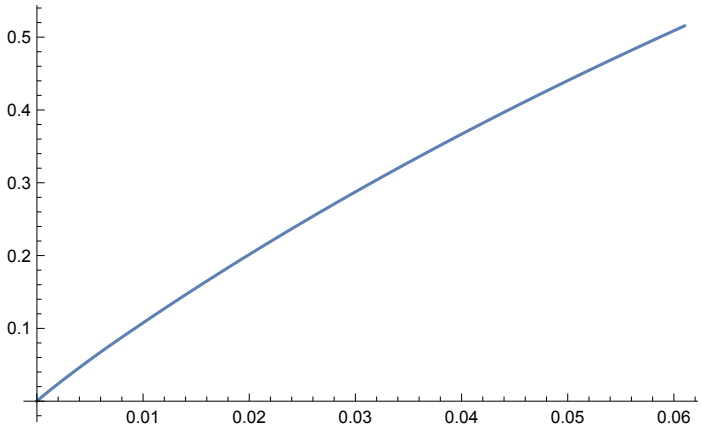

Mono: chi2 = 0.894792  d = 0.001  a = 0.665997  t = 0.0560011

Bi: ratio chi2Mono/chi2Bi = 1.09123  d = 0.012  a = 7.76157  a1 = 0.174125  t1 = $7.95169 \times 10^{-10}$  t2 = 1.36231

---

---------- Ca = 0.758204
uM ----------
---
---




---------- C5

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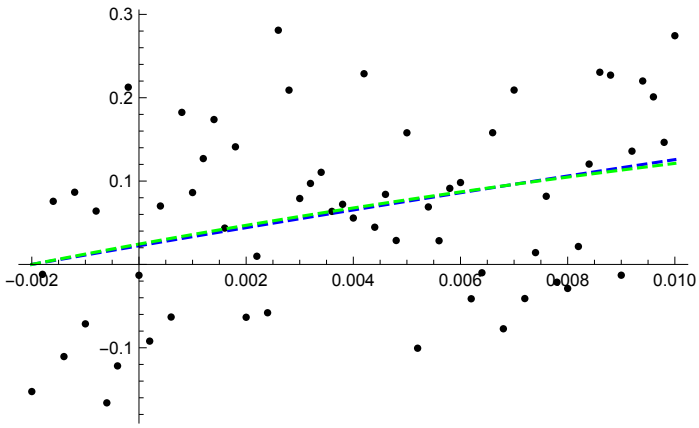


```
Mono: chi2 = 0.637024     d = 0.637024     a = 0.867192     t = 0.0766031
Bi: ratio chi2Mono/chi2Bi = 1.00031     d = -0.002     a =
 -0.503735     a1 = 0.295347     t1 =0.0241826     t2 = -1.68935
Long trace was used for fitting.
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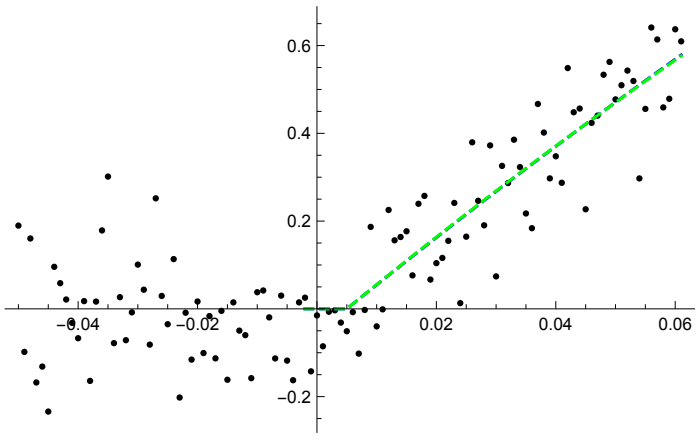


```
Mono: chi2 = 1.17196     d = 0.005     a = 4.62144     t = 0.41887
Bi: ratio chi2Mono/chi2Bi = 0.999928     d = 0.005     a =
 -2.60508     a1 = 5.97509     t1 =0.431391     t2 = 3.15514
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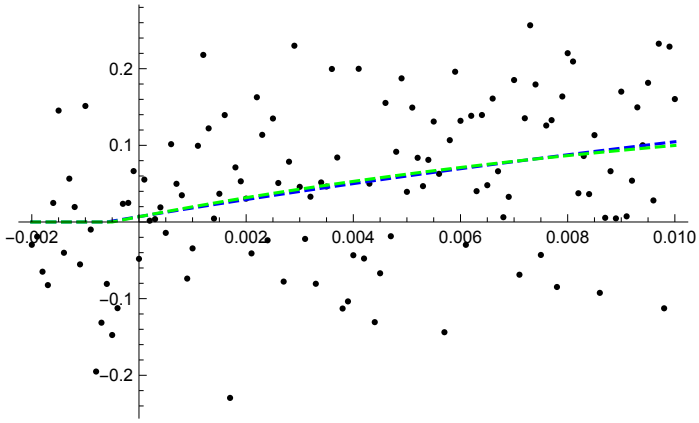


```
Mono: chi2 = 1.08877     d = 1.08877     a = 0.346068     t = 0.0294338
Bi: ratio chi2Mono/chi2Bi = 1.00095     d = -0.0005     a =
 0.422197     a1 = 0.169393     t1 =0.0123168     t2 = 0.991955
Long trace was used for fitting.
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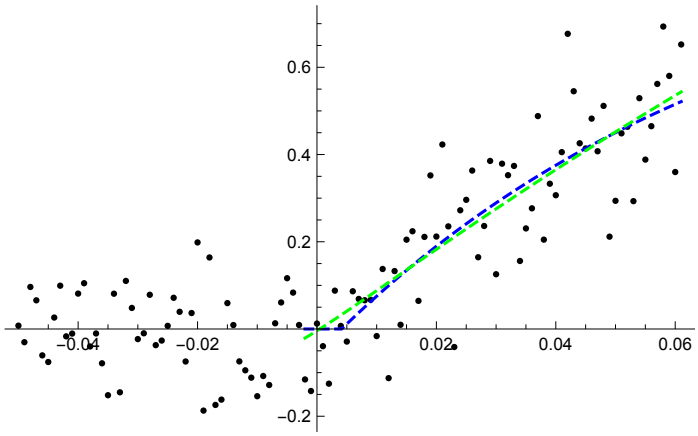


```
Mono: chi2 = 1.21055     d = 0.00412708     a = 0.943694     t = 0.0707459

Bi: ratio chi2Mono/chi2Bi = 1.02899     d = -0.02     a =
 2.80882     a1 = -0.225863     t1 =0.00649769     t2 = 0.276991

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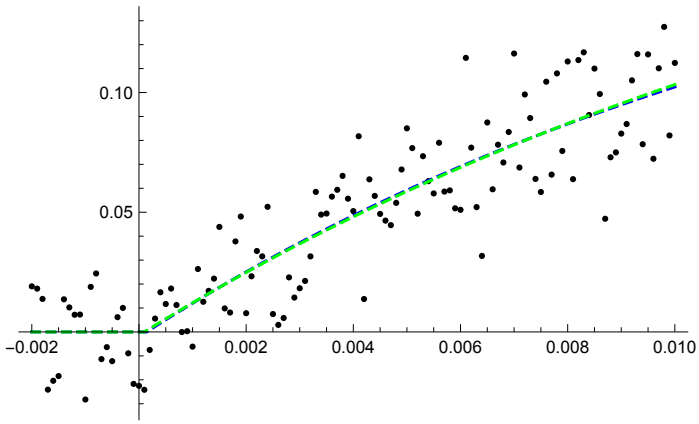


```
Mono: chi2 = 0.0381152     d = 0.0381152     a = 0.205463     t = 0.0142969
Bi: ratio chi2Mono/chi2Bi = 0.999503     d = 0.0001     a =
 0.823864     a1 = 0.202376     t1 =0.0155     t2 = 0.785006
Long trace was used for fitting.
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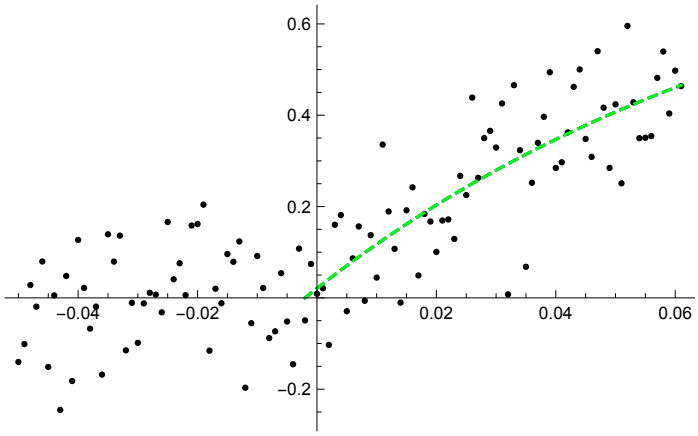


```
Mono: chi2 = 1.20257     d = -0.002     a = 0.883191     t = 0.0841135
Bi: ratio chi2Mono/chi2Bi = 0.999936     d = -0.002     a =
 0.96287     a1 = 0.359212     t1 =0.0623215     t2 = 0.126195
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----------------     Ca = 0.788054
  uM         -------------------------------------------------------
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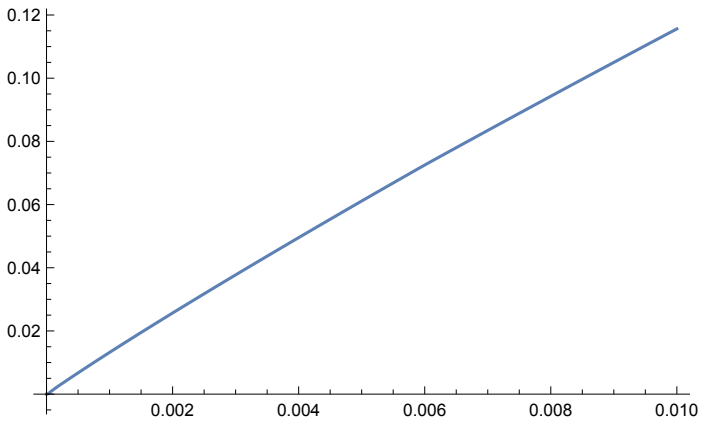

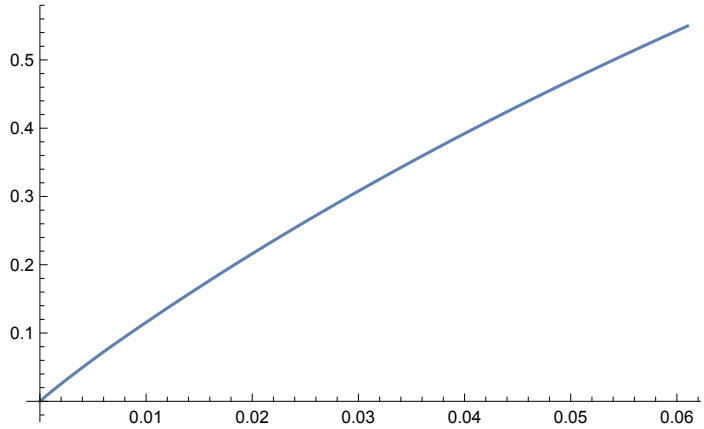


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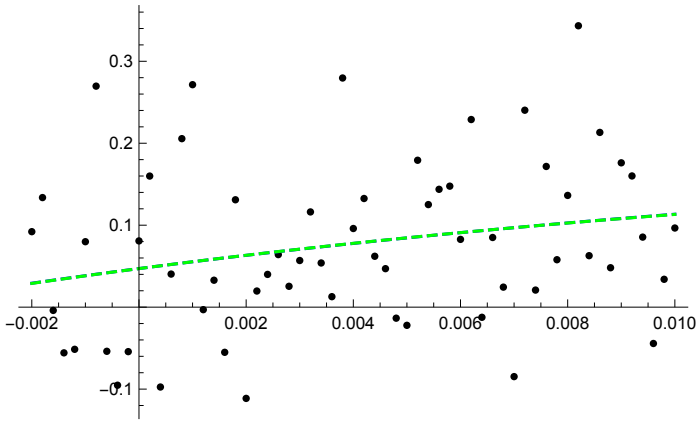


```
Mono: chi2 = 0.592291     d = 0.592291     a = 0.211008     t = 0.0192932
Bi: ratio chi2Mono/chi2Bi = 1.00002     d = -0.00481566     a =
 0.15033     a1 = 0.245031     t1 =0.0202609     t2 = 0.0929426
Long trace was used for fitting.
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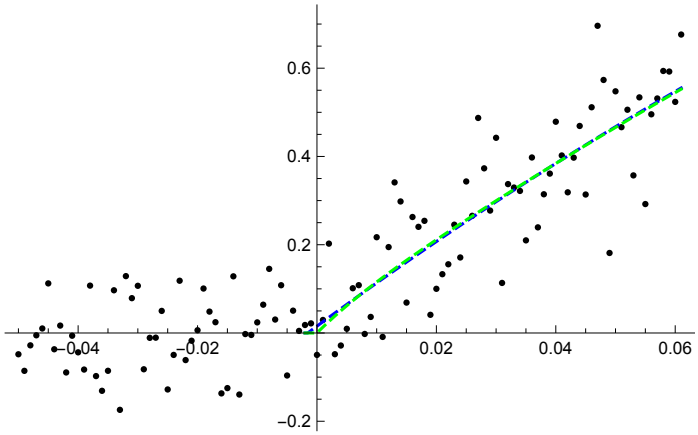


Mono: chi2 = 1.02757 d = -0.00154517 a = 2.49267 t = 0.24826

Bi: ratio chi2Mono/chi2Bi = 1.0014 d = $-2.62671 \times 10^{-16}$ a = 3.01561 a1 = 0.0314137 t1 =0.00748143 t2 = 0.31786

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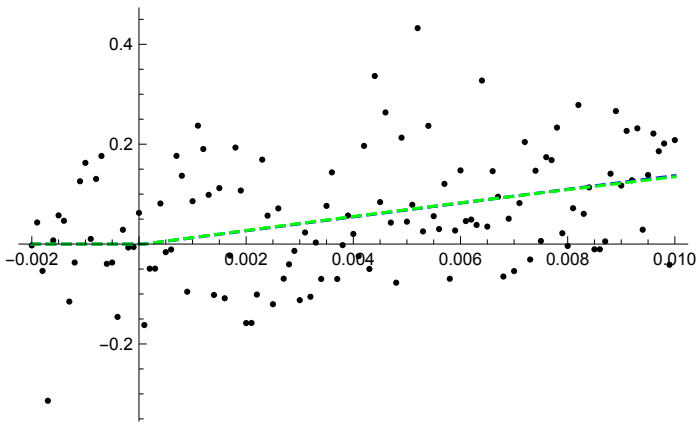

```
Mono: chi2 = 1.5224     d = 1.5224     a = 3.39062     t = 0.240294
Bi: ratio chi2Mono/chi2Bi = 0.999634     d = 0.0001     a =
 1.5004     a1 = 0.285363     t1 =0.0437891     t2 = 0.151062
Long trace was used for fitting.
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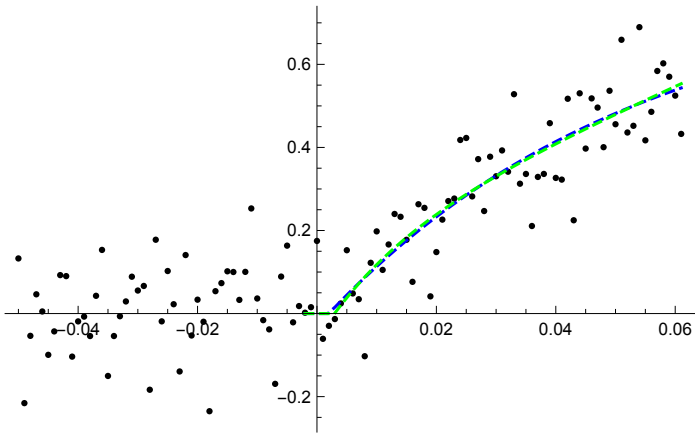


```
Mono: chi2 = 1.0147     d = 0.002     a = 0.808602     t = 0.0529592
Bi: ratio chi2Mono/chi2Bi = 1.0018     d = 0.00294503     a =
 13.1046     a1 = 0.17798     t1 =0.0137973     t2 = 1.95611
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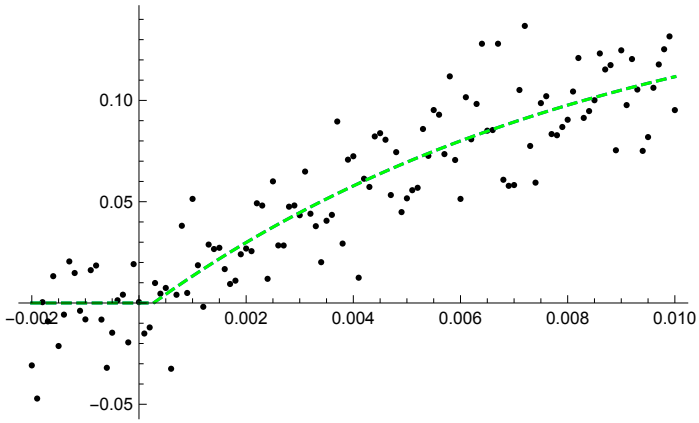


```
Mono: chi2 = 0.0429621     d = 0.0429621     a = 0.166153     t = 0.00871987

Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000272214     a =
 0.161239     a1 = 0.166223     t1 =0.0087228     t2 = 1.28786

Long trace was used for fitting.

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LinearAlgebra`BLAS`TRSV: Machine overflow encountered during computations.

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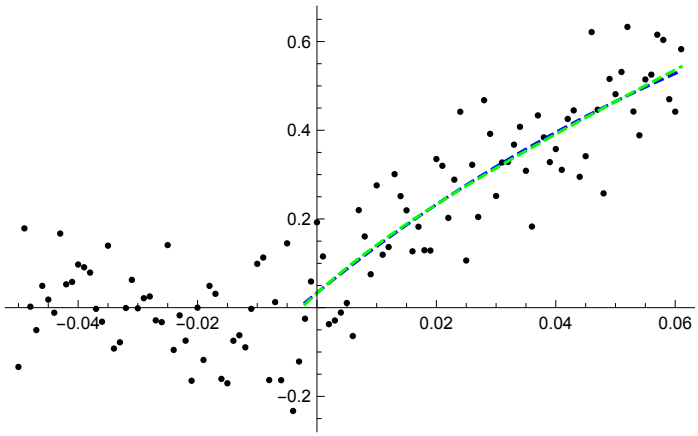


```
Mono: chi2 = 1.00262     d = -0.003     a = 1.12121     t = 0.0989511
Bi: ratio chi2Mono/chi2Bi = 1.00174     d = -0.00257927     a =
 6.07177     a1 = 0.0834601     t1 =0.0151013     t2 = 0.79381
-------------------------------------------------------------------------------------
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---------- Ca = 0.820427

uM ----------

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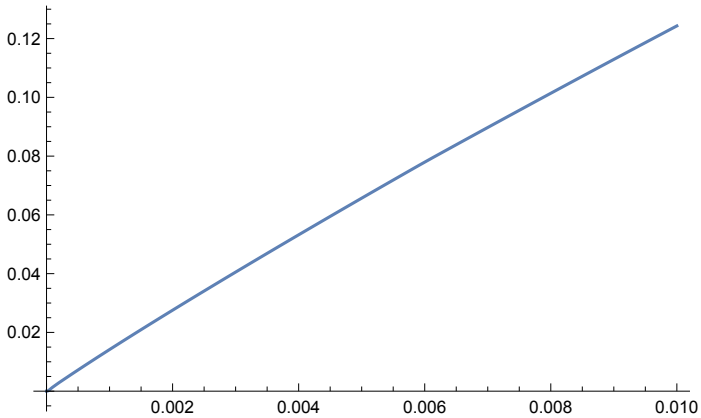


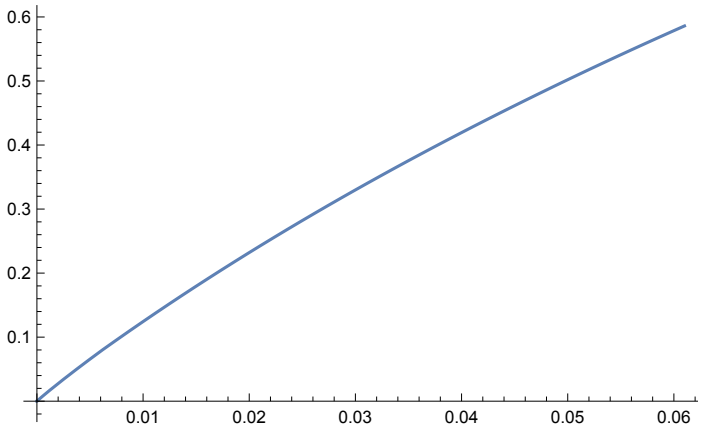


---------- C5

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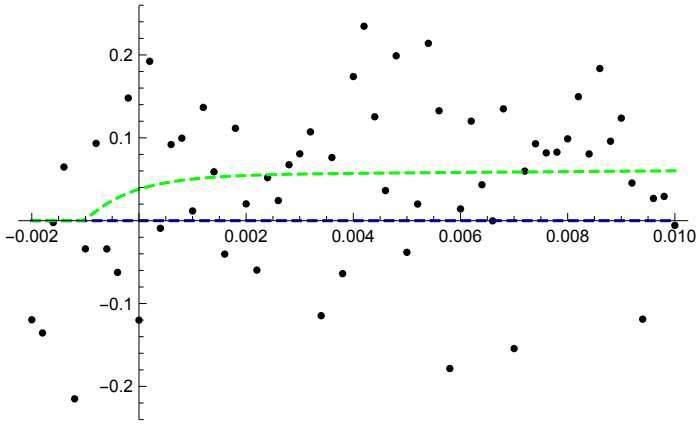


```
Mono: chi2 = 0.716818     d = 0.716818     a = -0.1421     t = 0.0662819
Bi: ratio chi2Mono/chi2Bi = 1.29569     d = -0.001     a =
 0.438403     a1 = 0.0548207     t1 =0.00087317     t2 = 0.784282
Long trace was used for fitting.
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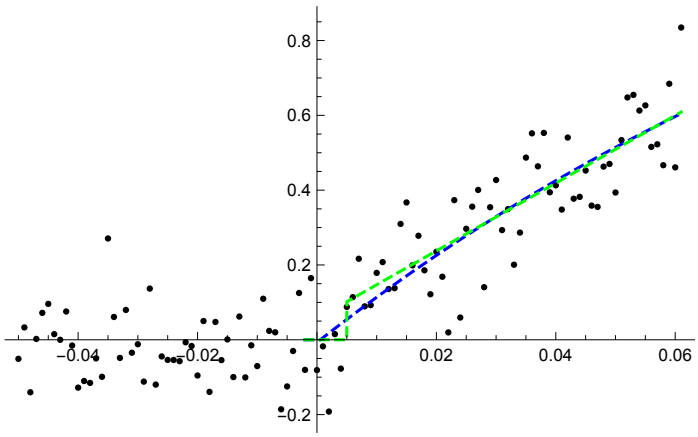


Mono: chi2 = 1.07746 d = 0.000560305 a = 1.64062 t = 0.131421

Bi: ratio chi2Mono/chi2Bi = 1.04003 d = 0.00499391 a = 204.439 a1 = 0.10172 t1 =$3.06791 \times 10^{-6}$ t2 = 22.5421

---------- C10

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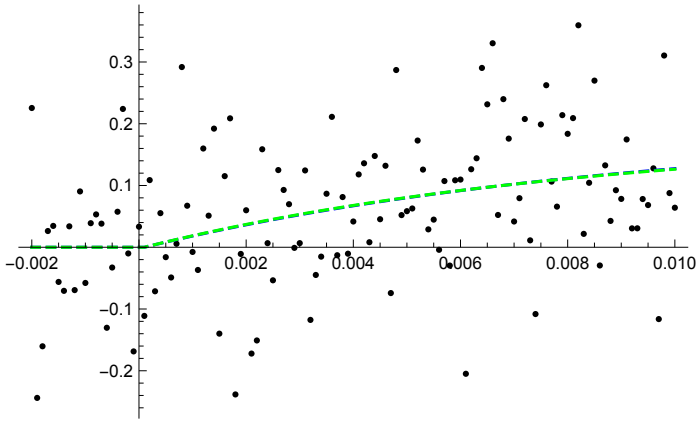


```
Mono: chi2 = 1.51613     d = 1.51613     a = 0.190579     t = 0.0089818
Bi: ratio chi2Mono/chi2Bi = 0.999965     d = 0.0001     a =
 0.669314     a1 = 0.169382     t1 =0.00801099     t2 = 0.79491
Long trace was used for fitting.
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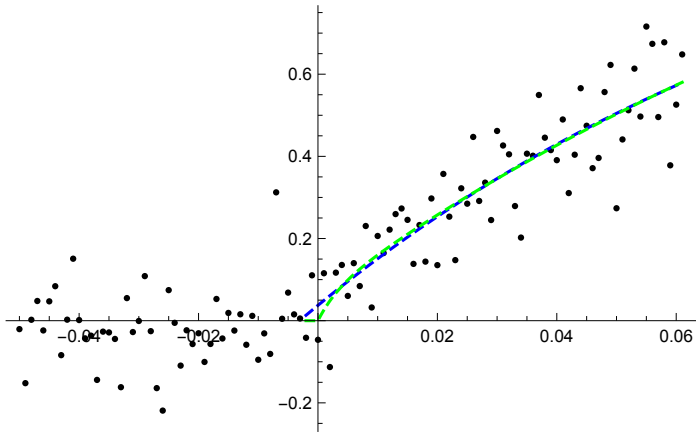


Mono: chi2 = 0.894554  d = −0.00307589  a = 1.20092  t = 0.0973702

Bi: ratio chi2Mono/chi2Bi = 1.00374  d = $-1.96849 \times 10^{-15}$

a = 1.5004  a1 = 0.0613432  t1 =0.0033902  t2 = 0.136412

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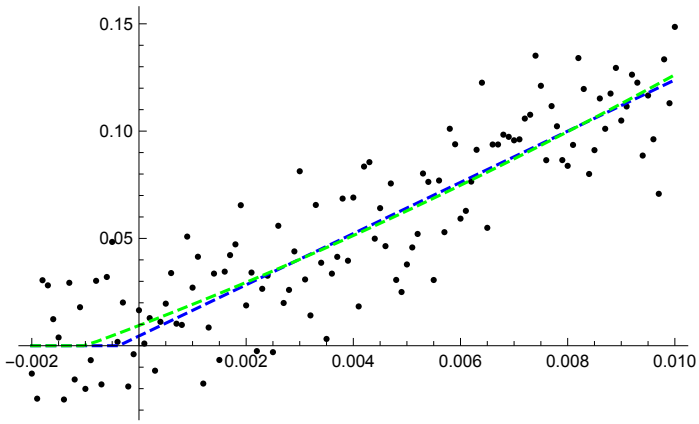


```
Mono: chi2 = 0.0534952     d = 0.0534952     a = 993 334.     t = 83 248.
Bi: ratio chi2Mono/chi2Bi = 1.00824     d = -0.001     a =
 9.08666     a1 = -14.9866     t1 =0.100406     t2 = 0.151928
Long trace was used for fitting.
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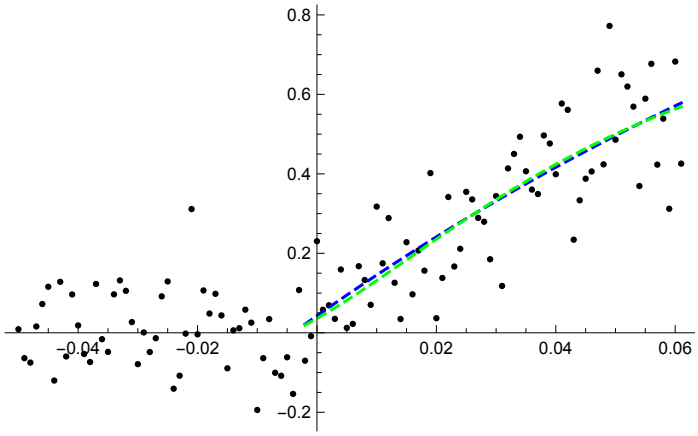


```
Mono: chi2 = 1.2462     d = -0.004     a = 1.72596     t = 0.159305
Bi: ratio chi2Mono/chi2Bi = 1.00522     d = -0.00470136     a =
 0.797901     a1 = -7.09257     t1 =0.028186     t2 = 0.0305472
-------------------------------------------------------------------------------------------
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----------------     Ca = 0.854404
  uM          -------------------------------------------------------
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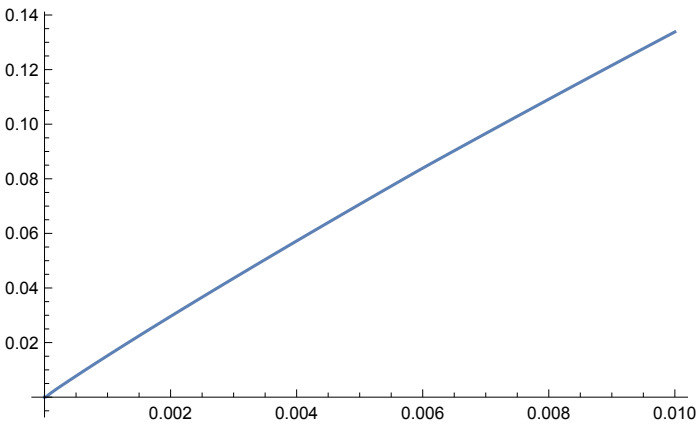

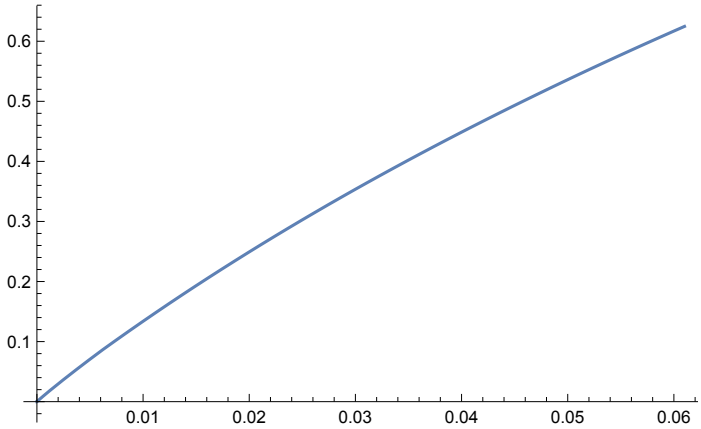


---------- C5

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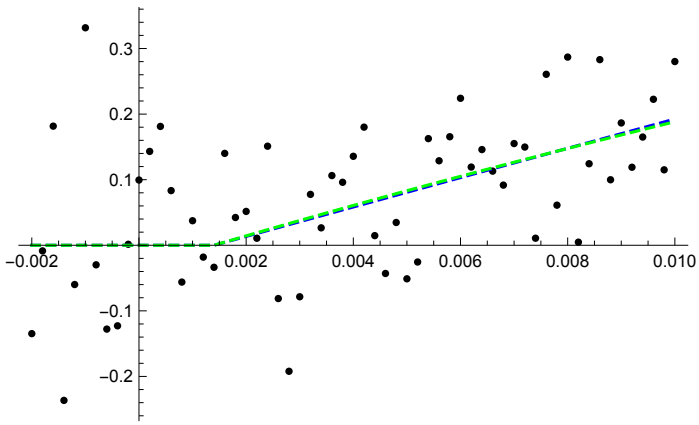


```
Mono: chi2 = 0.660714     d = 0.660714     a = 22.5304     t = 1.00247
Bi: ratio chi2Mono/chi2Bi = 0.999002     d = 0.0014     a =
 1.80063     a1 = 0.736098     t1 =0.0377745     t2 = 0.234041
Long trace was used for fitting.
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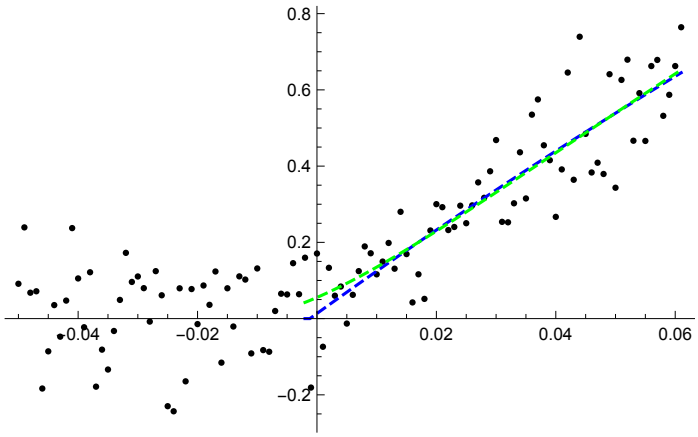


```
Mono: chi2 = 1.26002     d = -0.00119079     a = 4.06811     t = 0.360269
Bi: ratio chi2Mono/chi2Bi = 1.01042     d = -0.0141974     a =
 4.55494     a1 = -0.209248     t1 =0.0166325     t2 = 0.378052
------------------------------------------------------------------------ C10
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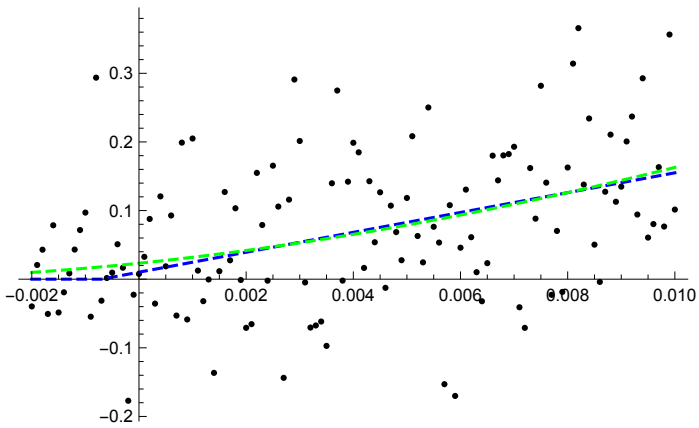

```
Mono: chi2 = 1.28252     d = 1.28252     a = 15.3273     t = 1.05284
Bi: ratio chi2Mono/chi2Bi = 1.01037     d = -0.00578349     a =
 9.40562     a1 = -11.1163     t1 =0.0578258     t2 = 0.106849
Long trace was used for fitting.
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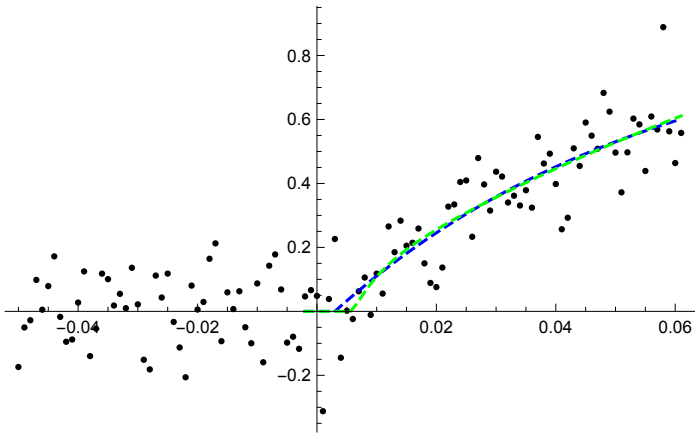


```
Mono: chi2 = 1.26002     d = 0.00299506     a = 0.921469     t = 0.0548519
Bi: ratio chi2Mono/chi2Bi = 1.00854     d = 0.006     a =
 1.48793     a1 = 0.111991     t1 =0.0047133     t2 = 0.122132
------------------------------------------------------------------------- D
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LinearAlgebra`BLAS`TRSV: Machine overflow encountered during computations.

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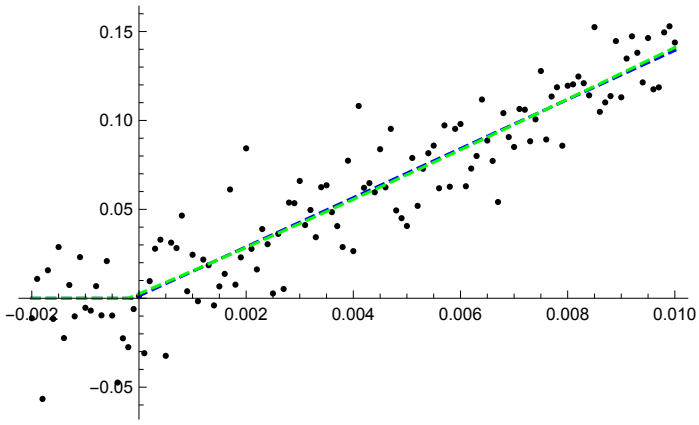


Mono: chi2 = 0.0452279 d = 0.0452279 a = $5.48155 \times 10^6$ t = 396 917.

Bi: ratio chi2Mono/chi2Bi = 1.00276 d = −0.0002 a = 1.6146 a1 = −0.268541 t1 =0.0198966 t2 = 0.0719998

Long trace was used for fitting.

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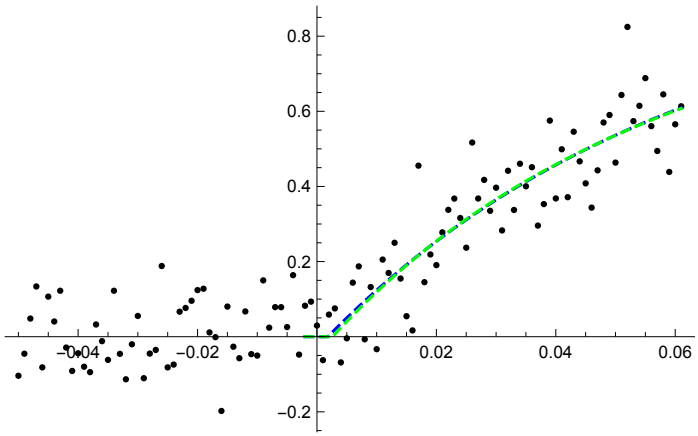


```
Mono: chi2 = 0.936636     d = 0.00181969     a = 0.972639     t = 0.060104
Bi: ratio chi2Mono/chi2Bi = 1.00035     d = 0.00259233     a =
 1.68453     a1 = 0.626379     t1 =0.0424429     t2 = 0.413423
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```

---------- Ca = 0.890526
uM ----------
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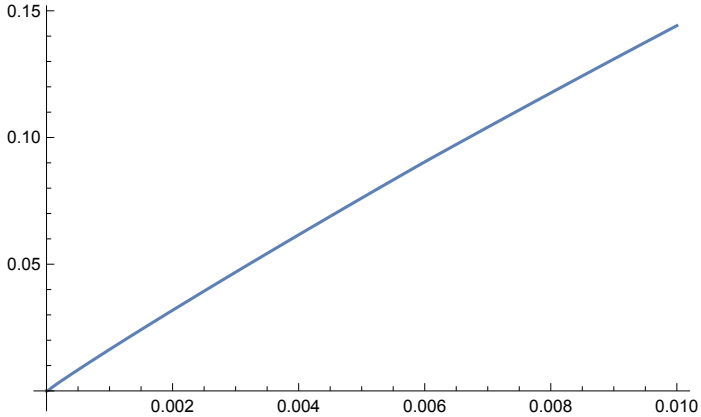


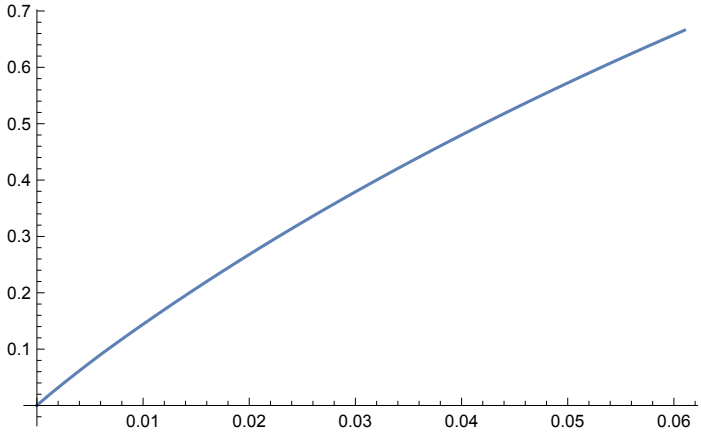


---------- C5

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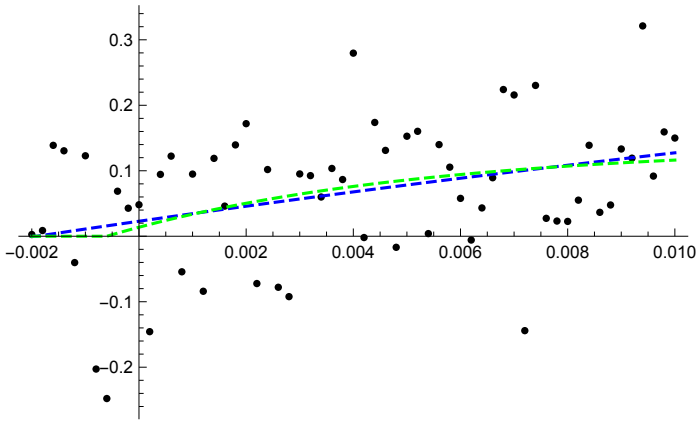


```
Mono: chi2 = 0.618601     d = 0.618601     a = 0.517952     t = 0.0421719
Bi: ratio chi2Mono/chi2Bi = 1.01324     d = -0.0006     a =
 -0.432618     a1 = 0.131787     t1 =0.00553428     t2 = -1.53185
Long trace was used for fitting.
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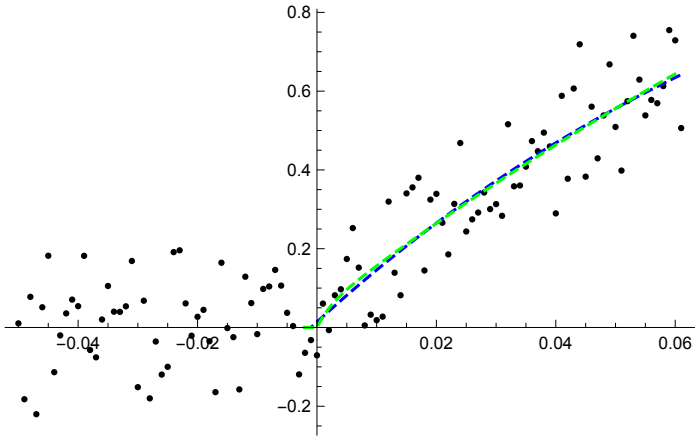


Mono: chi2 = 1.14931 d = -0.001 a = 1.35258 t = 0.096354

Bi: ratio chi2Mono/chi2Bi = 1.00343 d = $3.12069 \times 10^{-16}$ a = 2.36903 a1 = 0.0444676 t1 =0.00234271 t2 = 0.201284

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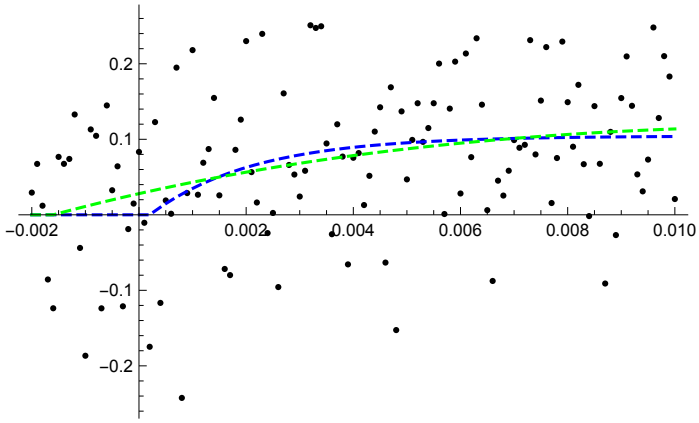


```
Mono: chi2 = 1.11448     d = 1.11448     a = 0.104372     t = 0.00195984
Bi: ratio chi2Mono/chi2Bi = 0.989862     d = -0.0016     a =
 1.72045     a1 = 0.376356     t1 =0.0136518     t2 = -0.158981
Long trace was used for fitting.
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FittedModel: The sum of squared errors is not a non−negative number. The model may suffer from significant numerical error or may not be appropriate for the data.

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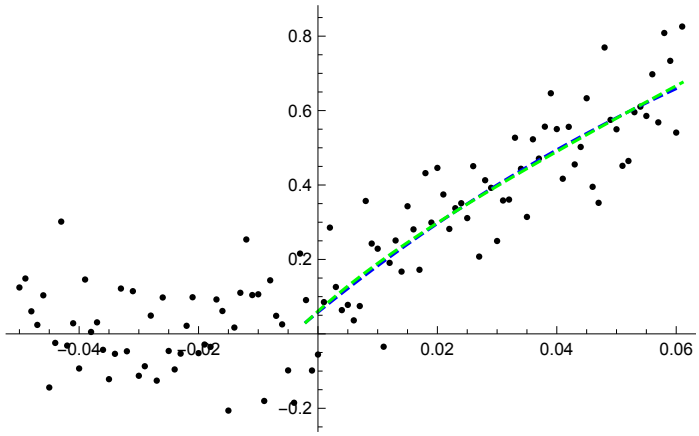


```
Mono: chi2 = 1.27853     d = -0.00435729     a = 1.4669     t = 0.10788

Bi: ratio chi2Mono/chi2Bi = 1.0039     d = -0.004     a =
 5.77365     a1 = 0.0895972     t1 =0.0135609     t2 = 0.597002

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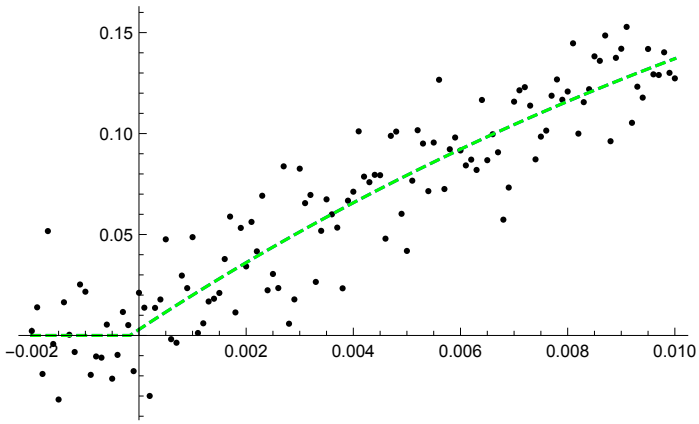


```
Mono: chi2 = 0.0432638     d = 0.0432638     a = 0.315839     t = 0.0178549
Bi: ratio chi2Mono/chi2Bi = 1.     d = -0.000169194     a =
 0.913905     a1 = 0.390079     t1 =0.0202322     t2 = -0.317825
Long trace was used for fitting.
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LinearAlgebra`BLAS`TRSV: Machine overflow encountered during computations.

General: Further output of LinearAlgebra`BLAS`TRSV::oflow will be suppressed during this calculation.

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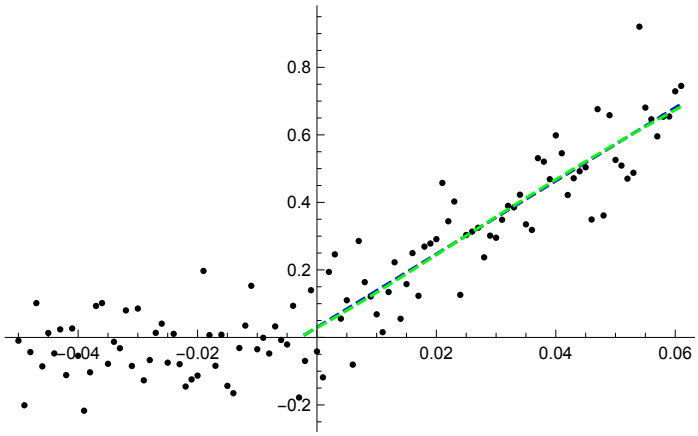


Mono: chi2 = 1.06516  d = -0.00278025  a = $4.16305 \times 10^{7}$  t = $3.84094 \times 10^{6}$

Bi: ratio chi2Mono/chi2Bi = 0.996864  d = -0.003  a = 2.01057  a1 = -0.157084  t1 =0.0221611  t2 = 0.132183

---

---  Ca = 0.928936

uM  ---

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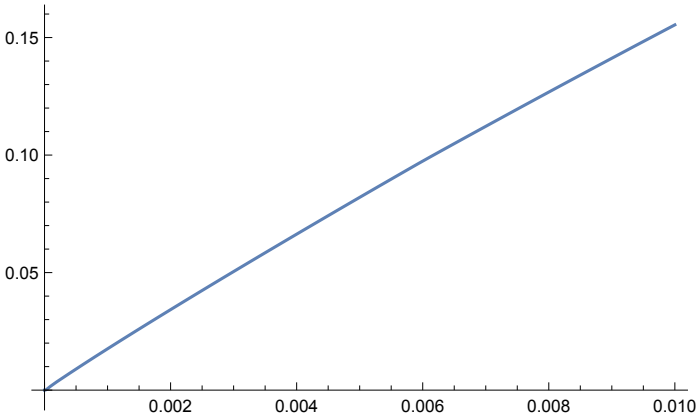

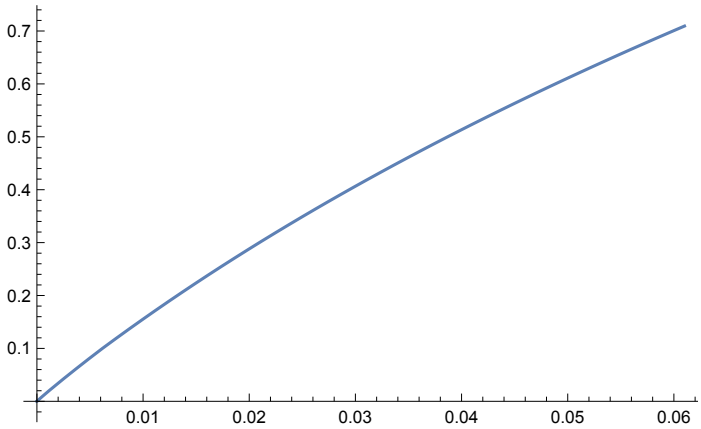


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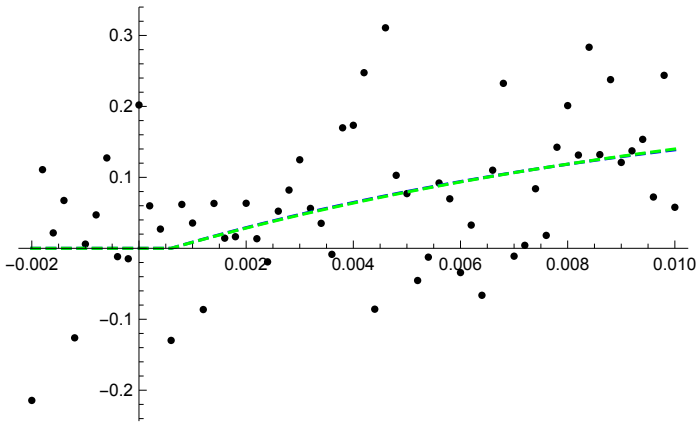


```
Mono: chi2 = 0.524381     d = 0.524381     a = 0.238454     t = 0.0107692
Bi: ratio chi2Mono/chi2Bi = 1.00018     d = 0.0006     a =
 -1.00823     a1 = 0.229574     t1 =0.0110884     t2 = -1.33542
Long trace was used for fitting.
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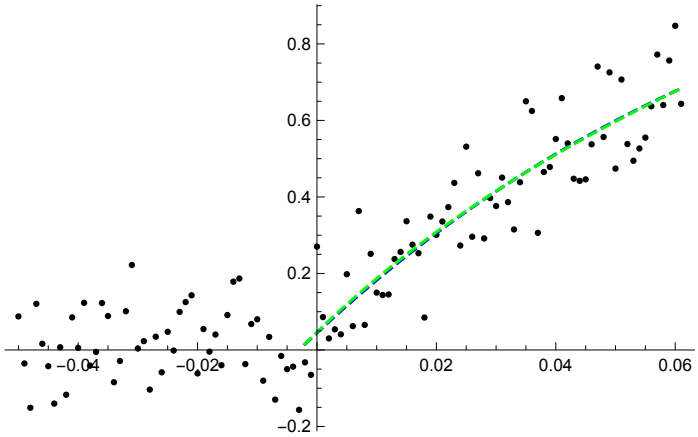


```
Mono: chi2 = 1.01471     d = -0.003     a = 1.30741     t = 0.0864791
Bi: ratio chi2Mono/chi2Bi = 1.00132     d = -0.003     a =
 1.75385     a1 = 0.141537     t1 =0.0269786     t2 = 0.15161
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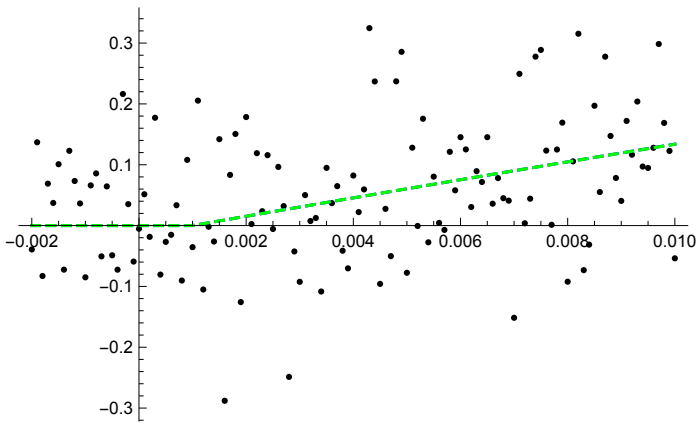

```
Mono: chi2 = 1.36623     d = 1.36623     a = 2.32075     t = 0.151548
Bi: ratio chi2Mono/chi2Bi = 0.999996     d = 0.001     a =
 2.92632     a1 = 1.01228     t1 =0.10102     t2 = 0.359077
Long trace was used for fitting.
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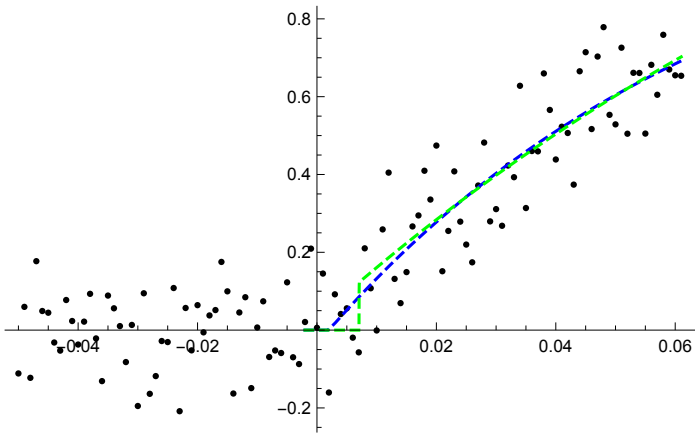


```
Mono: chi2 = 1.16337     d = 0.002     a = 1.18923     t = 0.0676881
Bi: ratio chi2Mono/chi2Bi = 1.02077     d = 0.00703963     a =
 1.87136     a1 = 0.122617     t1 =0.00001346     t2 = 0.133999
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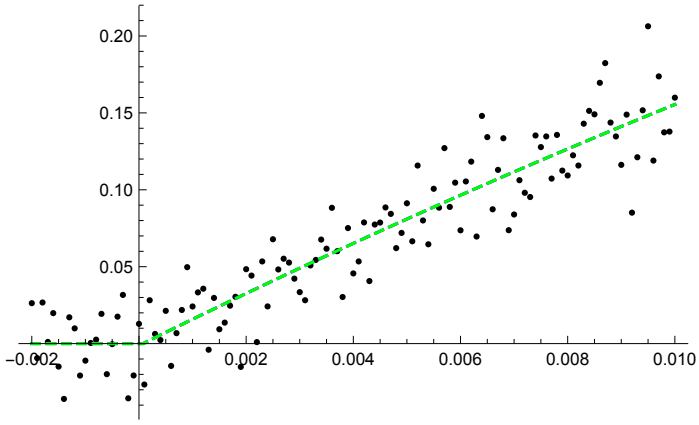


```
Mono: chi2 = 0.051556     d = 0.051556     a = 0.869032     t = 0.0503597

Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.0000746945     a =
 0.73287     a1 = 0.885431     t1 =0.050836     t2 = 0.945198

Long trace was used for fitting.

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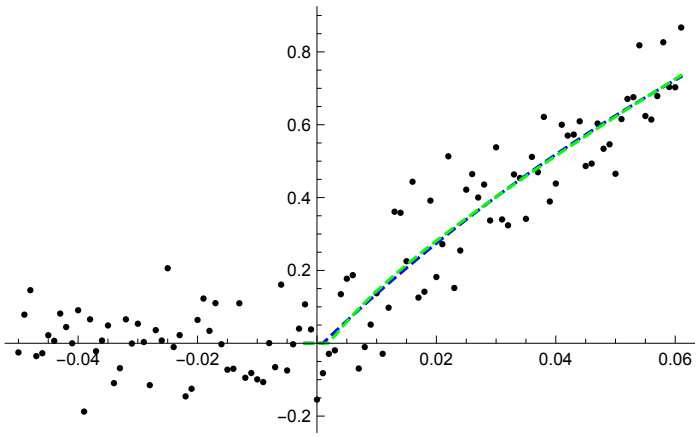


```
Mono: chi2 = 0.975618     d = 0.001     a = 1.78944     t = 0.114058
Bi: ratio chi2Mono/chi2Bi = 1.0051     d = 0.002     a =
 3.35411     a1 = 0.0683858     t1 =0.00786936     t2 = 0.260004
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----------------     Ca = 0.968962
  uM          -------------------------------------------------------
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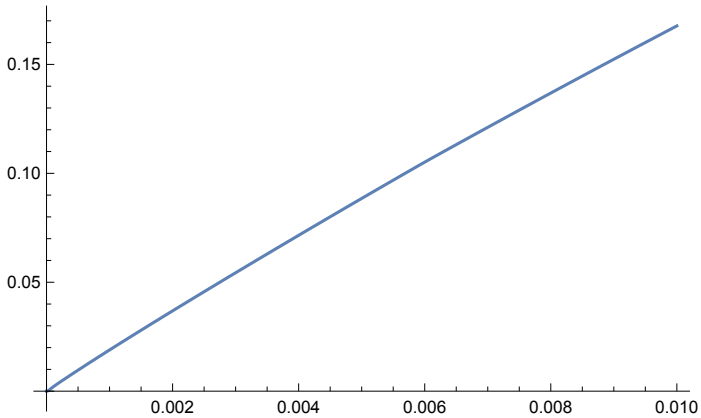


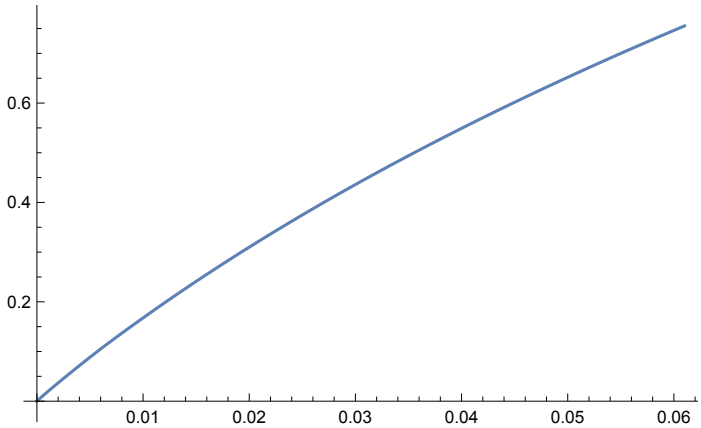


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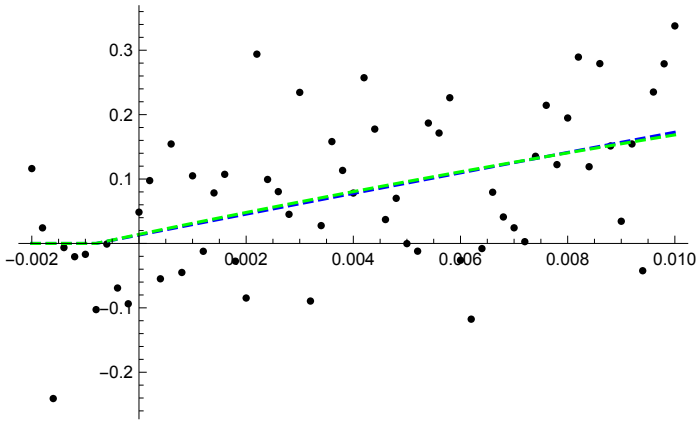


```
Mono: chi2 = 0.659449     d = 0.659449     a = 4.06207     t = 0.248633
Bi: ratio chi2Mono/chi2Bi = 0.999054     d = -0.0008     a =
 -1.23318     a1 = 0.554019     t1 =0.0351684     t2 = -0.880932
Long trace was used for fitting.
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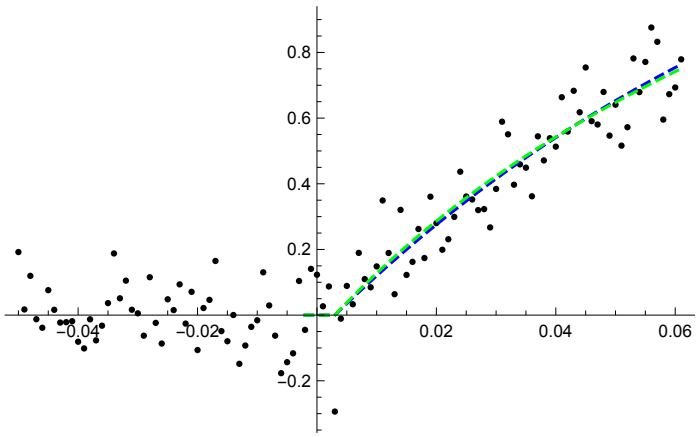


```
Mono: chi2 = 0.900266     d = 0.003     a = 1.62961     t = 0.0917729
Bi: ratio chi2Mono/chi2Bi = 0.998571     d = 0.003     a =
 1.73441     a1 = 0.194068     t1 =0.0288959     t2 = 0.122117
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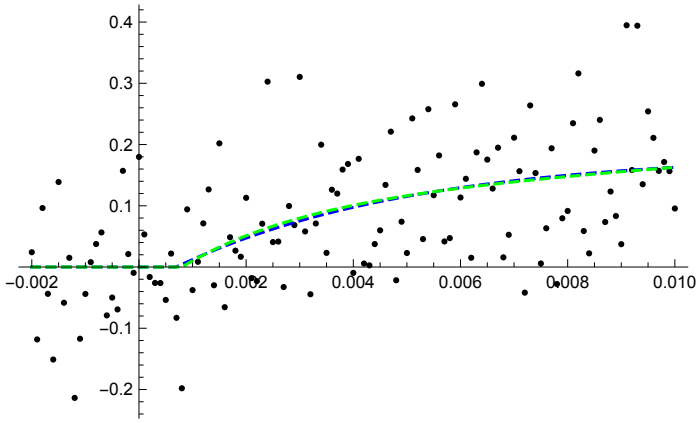


```
Mono: chi2 = 1.09675     d = 1.09675     a = 0.18525     t = 0.00440797
Bi: ratio chi2Mono/chi2Bi = 1.00291     d = 0.0008     a =
 -1.47315     a1 = 0.109595     t1 =0.00233673     t2 = -0.26748
Long trace was used for fitting.
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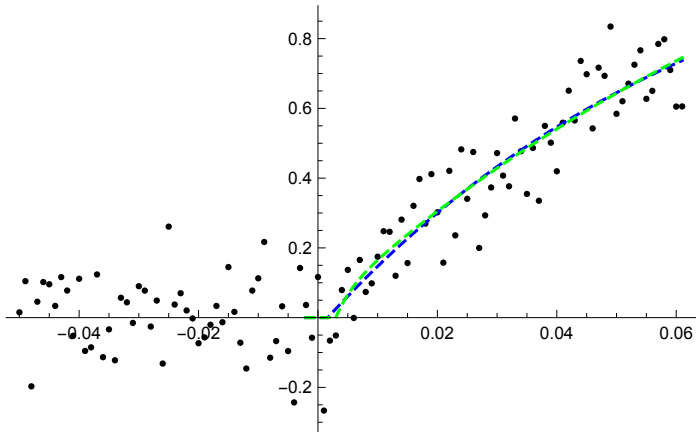


```
Mono: chi2 = 1.08186     d = 0.00163318     a = 1.25571     t = 0.0671113

Bi: ratio chi2Mono/chi2Bi = 1.00667     d = 0.003     a =
 1.67926     a1 = 0.0664851     t1 =0.00259465     t2 = 0.106203

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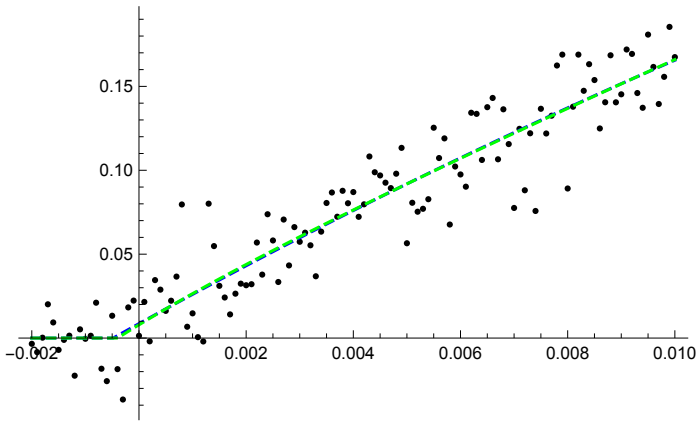


```
Mono: chi2 = 0.0447082     d = 0.0447082     a = 0.733287     t = 0.0409472
Bi: ratio chi2Mono/chi2Bi = 1.00227     d = -0.0004     a =
 1.81899     a1 = 0.00995385     t1 =0.00223088     t2 = 0.115244
Long trace was used for fitting.
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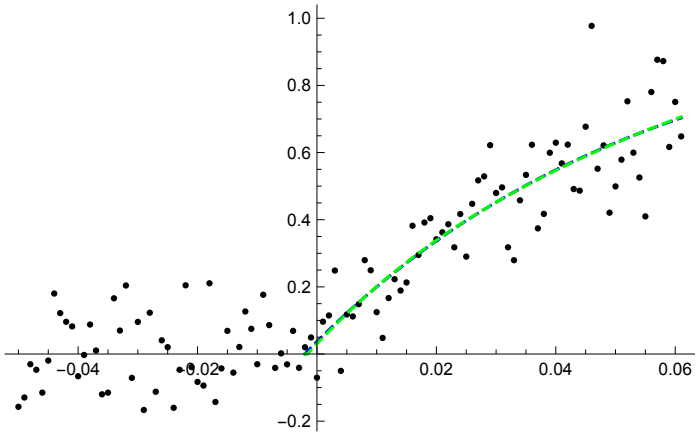


```
Mono: chi2 = 1.31582     d = -0.0020262     a = 1.04993     t = 0.0568866
Bi: ratio chi2Mono/chi2Bi = 1.00022     d = -0.00158852
      a = 8.07046     a1 = 0.539593     t1 =0.0348257     t2 = 1.81137
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----------------     Ca = 1.01226
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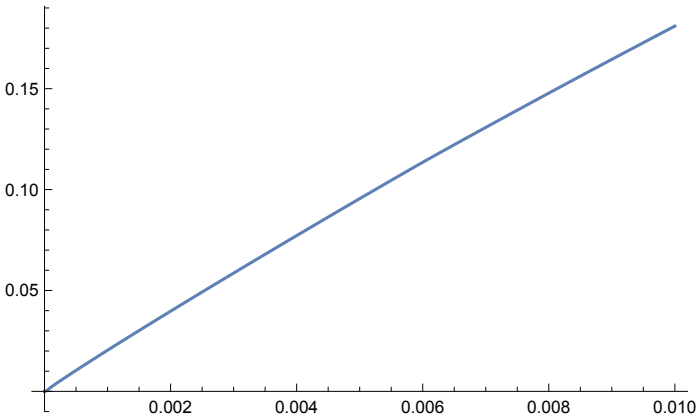

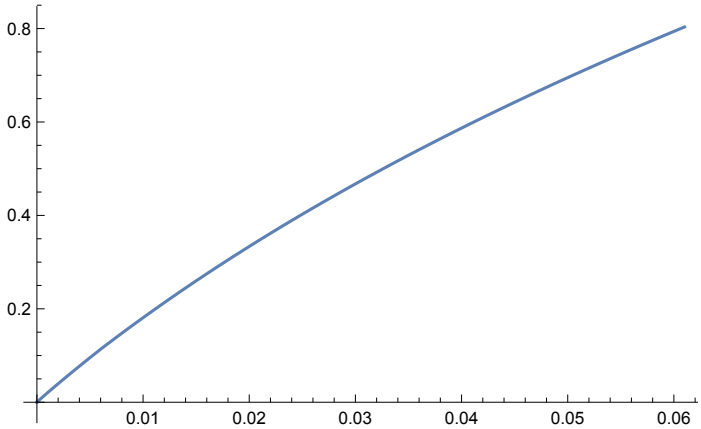


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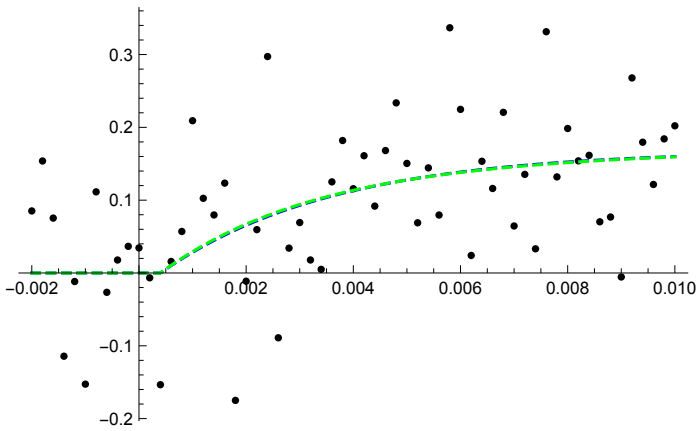


```
Mono: chi2 = 0.524406     d = 0.524406     a = 0.168609     t = 0.00324455
Bi: ratio chi2Mono/chi2Bi = 0.999643     d = 0.0004     a =
 0.790883     a1 = 0.154144     t1 =0.00290988     t2 = 0.549533
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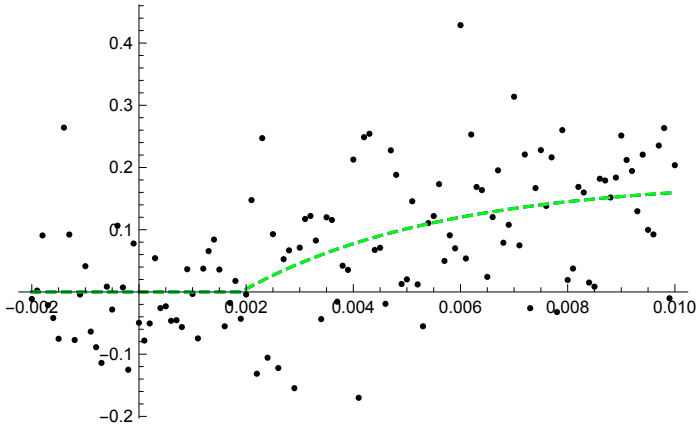


```
Mono: chi2 = 1.07177     d = 1.07177     a = 0.180349     t = 0.00374103
Bi: ratio chi2Mono/chi2Bi = 0.999984     d = 0.0019     a =
 0.578437     a1 = 0.173769     t1 =0.0036382     t2 = 0.660262
Long trace was used for fitting.
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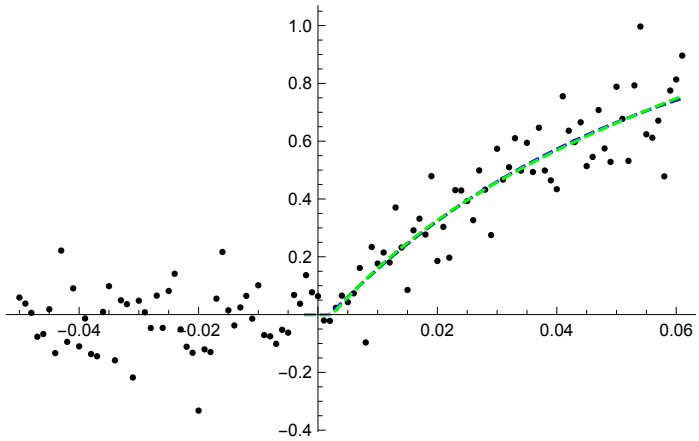


```
Mono: chi2 = 1.22378     d = 0.002     a = 1.09691     t = 0.0514711

Bi: ratio chi2Mono/chi2Bi = 1.00065     d = 0.00230677
      a = 15.7672     a1 = 0.400848     t1 =0.0241955     t2 = 2.2774

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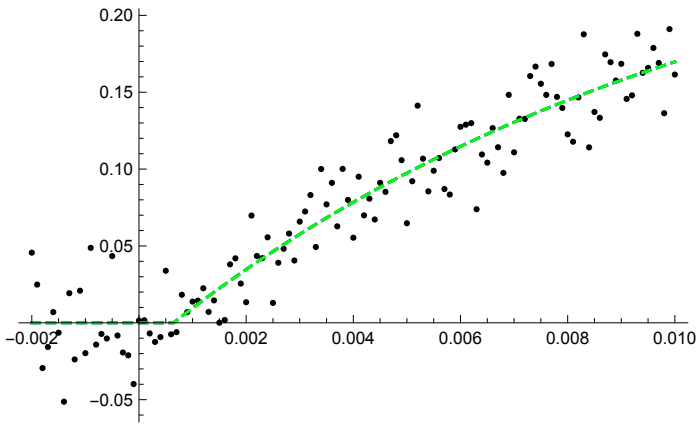


```
Mono: chi2 = 0.048316     d = 0.048316     a = 0.290897     t = 0.01068
Bi: ratio chi2Mono/chi2Bi = 0.999992     d = 0.000642593     a =
 0.422533     a1 = 0.292958     t1 =0.0107283     t2 = -1.65457
Long trace was used for fitting.
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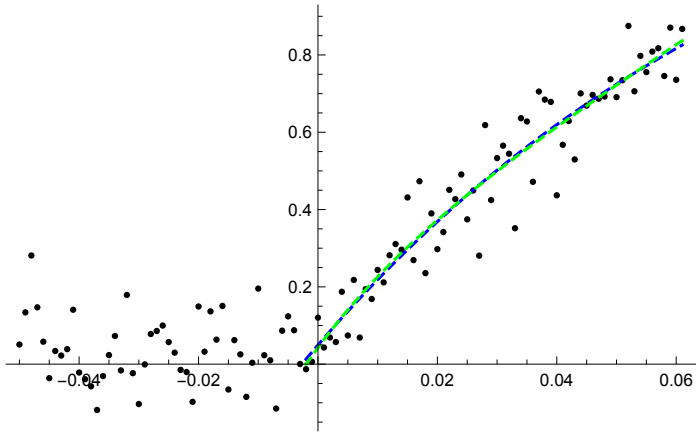


```
Mono: chi2 = 0.772724     d = -0.00269786     a = 1.53859     t = 0.0828353
Bi: ratio chi2Mono/chi2Bi = 1.00316     d = -0.00194546
      a = 33.0011     a1 = 0.203415     t1 =0.016693     t2 = 3.20379
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  --------------------------
----------------     Ca = 1.05883
  uM          -------------------------------------------------------
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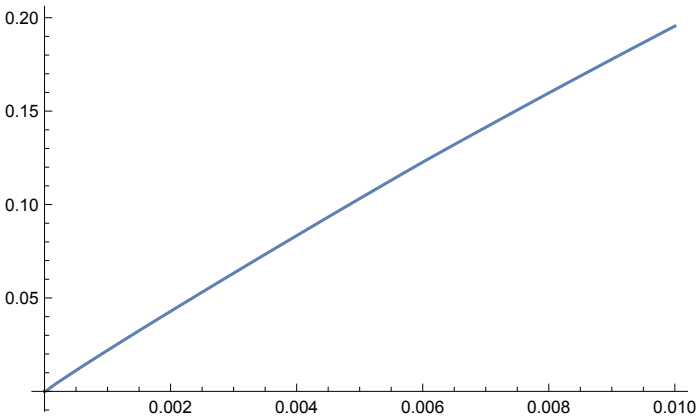

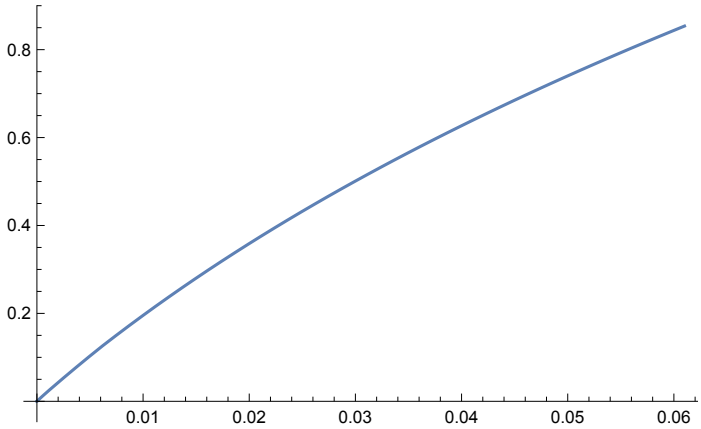


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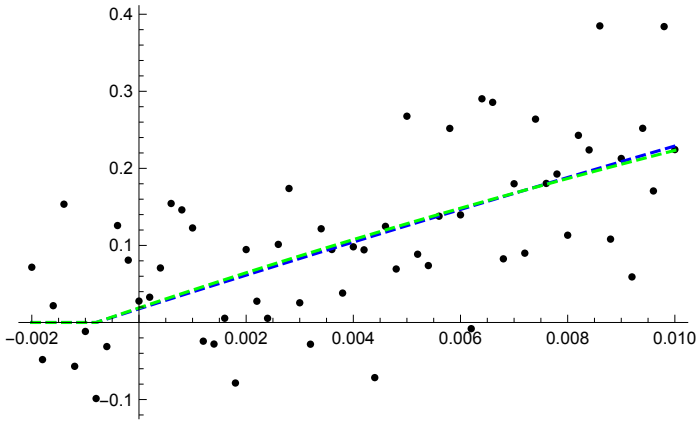


```
Mono: chi2 = 0.429954     d = 0.429954     a = 2.62049     t = 0.118093
Bi: ratio chi2Mono/chi2Bi = 0.992975     d = -0.0008
      a = 1.55778     a1 = 0.4976     t1 =0.0275055     t2 = 0.17998
Long trace was used for fitting.
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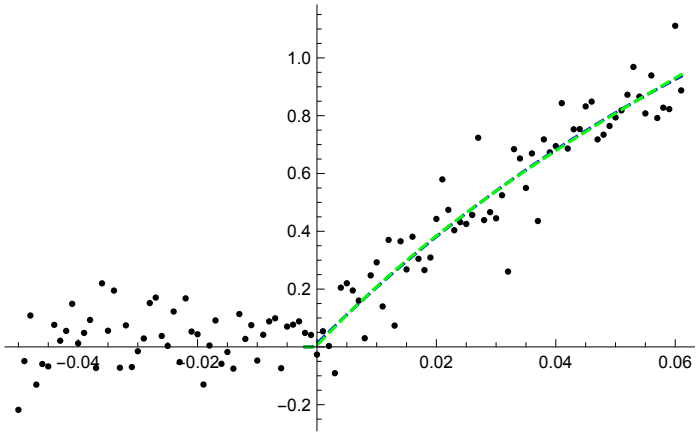


```
Mono: chi2 = 1.02573     d = -0.000553567     a = 1.97309     t = 0.0956434
Bi: ratio chi2Mono/chi2Bi = 1.00031     d = -0.000245355     a =
 0.334723     a1 = 0.815467     t1 =0.045932     t2 = -0.114135
------------------------------------------------------------------------- C10
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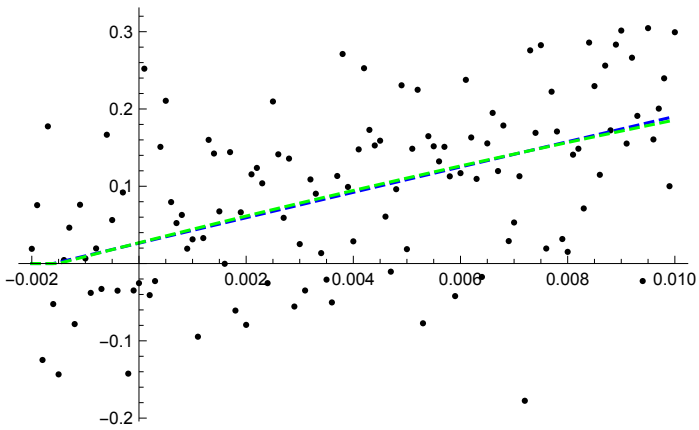

```
Mono: chi2 = 1.07892     d = 1.07892     a = 16.4583     t = 0.997085
Bi: ratio chi2Mono/chi2Bi = 0.998862     d = -0.0015     a =
 1.10058     a1 = 0.883337     t1 =0.0477342     t2 = -0.752624
Long trace was used for fitting.
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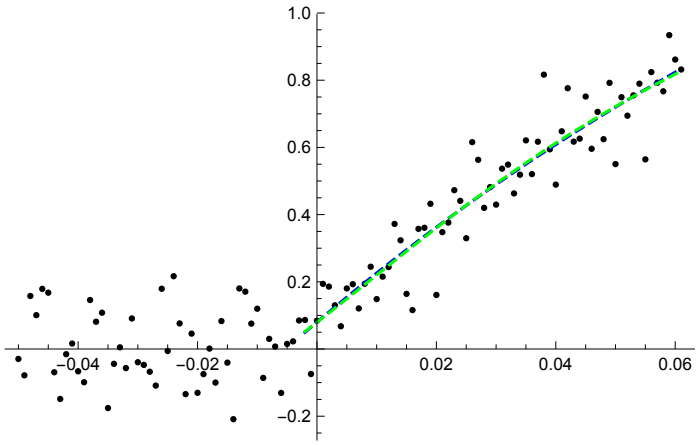


```
Mono: chi2 = 1.01047     d = -0.00520332     a = 2.29546     t = 0.146725
Bi: ratio chi2Mono/chi2Bi = 1.00294     d = -0.006     a =
 1.50134     a1 = -0.188442     t1 =0.0181598     t2 = 0.0734892
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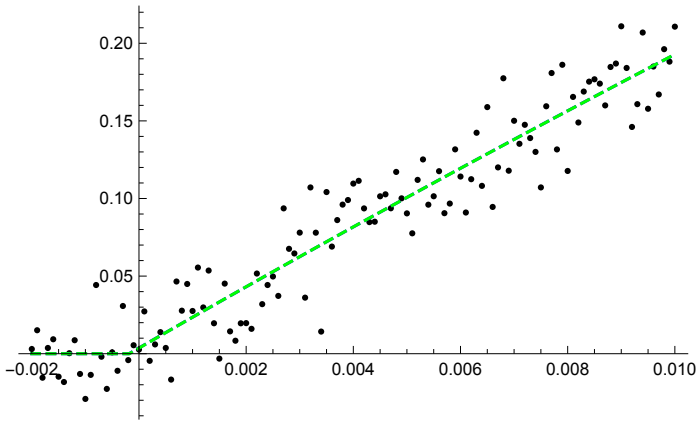


Mono: chi2 = 0.0484365 d = 0.0484365 a = 1.94523 t = 0.0976007

Bi: ratio chi2Mono/chi2Bi = 1.00002 d = -0.00017938 a = 8.15888 a1 = 0.0285282 t1 =0.0106365 t2 = 0.467003

Long trace was used for fitting.

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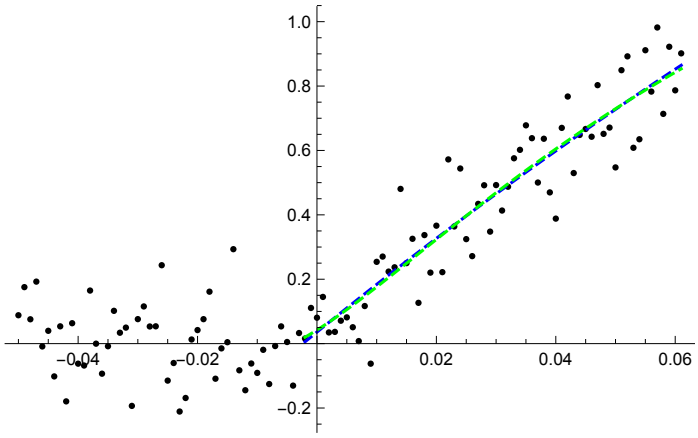


```
Mono: chi2 = 1.28806     d = -0.00237674     a = 4.4367     t = 0.292426
Bi: ratio chi2Mono/chi2Bi = 1.00263     d = -0.004     a =
 1.85754     a1 = -0.154668     t1 =0.0126676     t2 = 0.0936263
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----------------     Ca = 1.10833
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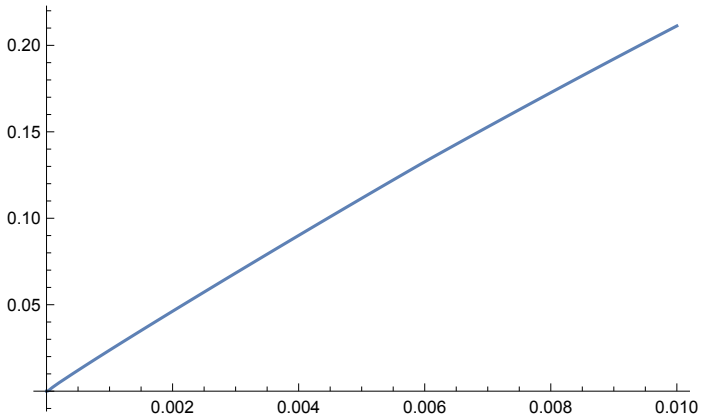


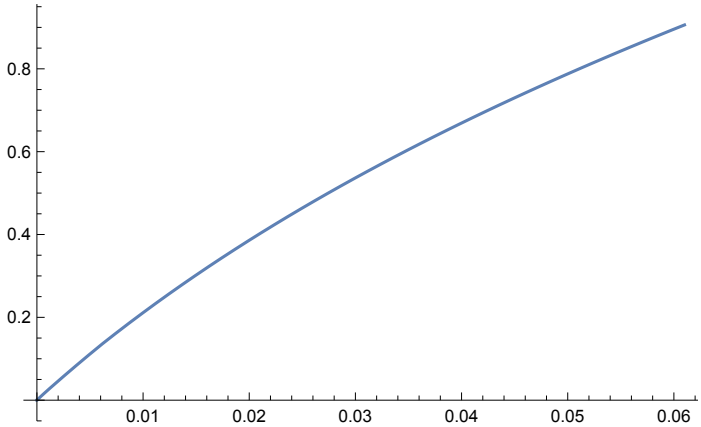


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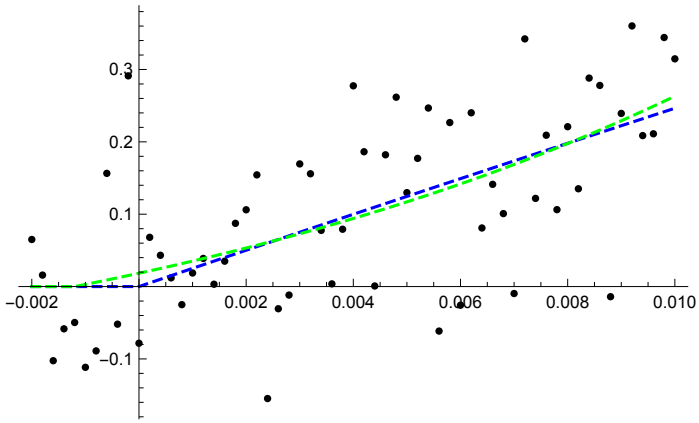


```
Mono: chi2 = 0.628845     d = 0.628845     a = 5.65335     t = 0.224383
Bi: ratio chi2Mono/chi2Bi = 1.01406     d = -0.0012     a =
 -0.0285487     a1 = 0.156116     t1 =1.84414     t2 = -0.012675
Long trace was used for fitting.
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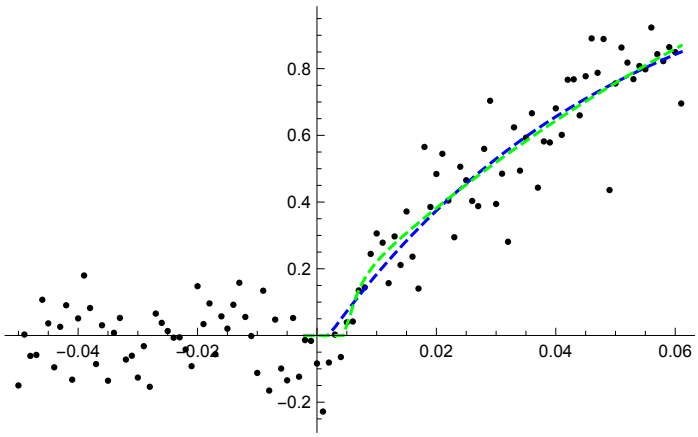


```
Mono: chi2 = 1.10215     d = 0.00200398     a = 1.20871     t = 0.048568
Bi: ratio chi2Mono/chi2Bi = 1.02445     d = 0.00479774     a =
 1.86096     a1 = 0.145693     t1 =0.00194827     t2 = 0.102616
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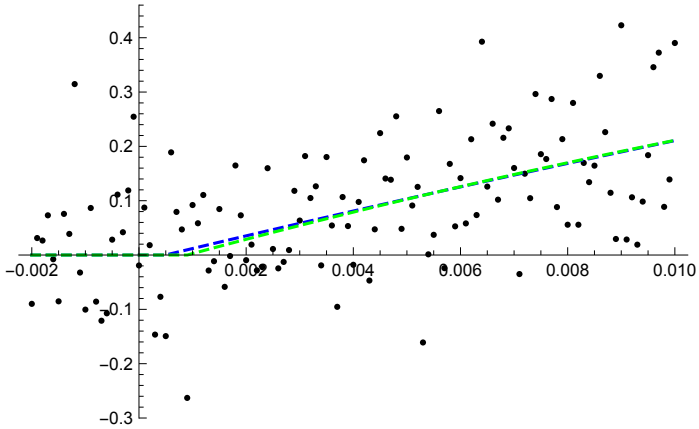


```
Mono: chi2 = 1.35981     d = 1.35981     a = 1.68493     t = 0.071194
Bi: ratio chi2Mono/chi2Bi = 0.999665     d = 0.0009     a =
 1.3353     a1 = 0.762449     t1 =0.0297084     t2 = 0.51906
Long trace was used for fitting.
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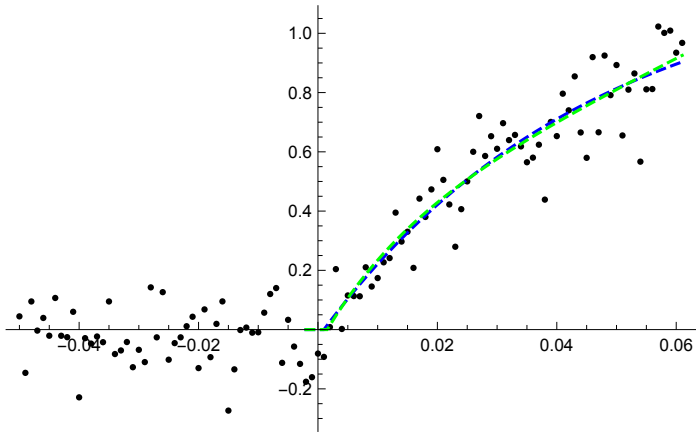


```
Mono: chi2 = 1.08452     d = 0.001     a = 1.23031     t = 0.0452769

Bi: ratio chi2Mono/chi2Bi = 1.00962     d = 0.00156297     a =
 32.6711     a1 = 0.336594     t1 =0.0143559     t2 = 3.20466

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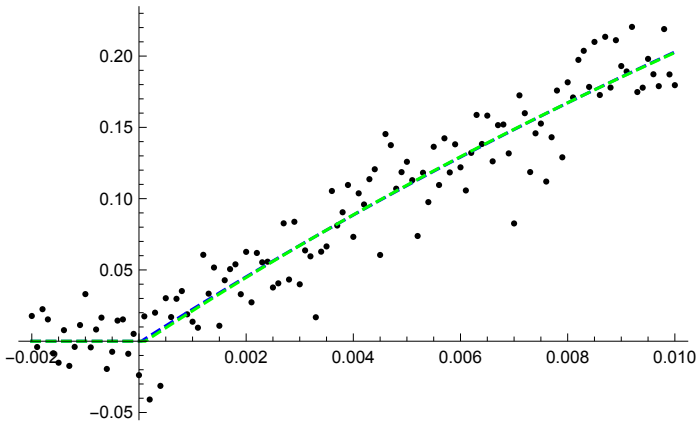


```
Mono: chi2 = 0.0509974     d = 0.0509974     a = 0.736322     t = 0.0308873
Bi: ratio chi2Mono/chi2Bi = 0.999703     d = 0.000116519
      a = 2.95316     a1 = 0.39147     t1 =0.020138     t2 = 0.495242
Long trace was used for fitting.
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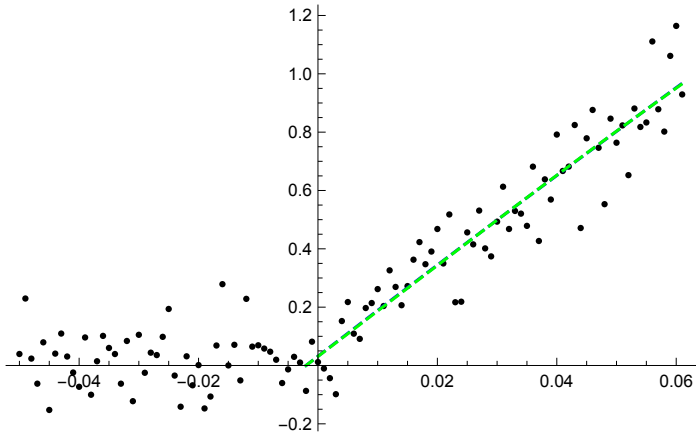


```
Mono: chi2 = 1.1049     d = -0.002     a = 16.5437     t = 1.04556
Bi: ratio chi2Mono/chi2Bi = 0.997734     d = -0.002     a =
 4.17942     a1 = -0.761362     t1 =0.0678304     t2 = 0.184965
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----------------     Ca = 1.16077
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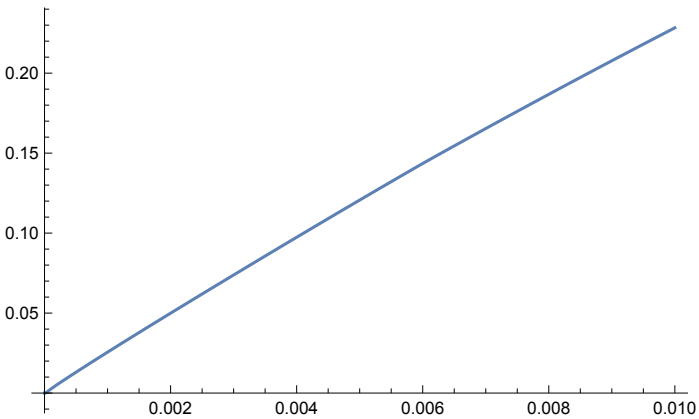

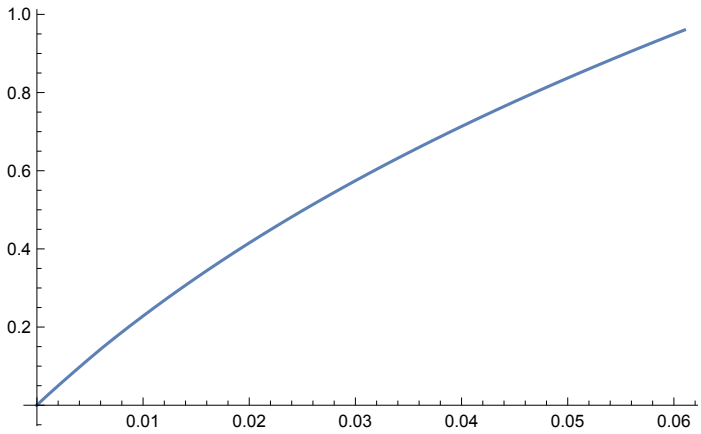


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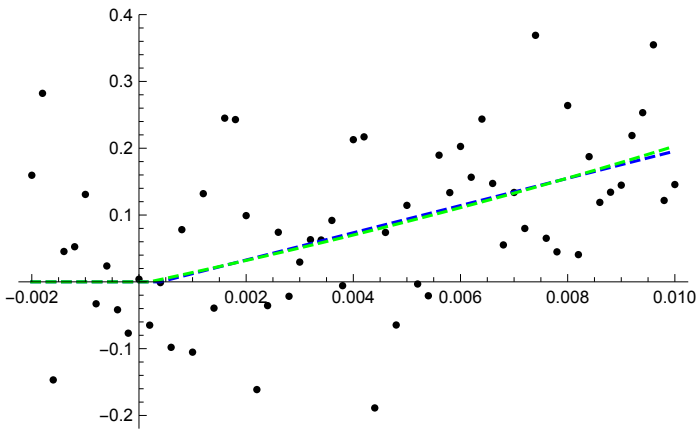


Mono: chi2 = 0.709696 d = 0.709696 a = $1.191 \times 10^{7}$ t = 584 353.

Bi: ratio chi2Mono/chi2Bi = 1.00188 d = 0.0002 a = 0.398842 a1 = 0.603239 t1 =0.102147 t2 = −0.0179865

Long trace was used for fitting.

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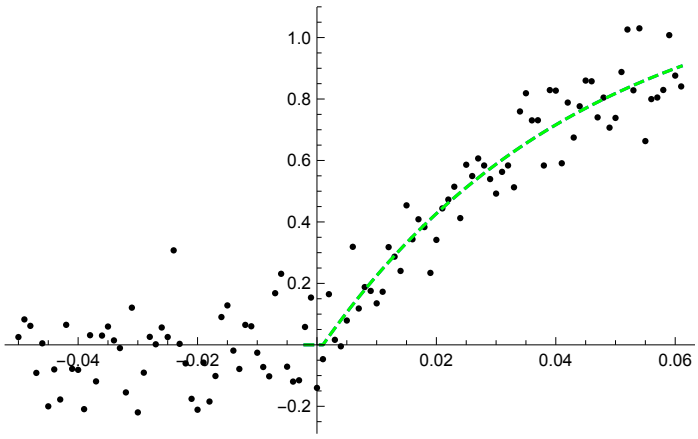


```
Mono: chi2 = 1.19345     d = 0.001     a = 1.21926     t = 0.0440661
Bi: ratio chi2Mono/chi2Bi = 0.999965     d = 0.001     a =
 1.22241     a1 = 0.531061     t1 =0.0410307     t2 = 0.0469192
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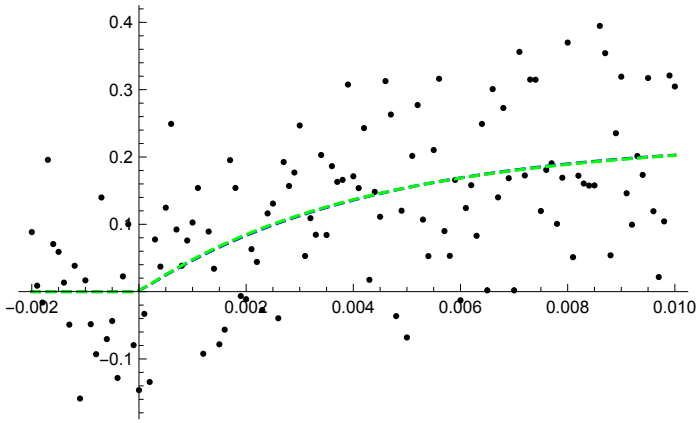


Mono: chi2 = 1.19913 d = 1.19913 a = 0.224757 t = 0.00430495

Bi: ratio chi2Mono/chi2Bi = 1.00022 d = $3.08563 \times 10^{-16}$

a = 0.860163 a1 = 0.20347 t1 =0.0038851 t2 = 0.450215

Long trace was used for fitting.

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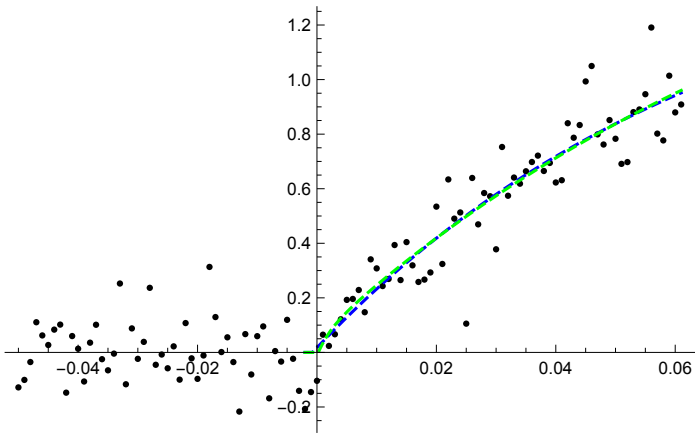


```
Mono: chi2 = 1.36532     d = -0.000740314     a = 1.60099     t = 0.0684417
Bi: ratio chi2Mono/chi2Bi = 1.00589     d = 0.00023423     a =
 1.94153     a1 = 0.0600752     t1 =0.00199959     t2 = 0.0933469
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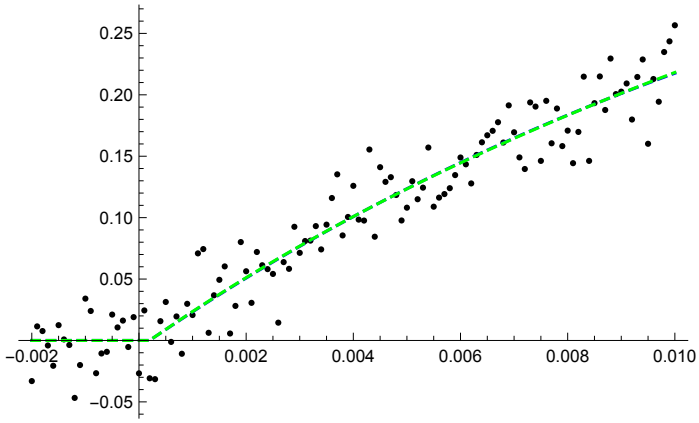


```
Mono: chi2 = 0.0558222     d = 0.0558222     a = 0.46676     t = 0.0156145
Bi: ratio chi2Mono/chi2Bi = 1.00208     d = 0.0002     a =
 -2.82789     a1 = 0.204681     t1 =0.00944052     t2 = -0.350409
Long trace was used for fitting.
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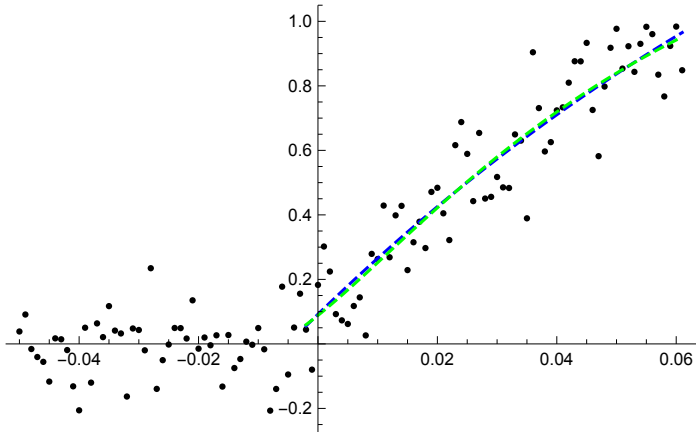


Mono: chi2 = 1.14131  d = -0.005  a = 2.38368  t = 0.127159

Bi: ratio chi2Mono/chi2Bi = 1.00883  d = -0.007  a = 1.48995  a1 = -0.272758  t1 =0.0129549  t2 = 0.057472

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---  Ca = 1.21664

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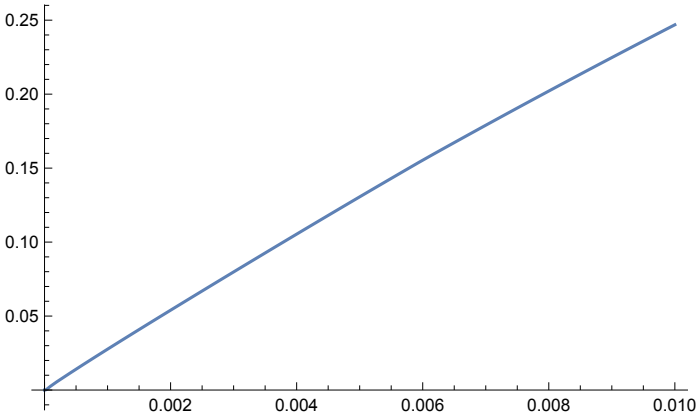


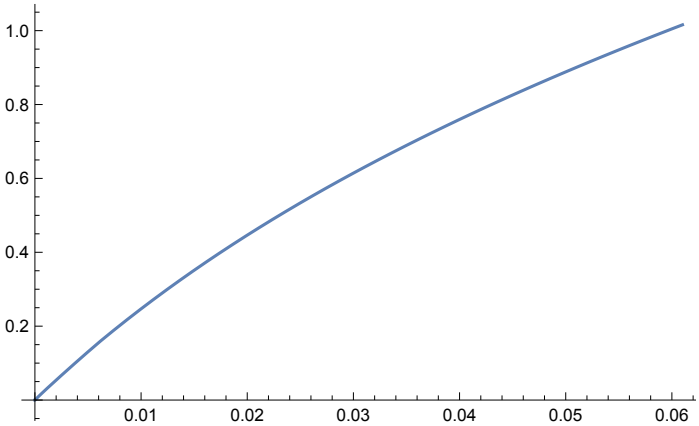


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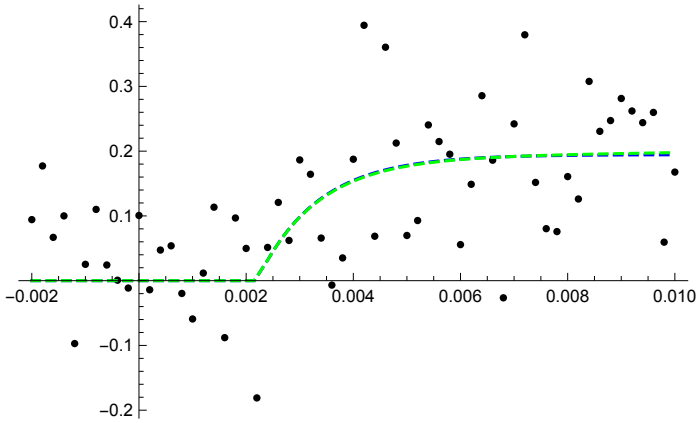


```
Mono: chi2 = 0.542771     d = 0.542771     a = 0.194605     t = 0.00113461
Bi: ratio chi2Mono/chi2Bi = 1.00065     d = 0.0022     a =
 0.745785     a1 = 0.188453     t1 =0.00110853     t2 = 0.45577
Long trace was used for fitting.
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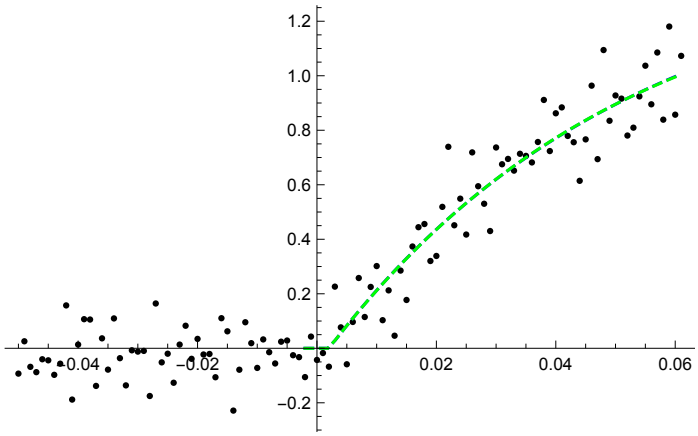


```
Mono: chi2 = 1.11344     d = 0.00202854     a = 1.46733     t = 0.0509418

Bi: ratio chi2Mono/chi2Bi = 1.00059     d = 0.002     a =
 0.997338     a1 = 2.3533     t1 =0.063546     t2 = 0.159578

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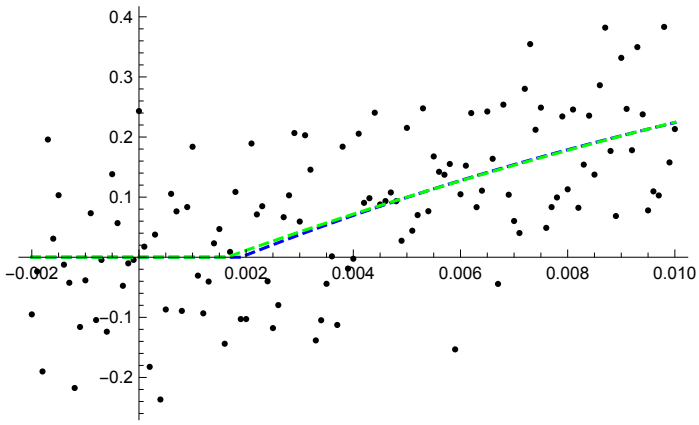


```
Mono: chi2 = 1.34497     d = 1.34497     a = 0.556665     t = 0.015738
Bi: ratio chi2Mono/chi2Bi = 0.999908     d = 0.00163826     a =
 0.915813     a1 = 0.751828     t1 =0.023469     t2 = -1.66303
Long trace was used for fitting.
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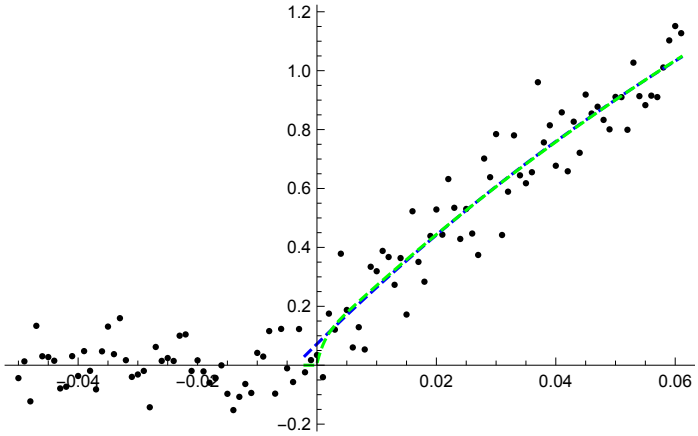


```
Mono: chi2 = 0.898322     d = -0.00357617     a = 2.69983     t = 0.131867
Bi: ratio chi2Mono/chi2Bi = 1.00747     d = -0.0000598197
      a = 3.0469     a1 = 0.0851039     t1 =0.00124249     t2 = 0.15543
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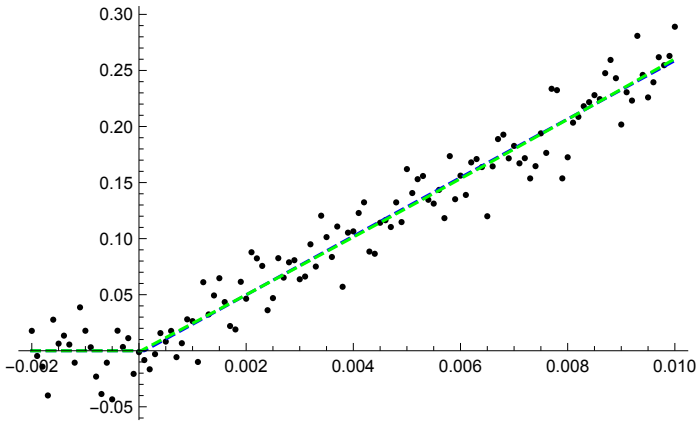


```
Mono: chi2 = 0.0477383     d = 0.0477383     a = 33.1049     t = 1.26149

Bi: ratio chi2Mono/chi2Bi = 1.00146     d = 0.0000379641
      a = 1.8507     a1 = 1.99148     t1 =0.105203     t2 = -0.0220389

Long trace was used for fitting.

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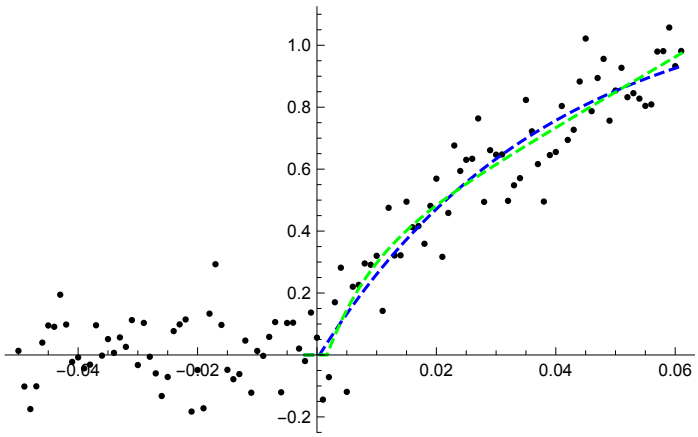


```
Mono: chi2 = 1.16271     d = 0.000423525     a = 1.16887     t = 0.0379306

Bi: ratio chi2Mono/chi2Bi = 1.03316     d = 0.0016923     a =
 41.3301     a1 = 0.297033     t1 =0.00731361     t2 = 3.56647

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---------- Ca = 1.27589

uM ----------

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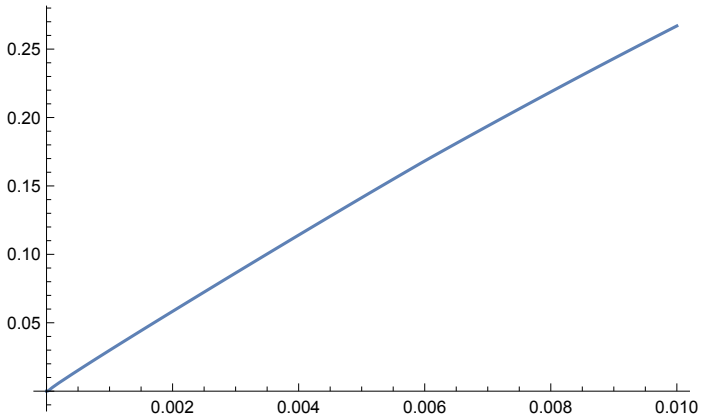


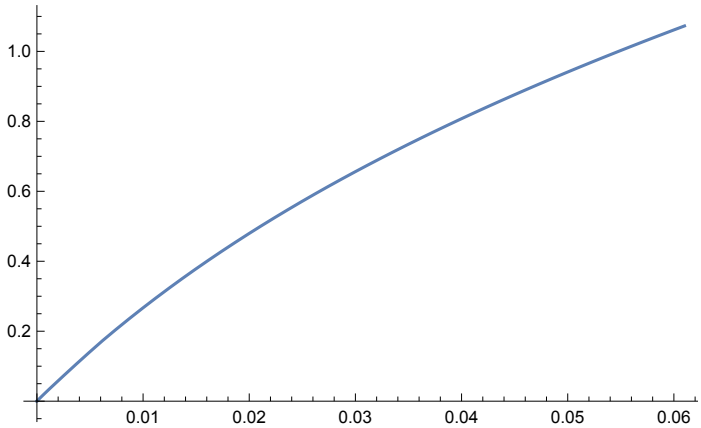


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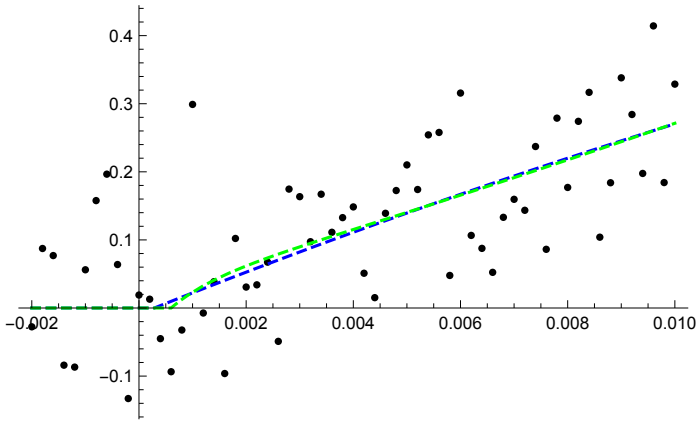


```
Mono: chi2 = 0.487875     d = 0.487875     a = 1.24898     t = 0.0398154
Bi: ratio chi2Mono/chi2Bi = 1.00718     d = 0.0006     a =
 -1.264     a1 = 0.0346729     t1 =0.000777574     t2 = -0.0561662
Long trace was used for fitting.
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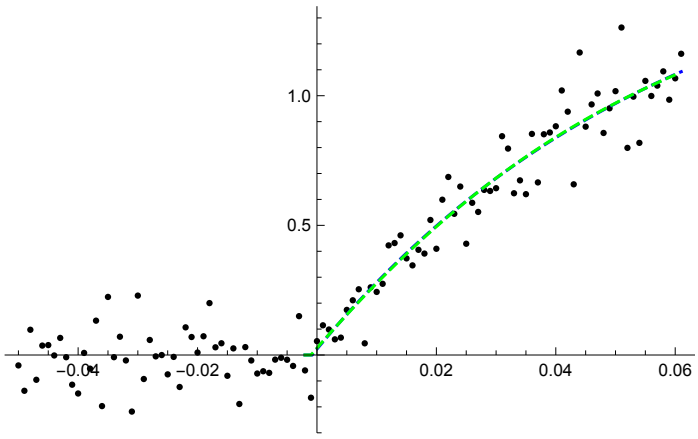


```
Mono: chi2 = 1.11547     d = -0.000818806     a = 1.7033     t = 0.0602789
Bi: ratio chi2Mono/chi2Bi = 1.00125     d = -0.001     a =
 1.5644     a1 = -0.264066     t1 =0.0218856     t2 = 0.0470575
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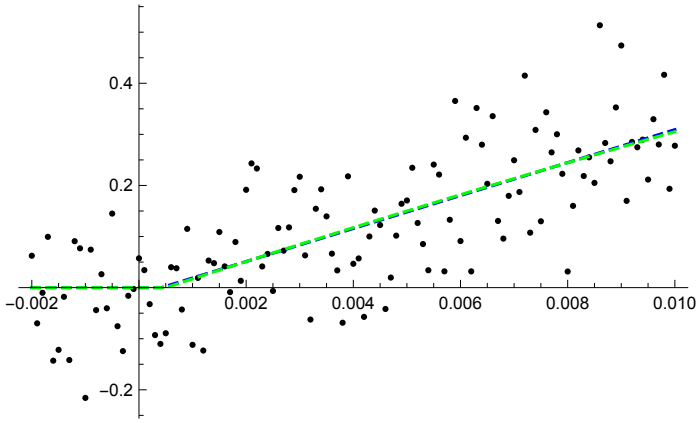


Mono: chi2 = 1.10123 d = 1.10123 a = $6.04983 \times 10^6$ t = 187 540.

Bi: ratio chi2Mono/chi2Bi = 0.998761 d = 0.0005 a = 1.56934 a1 = 2.19164 t1 =0.0652418 t2 = −0.726543

Long trace was used for fitting.

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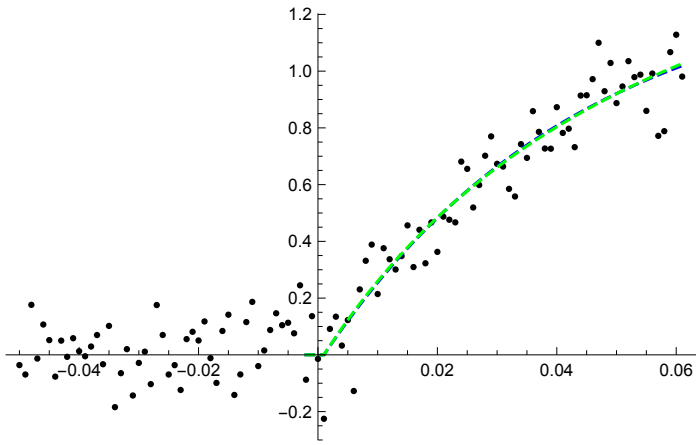


```
Mono: chi2 = 1.06794     d = 0.001     a = 1.35813     t = 0.043239
Bi: ratio chi2Mono/chi2Bi = 0.997794     d = 0.001     a =
 1.60927     a1 = 0.284875     t1 =0.0204745     t2 = 0.0708031
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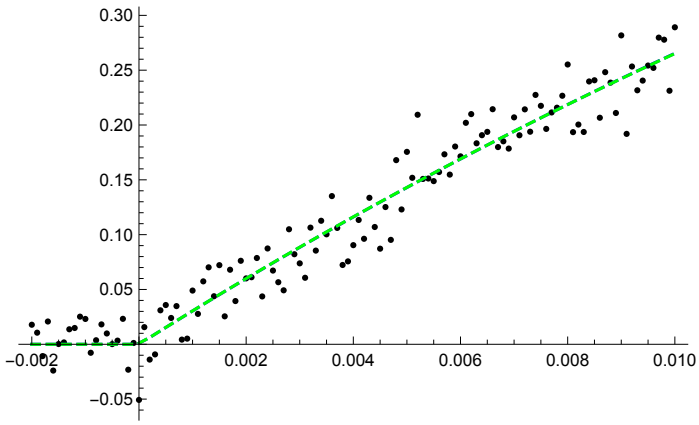


Mono: chi2 = 0.0519836 d = 0.0519836 a = 0.991062 t = 0.0320921

Bi: ratio chi2Mono/chi2Bi = 0.999922 d = $-4.42052 \times 10^{-17}$

a = 1.07838 a1 = 0.962078 t1 =0.0312747 t2 = 0.625174

Long trace was used for fitting.

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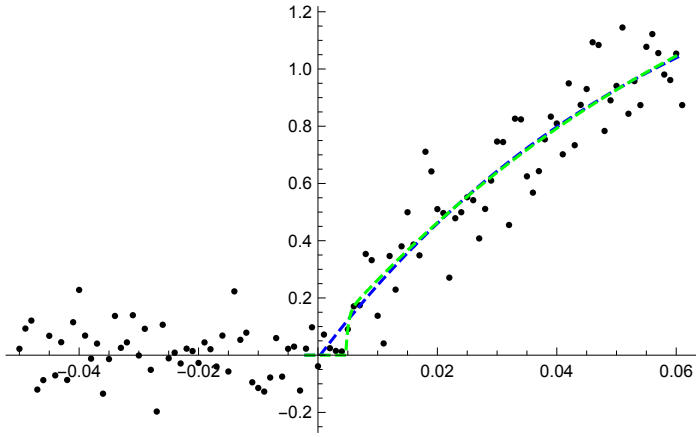


```
Mono: chi2 = 1.21109     d = 0.000364877     a = 1.64885     t = 0.0599608
Bi: ratio chi2Mono/chi2Bi = 1.01047     d = 0.00465463     a =
 1.88424     a1 = 0.144696     t1 =0.000408018     t2 = 0.0758611
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----------------     Ca = 1.33895
  uM          -------------------------------------------------------
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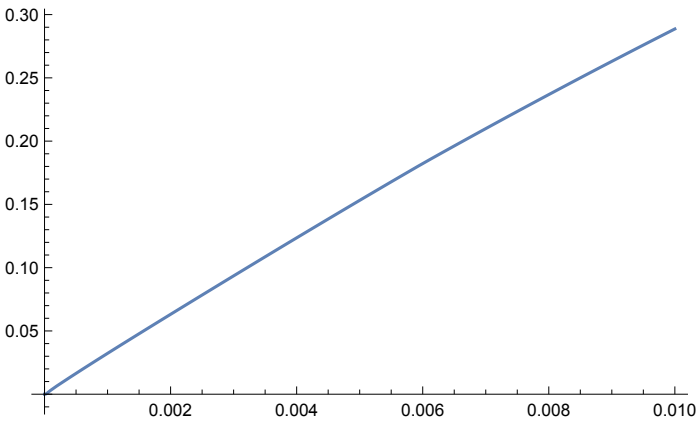

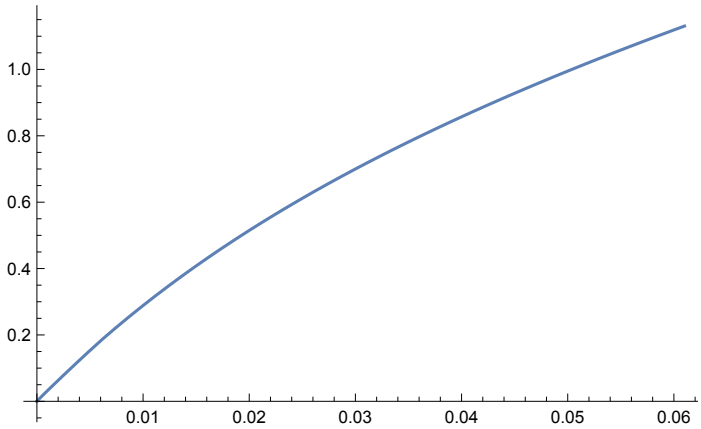


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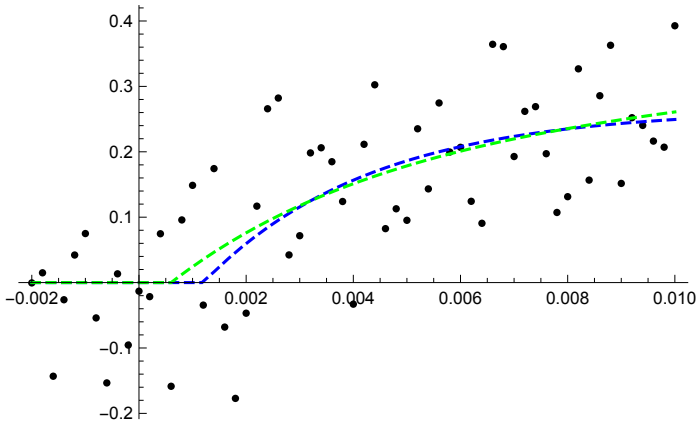


```
Mono: chi2 = 0.559972     d = 0.559972     a = 0.265551     t = 0.00314372
Bi: ratio chi2Mono/chi2Bi = 1.00647     d = 0.0006     a =
 1.32602     a1 = 0.225117     t1 =0.00392681     t2 = 0.178921
Long trace was used for fitting.
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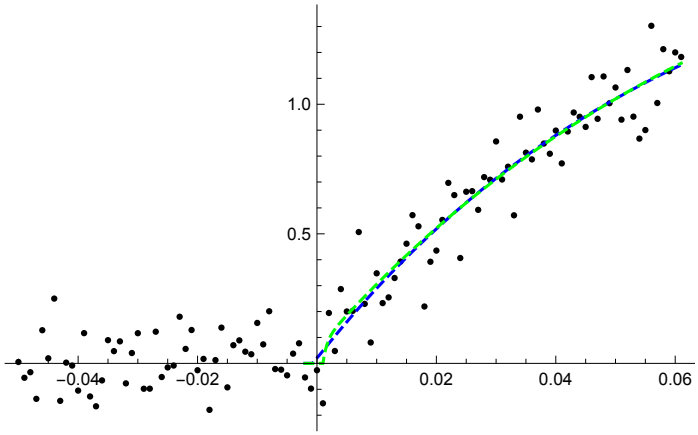


```
Mono: chi2 = 1.23668     d = -0.000668501     a = 1.82127     t = 0.0616179
Bi: ratio chi2Mono/chi2Bi = 1.02249     d = 0.001     a =
 2.02061     a1 = 0.0840325     t1 =0.000644981     t2 = 0.0741379
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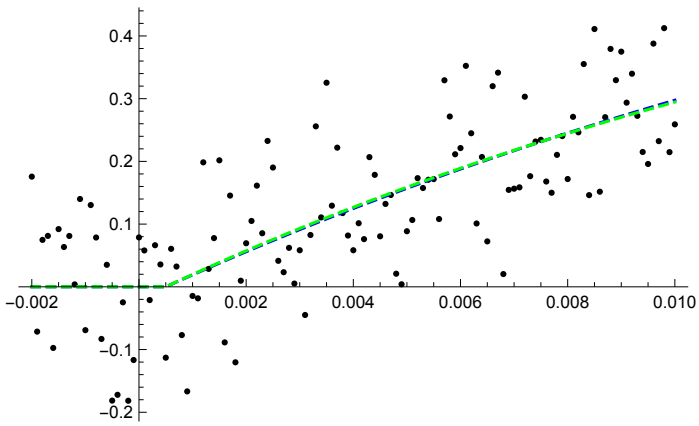

```
Mono: chi2 = 1.00421     d = 1.00421     a = 0.841813     t = 0.0217869
Bi: ratio chi2Mono/chi2Bi = 0.99973     d = 0.0005     a =
 1.13919     a1 = 0.748919     t1 =0.0184882     t2 = -0.585288
Long trace was used for fitting.
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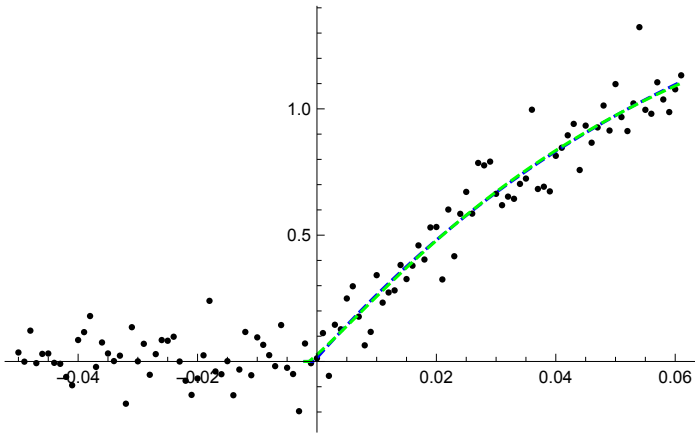


```
Mono: chi2 = 0.902312     d = -0.000527111     a = 1.901     t = 0.0704314
Bi: ratio chi2Mono/chi2Bi = 1.00153     d = -0.00133401     a =
 1.72615     a1 = -0.0661298     t1 =0.00625883     t2 = 0.0591337
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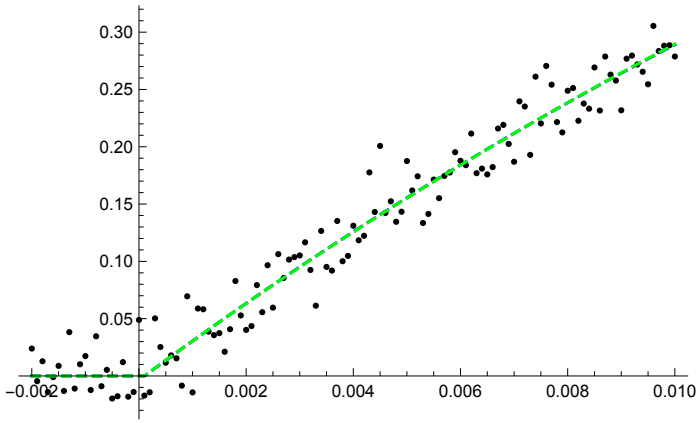


```
Mono: chi2 = 0.0499223     d = 0.0499223     a = 0.995895     t = 0.0288575
Bi: ratio chi2Mono/chi2Bi = 0.999934     d = 0.0001     a =
 1.62792     a1 = 0.976751     t1 =0.0291269     t2 = 0.793295
Long trace was used for fitting.
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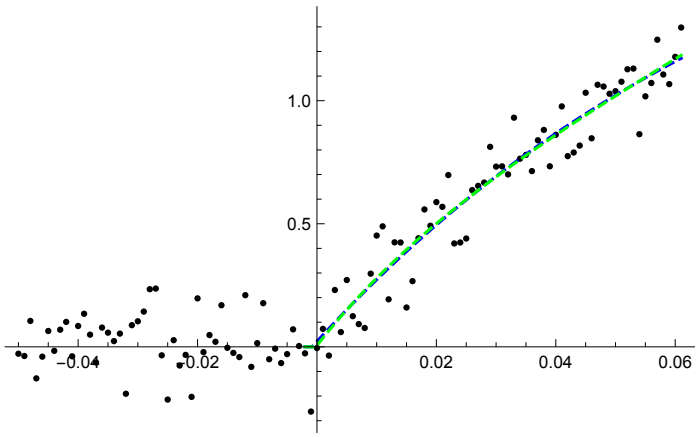


```
Mono: chi2 = 1.25968     d = -0.000818651     a = 2.23002     t = 0.082895
Bi: ratio chi2Mono/chi2Bi = 1.00212     d = -0.000177475
      a = 46.4095     a1 = 0.339945     t1 =0.0201656     t2 = 3.2435
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---------- Ca = 1.40597
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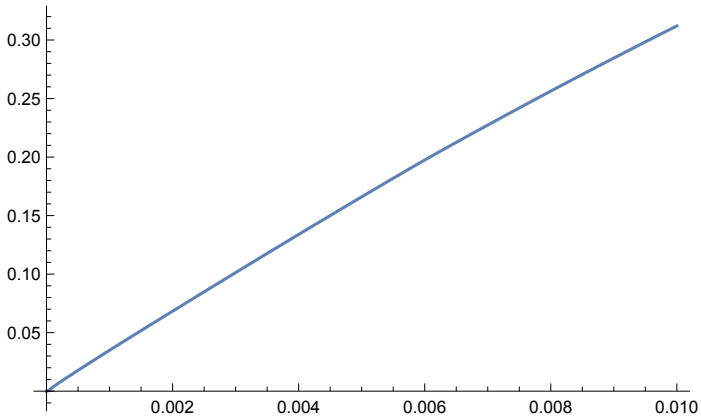


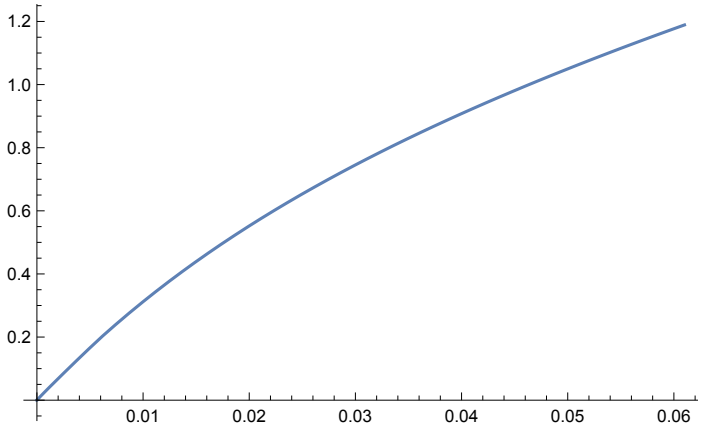


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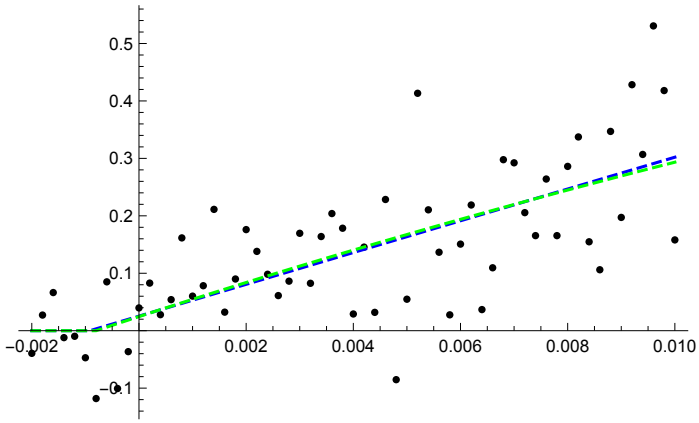


Mono: chi2 = 0.538359 d = 0.538359 a = $5.36727 \times 10^6$ t = 193 998.

Bi: ratio chi2Mono/chi2Bi = 0.993238 d = -0.0008 a = 1.59563 a1 = 1.27907 t1 =0.0405503 t2 = -0.601563

Long trace was used for fitting.

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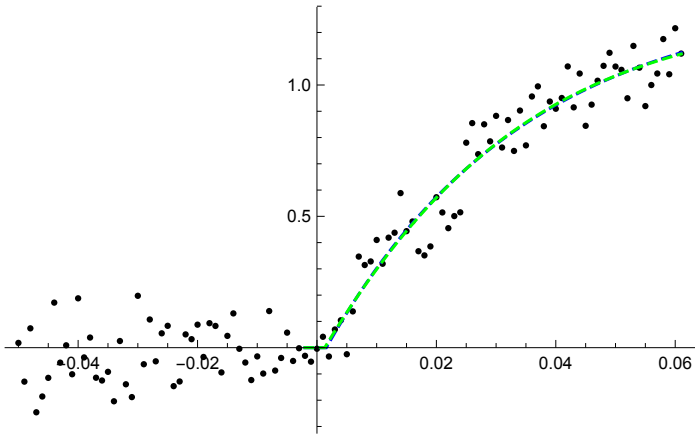


```
Mono: chi2 = 1.067     d = 0.0015558     a = 1.35045     t = 0.0333863
Bi: ratio chi2Mono/chi2Bi = 1.00071     d = 0.0013004     a =
 1.28436     a1 = -4.65478     t1 =0.0209599     t2 = 0.0228581
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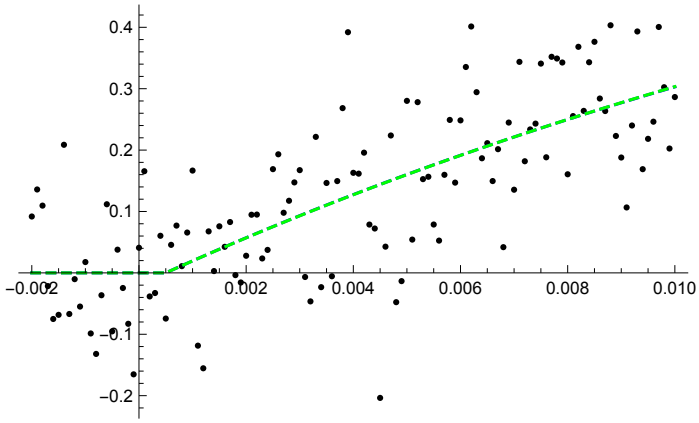


```
Mono: chi2 = 1.16066     d = 1.16066     a = 0.847512     t = 0.0214746
Bi: ratio chi2Mono/chi2Bi = 0.999999     d = 0.0005     a =
 1.23253     a1 = 0.823691     t1 =0.021383     t2 = 0.488398
Long trace was used for fitting.
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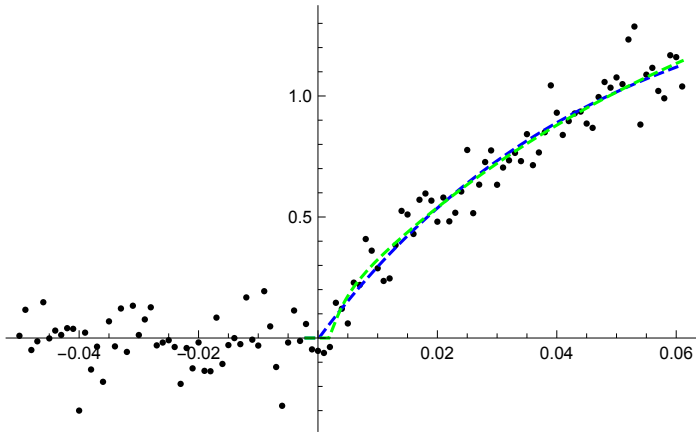


```
Mono: chi2 = 1.00059     d = 0.00016406     a = 1.54563     t = 0.0464766

Bi: ratio chi2Mono/chi2Bi = 1.02274     d = 0.002     a =
 1.89378     a1 = 0.136243     t1 =0.00232438     t2 = 0.0691275

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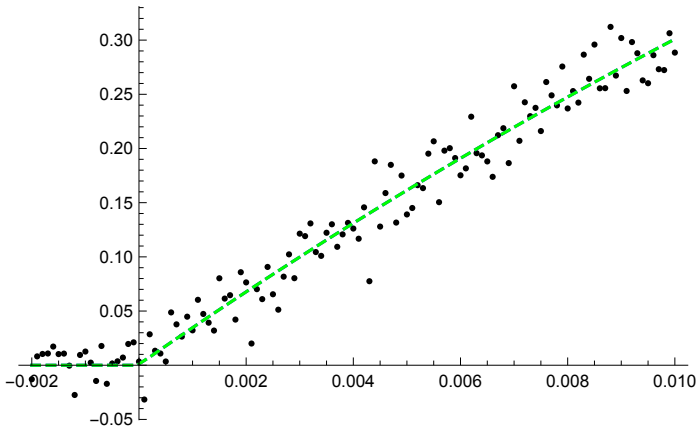


```
Mono: chi2 = 0.0452043     d = 0.0452043     a = 1.21676     t = 0.0352614
Bi: ratio chi2Mono/chi2Bi = 1.00007     d = -0.0000186784
      a = 0.905932     a1 = 1.58901     t1 =0.0394158     t2 = 0.117666
Long trace was used for fitting.
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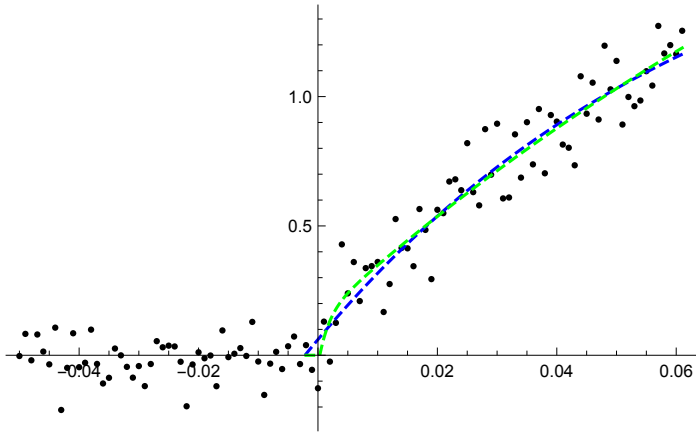


```
Mono: chi2 = 1.02585     d = -0.00217442     a = 1.89952     t = 0.0666196
Bi: ratio chi2Mono/chi2Bi = 1.04379     d = 0.000307541     a =
 3.18813     a1 = 0.152597     t1 =0.00165913     t2 = 0.145469
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----------------     Ca = 1.47745
  uM          -------------------------------------------------------
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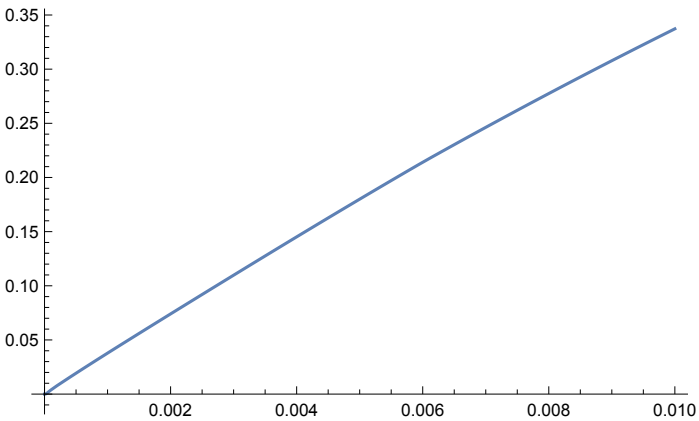

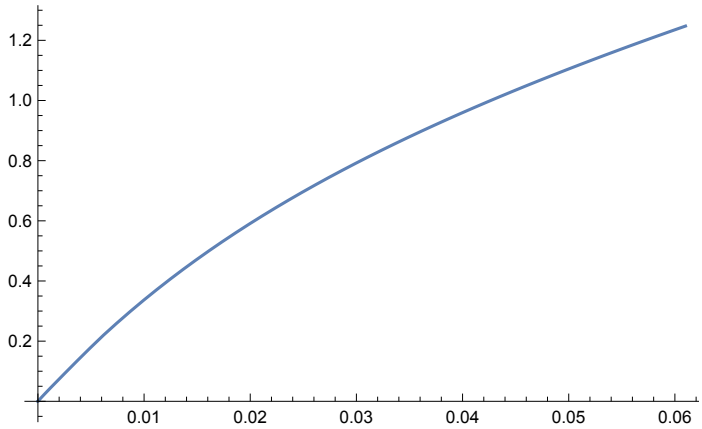


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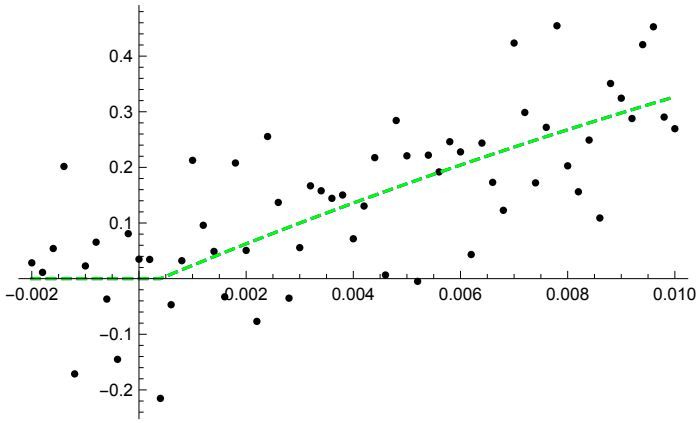


```
Mono: chi2 = 0.610555     d = 0.610555     a = 1.12596     t = 0.0279931
Bi: ratio chi2Mono/chi2Bi = 0.999982     d = 0.0004     a =
 1.56124     a1 = 1.16348     t1 =0.0283074     t2 = -0.484444
Long trace was used for fitting.
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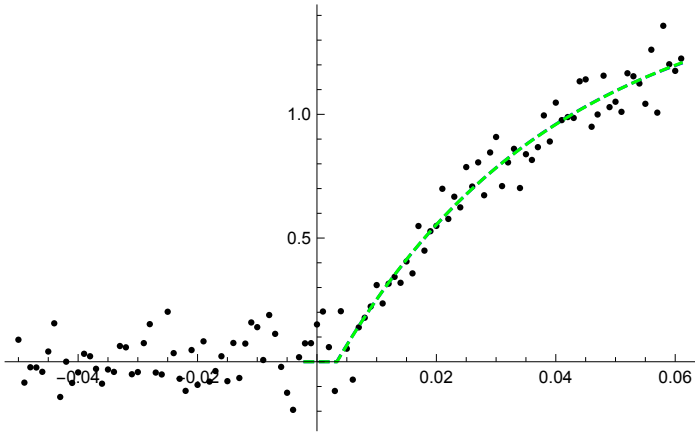


```
Mono: chi2 = 0.835853     d = 0.00331756     a = 1.52985     t = 0.0371399
Bi: ratio chi2Mono/chi2Bi = 1.00004     d = 0.00335859
      a = 3.56994     a1 = 1.38718     t1 =0.0345564     t2 = 1.50258
------------------------------------------------------------------------- C10
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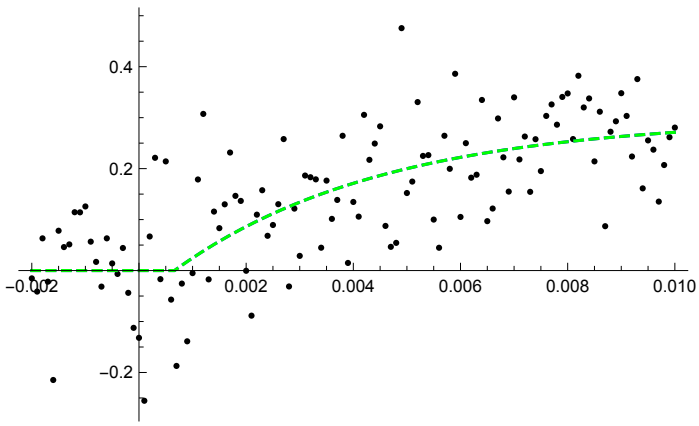

```
Mono: chi2 = 1.16955     d = 1.16955     a = 0.298898     t = 0.00392465
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000662842     a =
 0.322134     a1 = 0.298204     t1 =0.00391647     t2 = 0.450343
Long trace was used for fitting.
take bi
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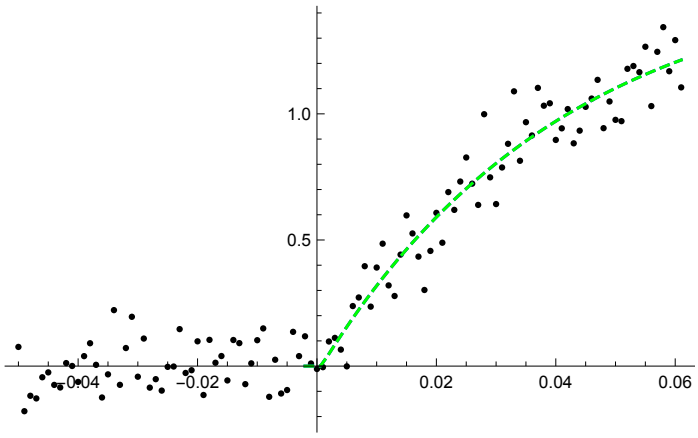


```
Mono: chi2 = 1.05644     d = 0.000721249     a = 1.57757     t = 0.041114
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000721249     a =
 1.57757     a1 = 0.0618478     t1 =0.0411141     t2 = 0.041114
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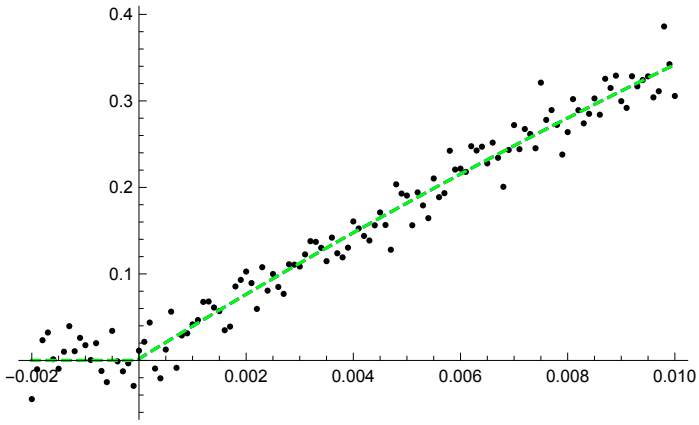


```
Mono: chi2 = 0.0483794     d = 0.0483794     a = 1.62198     t = 0.042441

Bi: ratio chi2Mono/chi2Bi = 1.     d = -0.0000486816     a =
 1.62198     a1 = 0.627852     t1 =0.042441     t2 = 0.042441

Long trace was used for fitting.

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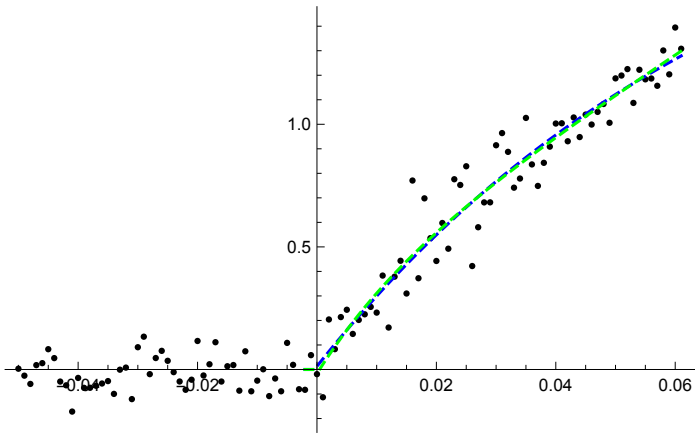


```
Mono: chi2 = 0.898551     d = -0.000417426     a = 2.24062     t = 0.0726209
Bi: ratio chi2Mono/chi2Bi = 1.00897     d = 0.000432122
      a = 70.9348     a1 = 0.335419     t1 =0.0151568     t2 = 4.38072
-------------------------------------------------------------------------------------
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---------- Ca = 1.55324

uM ----------

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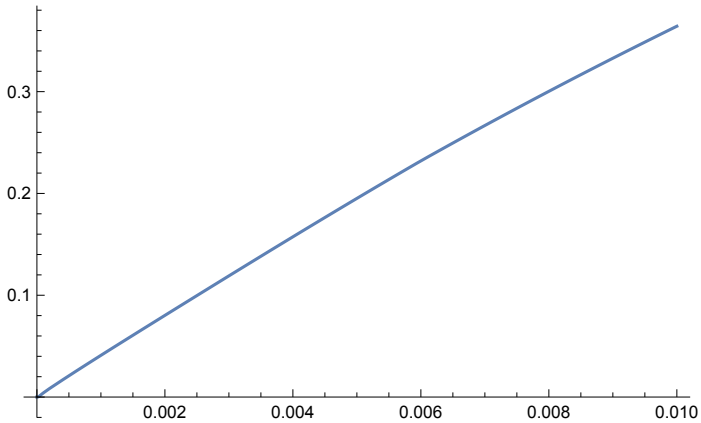


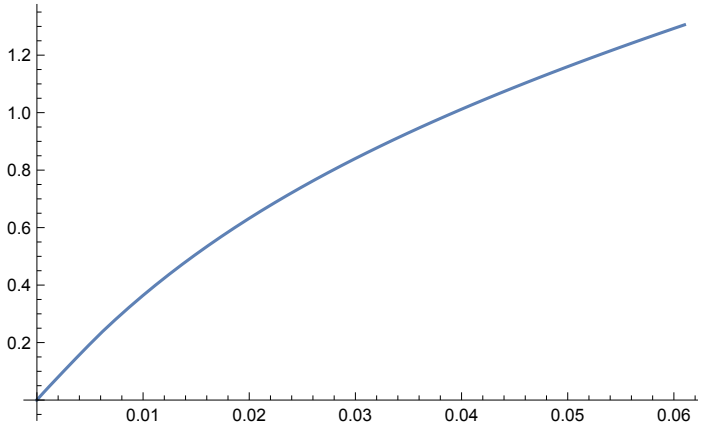


---------- C5

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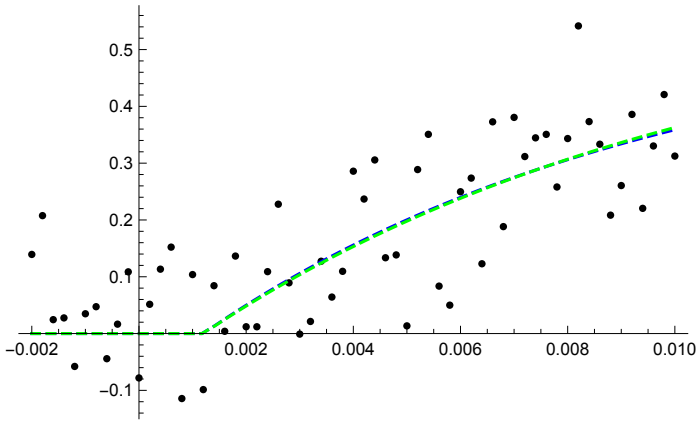


```
Mono: chi2 = 0.546979     d = 0.546979     a = 0.559526     t = 0.00858083
Bi: ratio chi2Mono/chi2Bi = 0.999954     d = 0.0012     a =
 0.908248     a1 = 0.584184     t1 =0.00935557     t2 = 0.424381
Long trace was used for fitting.
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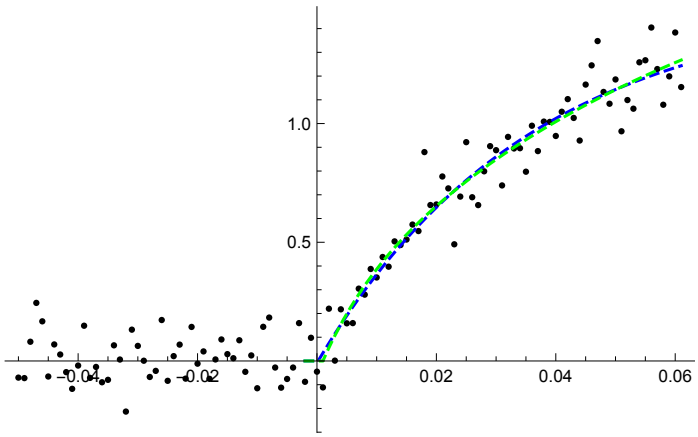


```
Mono: chi2 = 1.09024     d = 0.000200062     a = 1.52138     t = 0.0357671
Bi: ratio chi2Mono/chi2Bi = 1.01423     d = 0.001     a =
 1.94977     a1 = 0.24387     t1 =0.00774961     t2 = 0.0654728
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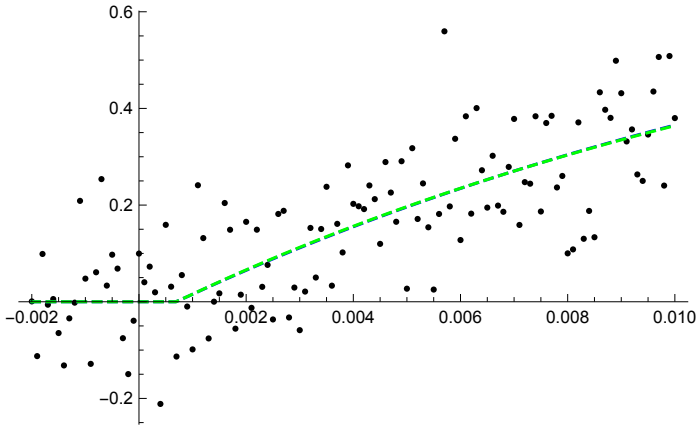


```
Mono: chi2 = 1.32758     d = 1.32758     a = 0.812436     t = 0.0155645
Bi: ratio chi2Mono/chi2Bi = 1.00008     d = 0.0007     a =
 1.58469     a1 = 0.442192     t1 =0.0108552     t2 = 0.0919492
Long trace was used for fitting.
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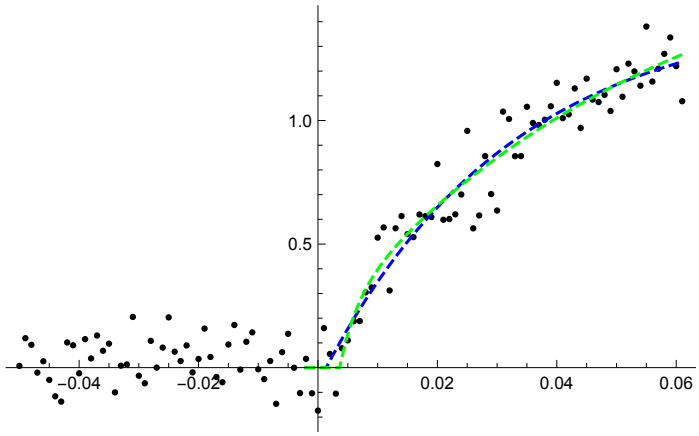


```
Mono: chi2 = 1.09315     d = 0.00138374     a = 1.46017     t = 0.031704

Bi: ratio chi2Mono/chi2Bi = 1.05282     d = 0.00364003     a =
 1.82912     a1 = 0.257911     t1 =0.0029441     t2 = 0.055798

------------------------------------------------------------------------- D

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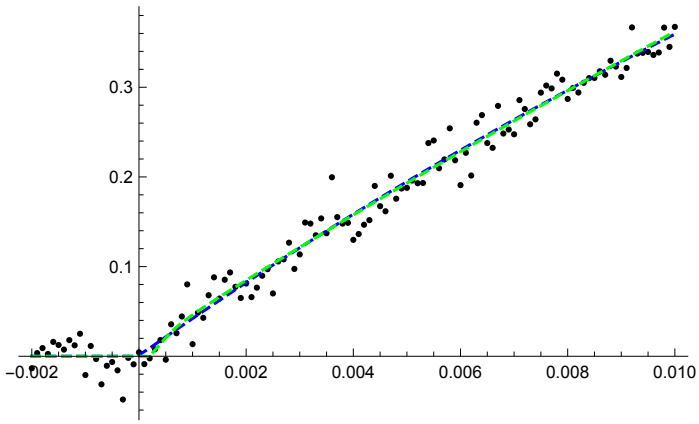


```
Mono: chi2 = 0.0352887     d = 0.0352887     a = 1.27616     t = 0.0303016
Bi: ratio chi2Mono/chi2Bi = 1.01375     d = 0.000263385     a =
 2.27657     a1 = 0.0194929     t1 =0.00025844     t2 = 0.0591351
Long trace was used for fitting.
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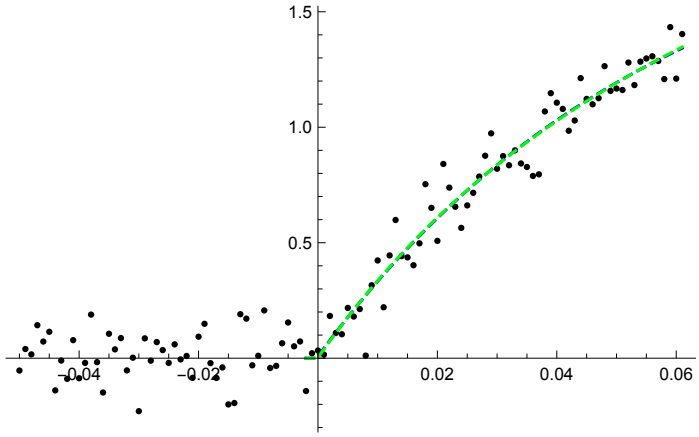


```
Mono: chi2 = 1.05224      d = -0.000220809      a = 2.05487      t = 0.0578041
Bi: ratio chi2Mono/chi2Bi = 1.00033      d = -0.0000653309
      a = 7.7106      a1 = 1.11104      t1 =0.0383168      t2 = 0.841019
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 1.63202
  uM          -------------------------------------------------------
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  -------------------------
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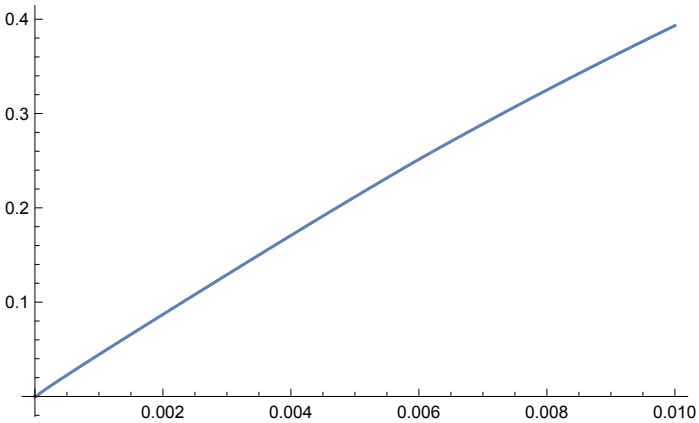

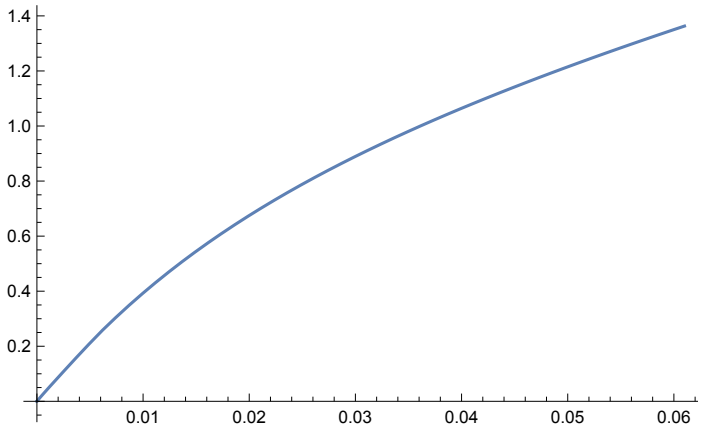


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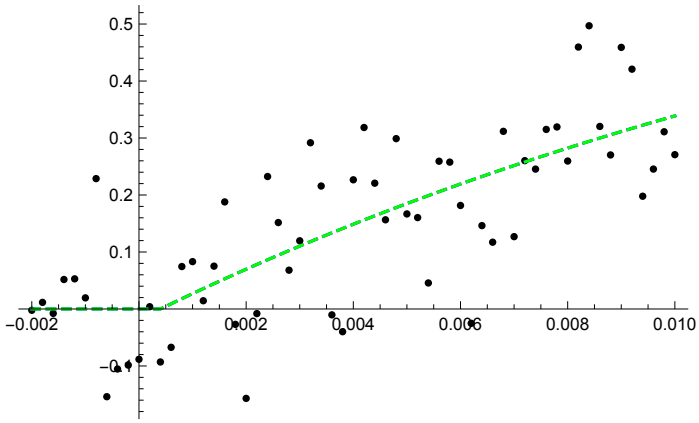


```
Mono: chi2 = 0.659215     d = 0.659215     a = 0.814402     t = 0.0178546
Bi: ratio chi2Mono/chi2Bi = 0.999991     d = 0.0004     a =
 1.37801     a1 = 0.873203     t1 =0.018569     t2 = -0.354158
Long trace was used for fitting.
take mono
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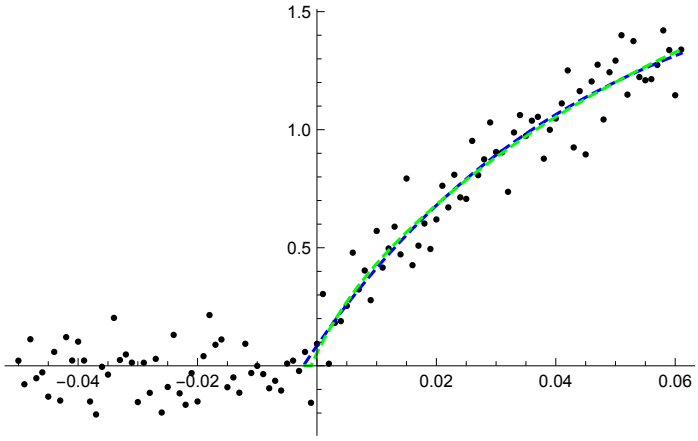


```
Mono: chi2 = 1.22396     d = -0.00226985     a = 1.77247     t = 0.0460912
Bi: ratio chi2Mono/chi2Bi = 1.01061     d = -0.001     a =
 2.12784     a1 = 0.16542     t1 =0.0058976     t2 = 0.0679577
------------------------------------------------------------------------- C10
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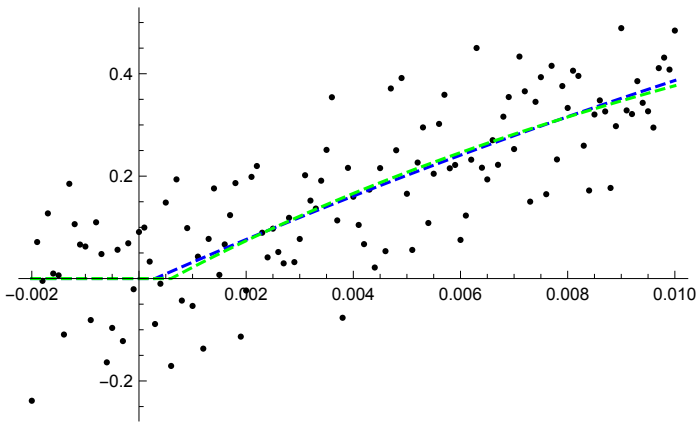

```
Mono: chi2 = 1.15552     d = 1.15552     a = 1.51536     t = 0.0329129
Bi: ratio chi2Mono/chi2Bi = 0.99764     d = 0.0006     a =
 1.51148     a1 = 0.332288     t1 =0.00884354     t2 = 0.0648732
Long trace was used for fitting.
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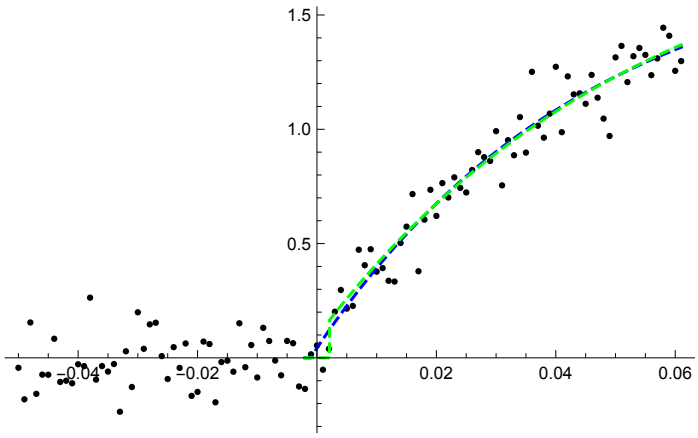


Mono: chi2 = 1.17578 d = -0.00109068 a = 1.83389 t = 0.0459536

Bi: ratio chi2Mono/chi2Bi = 1.02206 d = 0.00209875 a = 1.99201 a1 = 0.164595 t1 = $2.63223 \times 10^{-6}$ t2 = 0.0547154

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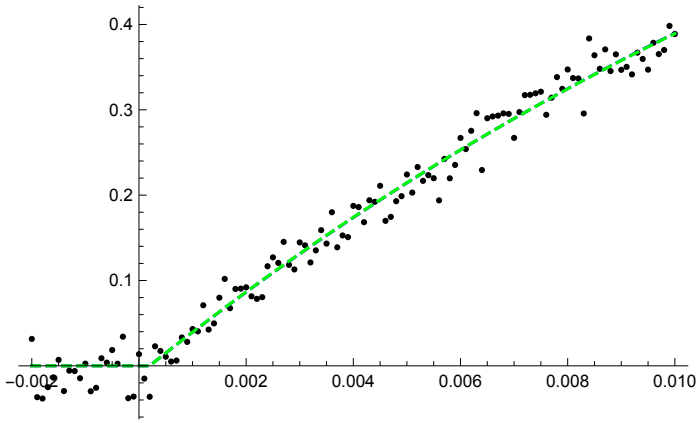


```
Mono: chi2 = 0.041724     d = 0.041724     a = 1.01507     t = 0.0202326
Bi: ratio chi2Mono/chi2Bi = 0.999475     d = 0.0002     a =
 1.0747     a1 = 0.455271     t1 =0.0157104     t2 = 0.028924
Long trace was used for fitting.
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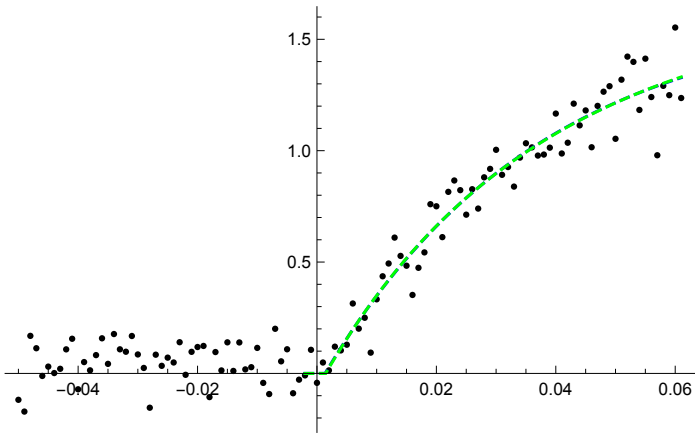


```
Mono: chi2 = 1.13338     d = 0.00137214     a = 1.64629     t = 0.0362917
Bi: ratio chi2Mono/chi2Bi = 1.00009     d = 0.00145814     a =
 1.77764     a1 = 0.924758     t1 =0.0280273     t2 = 0.0639835
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---------- Ca = 1.71772
uM ----------
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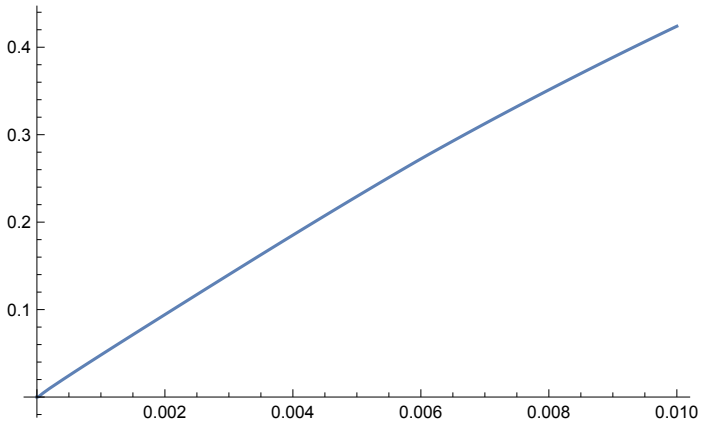


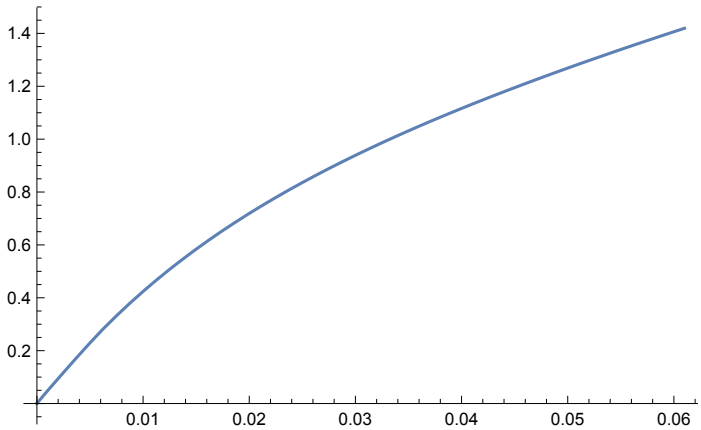


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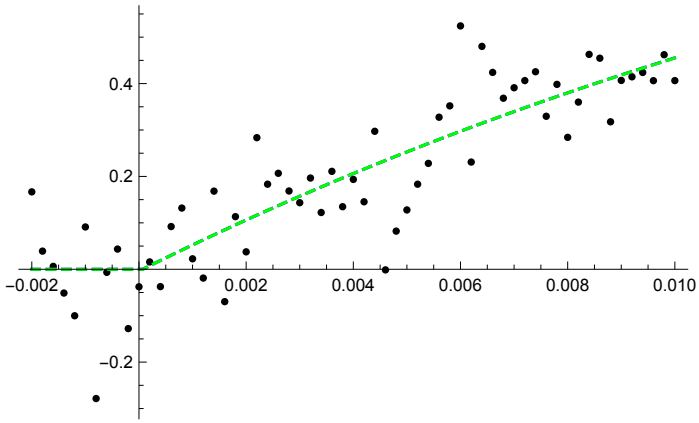


```
Mono: chi2 = 0.51395     d = 0.51395     a = 1.21135     t = 0.0210638

Bi: ratio chi2Mono/chi2Bi = 1.0001     d = 0.0000723595     a =
 0.805475     a1 = 1.86904     t1 =0.0250423     t2 = 0.0622771

Long trace was used for fitting.

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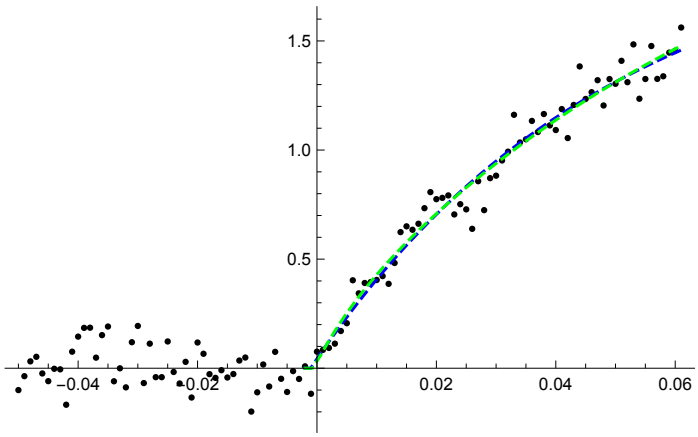


```
Mono: chi2 = 0.809193     d = -0.0010555     a = 2.04903     t = 0.0499222
Bi: ratio chi2Mono/chi2Bi = 1.0121     d = -0.000521126     a =
 2.5562     a1 = 0.148619     t1 =0.00647366     t2 = 0.0766155
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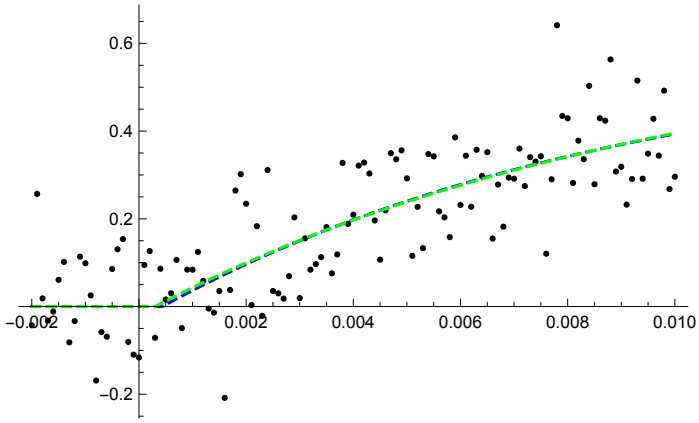


```
Mono: chi2 = 1.22376     d = 1.22376     a = 0.594543     t = 0.00882443
Bi: ratio chi2Mono/chi2Bi = 1.00025     d = 0.0003     a =
 1.07172     a1 = 0.604935     t1 =0.00966288     t2 = 0.3719
Long trace was used for fitting.
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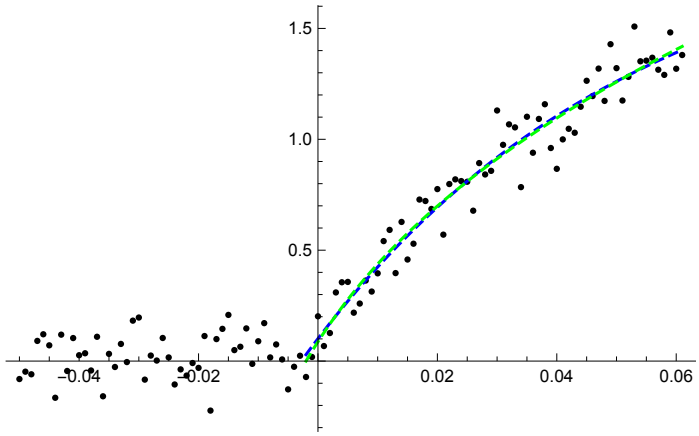


```
Mono: chi2 = 1.0802     d = -0.00278475     a = 2.04008     t = 0.0548231

Bi: ratio chi2Mono/chi2Bi = 1.00708     d = -0.002     a =
 2.8941     a1 = 0.250663     t1 =0.0118954     t2 = 0.107866

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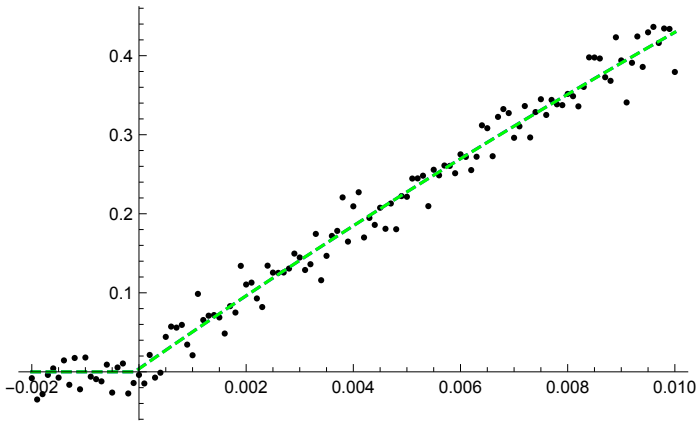


```
Mono: chi2 = 0.0469234     d = 0.0469234     a = 2.30796     t = 0.0489761
Bi: ratio chi2Mono/chi2Bi = 1.00006     d = -0.000079117     a =
 3.23065     a1 = 0.0429573     t1 =0.00838101     t2 = 0.0752451
Long trace was used for fitting.
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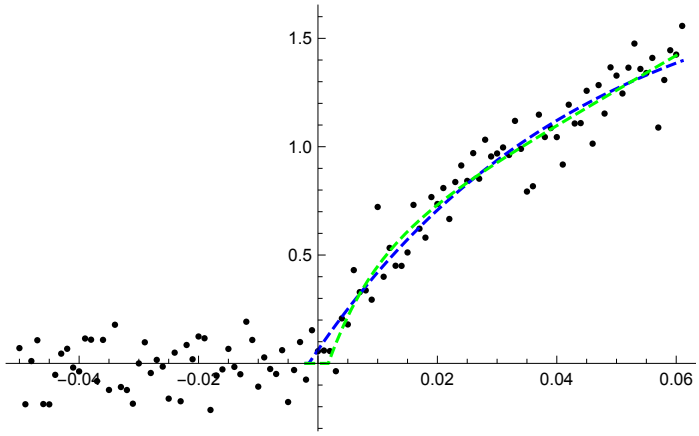


```
Mono: chi2 = 1.30381     d = -0.0015254     a = 1.85875     t = 0.0449376
Bi: ratio chi2Mono/chi2Bi = 1.03931     d = 0.00174036     a =
 52.0993     a1 = 0.48146     t1 =0.00782422     t2 = 3.17031
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  -------------------------
----------------     Ca = 1.81058
  uM          -------------------------------------------------------
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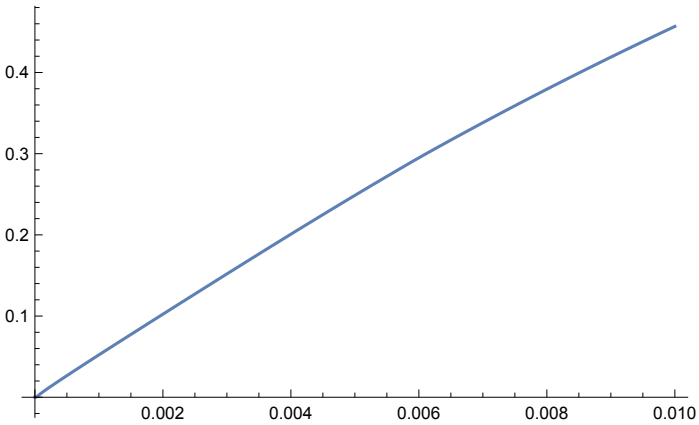

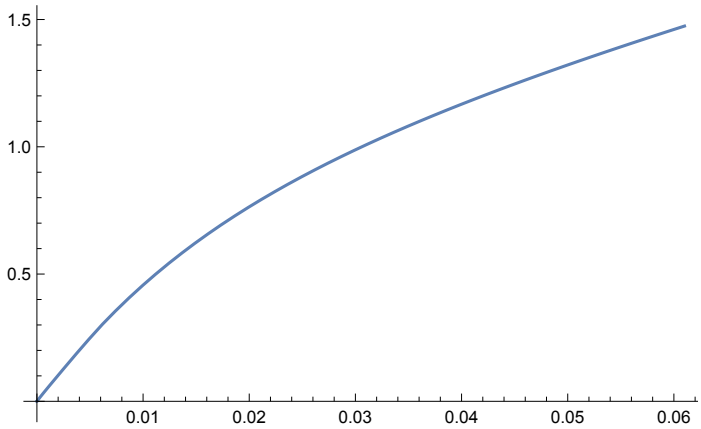


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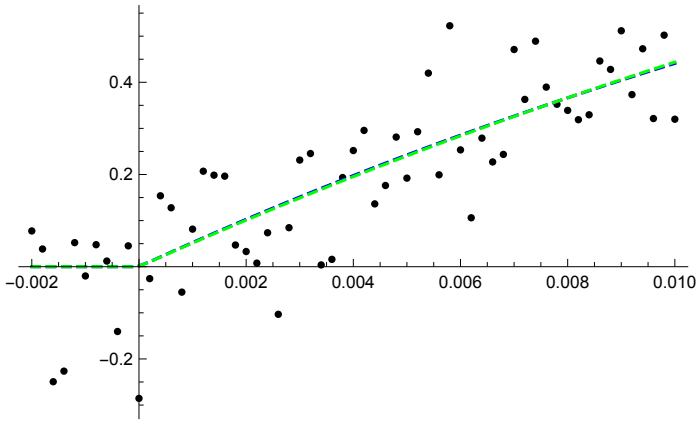


Mono: chi2 = 0.732504 d = 0.732504 a = 1.33555 t = 0.0249587

Bi: ratio chi2Mono/chi2Bi = 1.00064 d = $6.17982 \times 10^{-17}$

a = 1.54876 a1 = 1.56601 t1 =0.0299875 t2 = 0.480072

Long trace was used for fitting.

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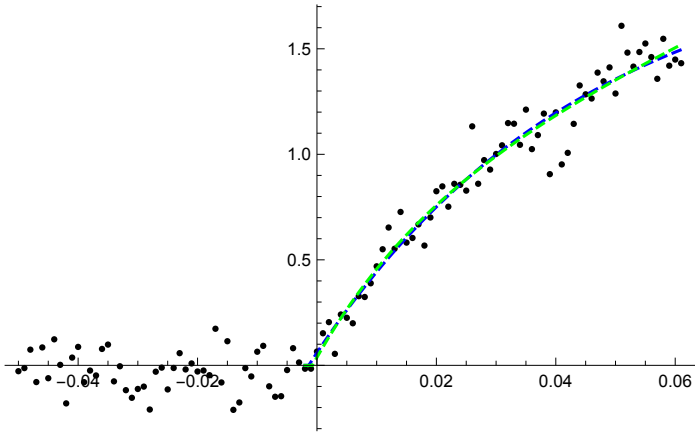


```
Mono: chi2 = 0.997972     d = -0.00137345     a = 2.00688     t = 0.0456164
Bi: ratio chi2Mono/chi2Bi = 1.00838     d = -0.00074082
      a = 16.8334     a1 = 0.699727     t1 =0.0186739     t2 = 1.14665
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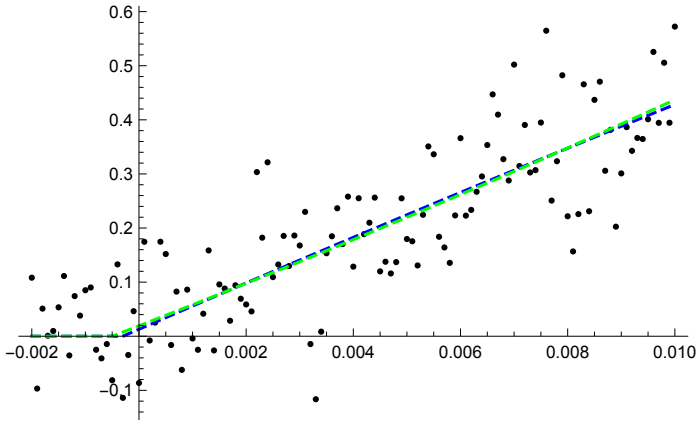

```
Mono: chi2 = 0.963375     d = 0.963375     a = 5.92662     t = 0.137335
Bi: ratio chi2Mono/chi2Bi = 1.00088     d = -0.0005     a =
 -3.15598     a1 = -0.840659     t1 =-0.0441993     t2 = -0.120088
Long trace was used for fitting.
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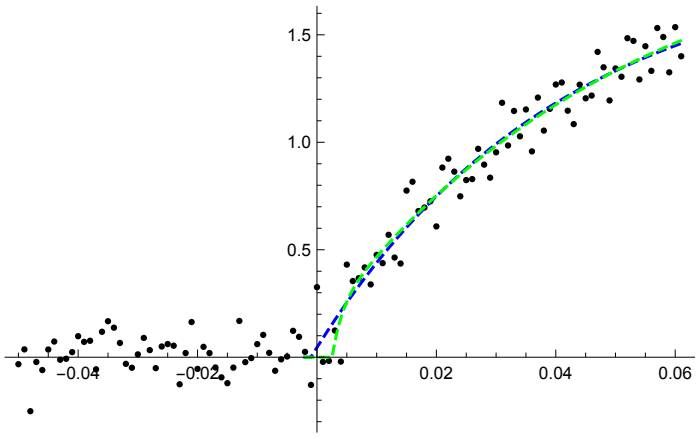


```
Mono: chi2 = 1.00512      d = -0.001      a = 1.87766      t = 0.0412517
Bi: ratio chi2Mono/chi2Bi = 1.0267      d = 0.00254419      a =
 2.06773      a1 = 0.220655      t1 =0.00162263      t2 = 0.0515413
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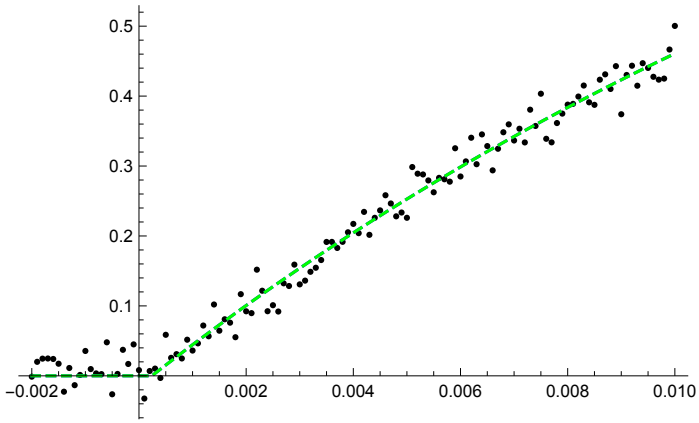


```
Mono: chi2 = 0.0503609     d = 0.0503609     a = 1.19136     t = 0.0199575
Bi: ratio chi2Mono/chi2Bi = 1.00003     d = 0.00024049     a =
 0.903193     a1 = 1.20623     t1 =0.0200952     t2 = 0.891863
Long trace was used for fitting.
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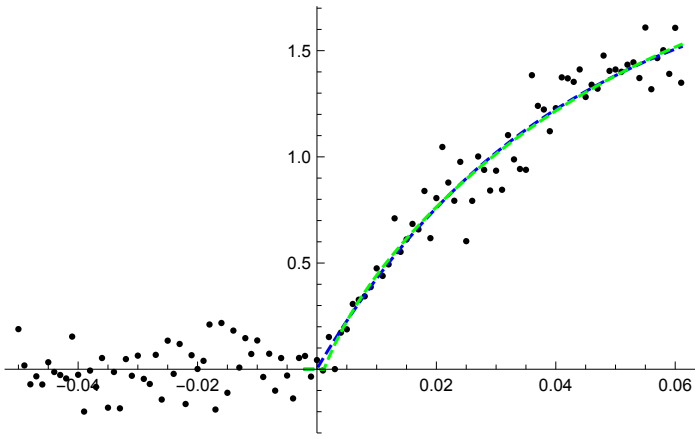


```
Mono: chi2 = 1.23997     d = -0.0000409307     a = 1.95501     t = 0.0407236
Bi: ratio chi2Mono/chi2Bi = 1.00696     d = 0.0011718     a =
 2.11355     a1 = 0.135695     t1 =0.00443717     t2 = 0.0490842
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---------- Ca = 1.90732
uM ----------
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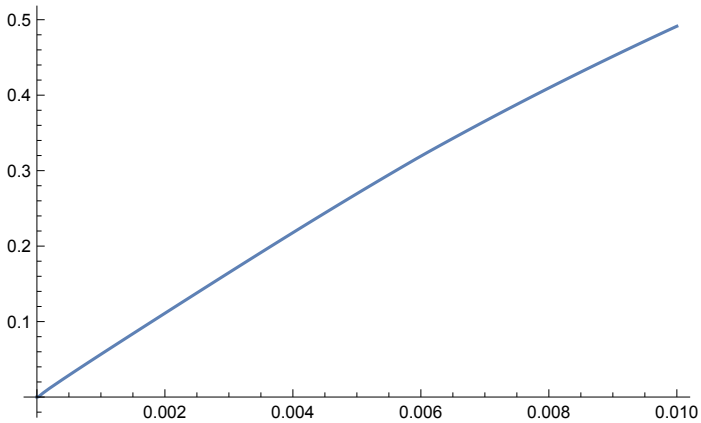


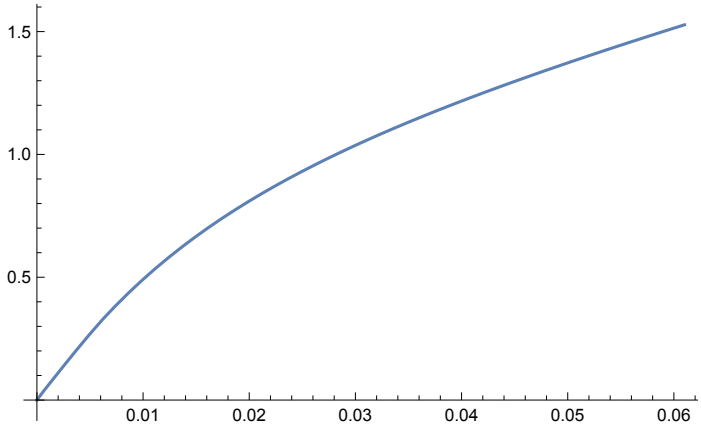


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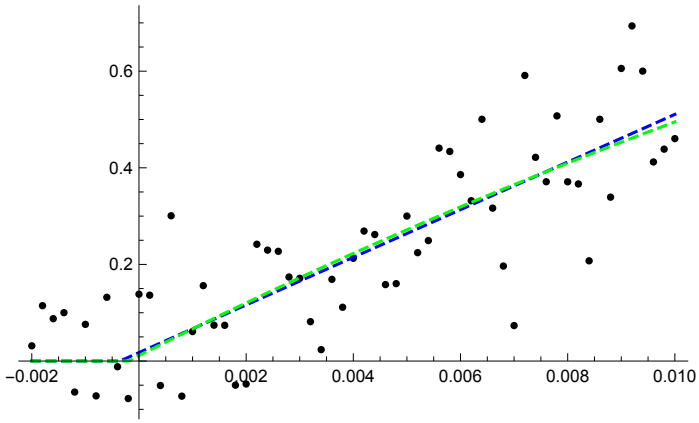


Mono: chi2 = 0.752515 d = 0.752515 a = $7.12947 \times 10^6$ t = 144 629.

Bi: ratio chi2Mono/chi2Bi = 0.990083 d = −0.0002 a = 2.27721 a1 = 1.35353 t1 =0.0283228 t2 = 0.104785

Long trace was used for fitting.

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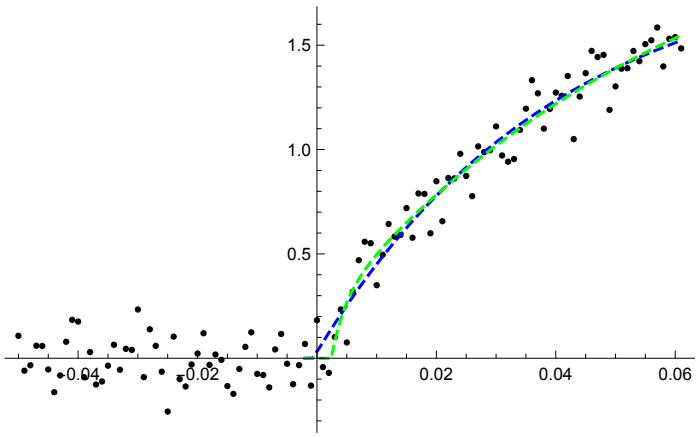


```
Mono: chi2 = 1.1574     d = -0.000625278     a = 1.94237     t = 0.0402463
Bi: ratio chi2Mono/chi2Bi = 1.06194     d = 0.00238983     a =
 2.35643     a1 = 0.264684     t1 =0.00232219     t2 = 0.0617108
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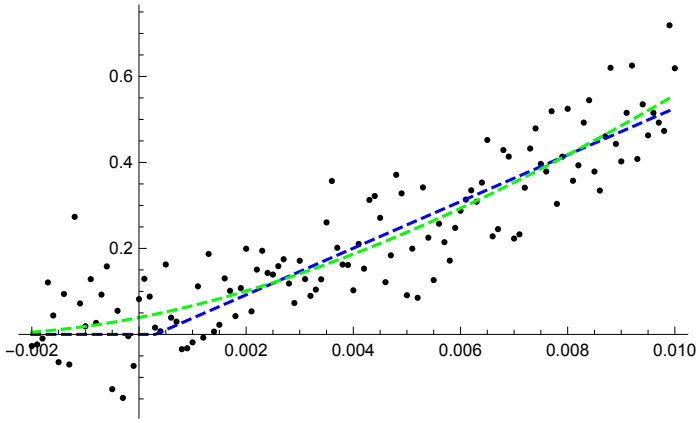


Mono: chi2 = 0.877876 d = 0.877876 a = $1.46106 \times 10^{7}$ t = 269 319.

Bi: ratio chi2Mono/chi2Bi = 1.05927 d = -0.00306288 a = 8.41095 a1 = -9.37589 t1 =0.0226937 t2 = 0.0429973

Long trace was used for fitting.

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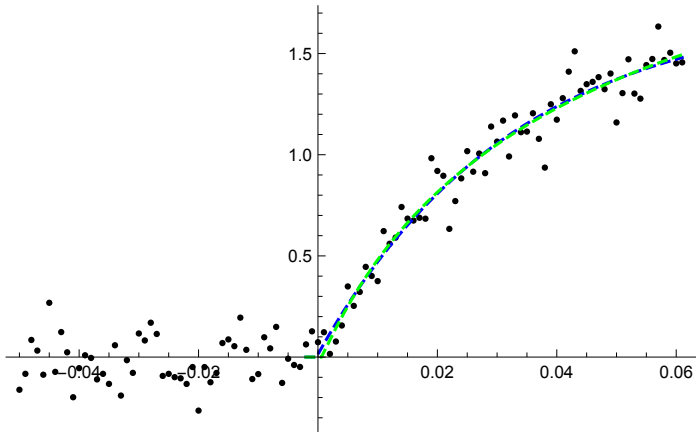


```
Mono: chi2 = 1.19715     d = -0.00025498     a = 1.74807     t = 0.032662

Bi: ratio chi2Mono/chi2Bi = 1.00423     d = 0.000660972     a =
 1.98625     a1 = 0.340795     t1 =0.0105924     t2 = 0.0498887

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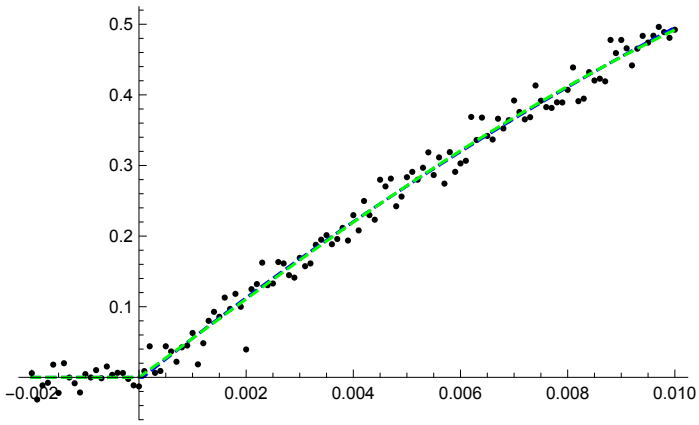


Mono: chi2 = 0.0366879 d = 0.0366879 a = 1.48669 t = 0.0245017

Bi: ratio chi2Mono/chi2Bi = 1.00493 d = $1.16534 \times 10^{-15}$ a = 0.922413 a1 = -0.322666 t1 =0.00484477 t2 = 0.0102911

Long trace was used for fitting.

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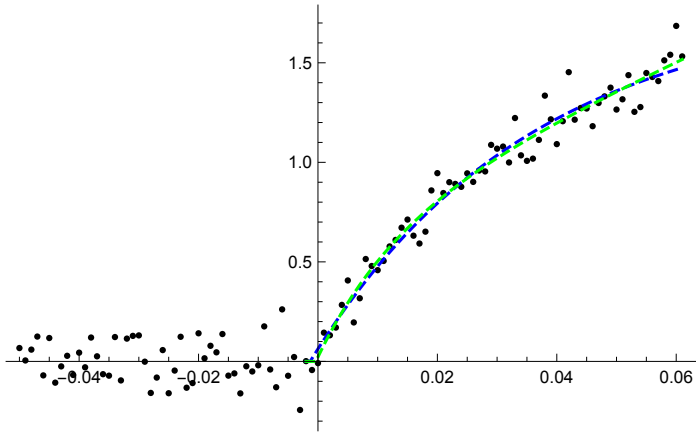


```
Mono: chi2 = 0.954382     d = -0.00129773     a = 1.80729     t = 0.0367951
Bi: ratio chi2Mono/chi2Bi = 1.03234     d = -0.000346699
      a = 41.5483     a1 = 0.654458     t1 =0.0131729     t2 = 2.85848
-------------------------------------------------------------------------------------
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----------------     Ca = 2.01009
  uM          -------------------------------------------------------
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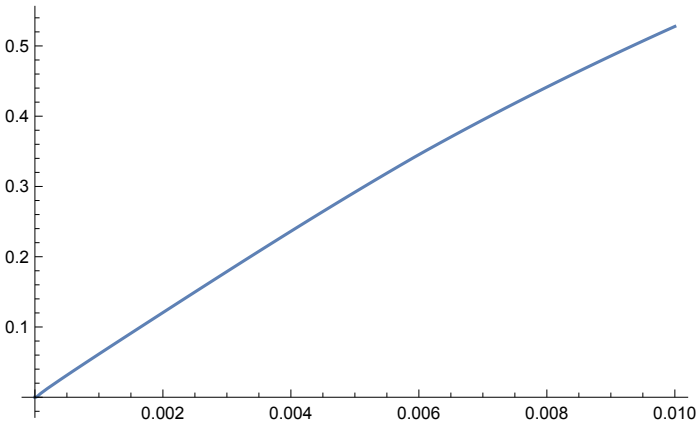

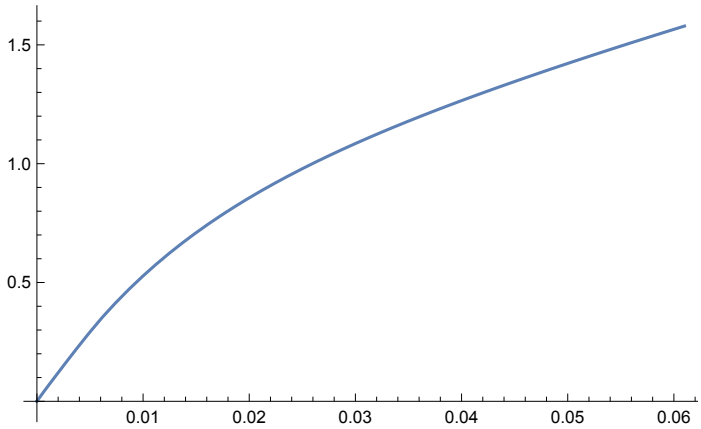


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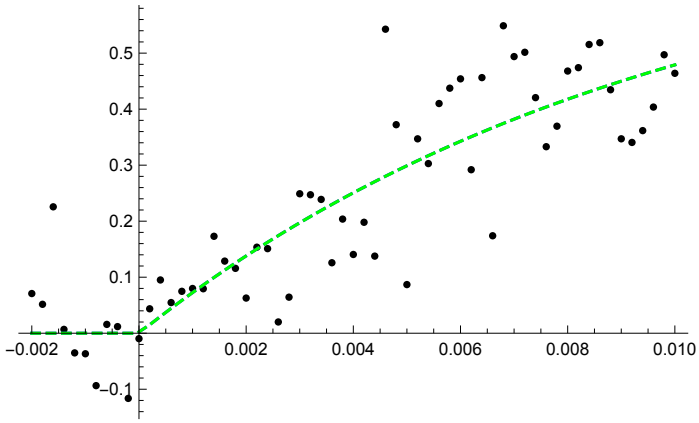


Mono: chi2 = 0.513219 d = 0.513219 a = 0.751031 t = 0.00984808

Bi: ratio chi2Mono/chi2Bi = 0.999993 d = $-7.09719 \times 10^{-15}$ a = 0.766263 a1 = 0.750685 t1 =0.00985271 t2 = 0.361973

Long trace was used for fitting.

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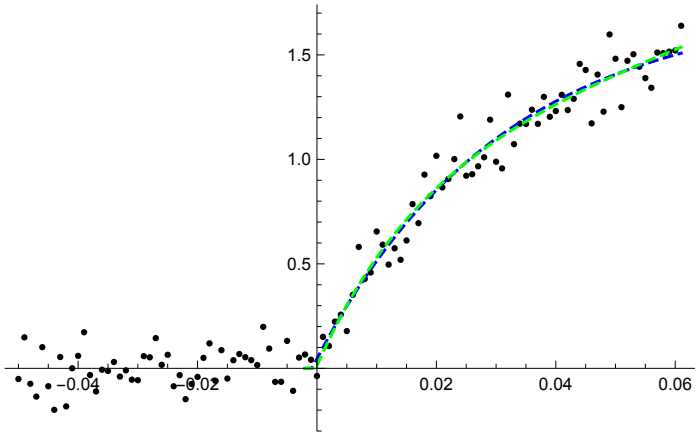


```
Mono: chi2 = 0.969997     d = -0.000817519     a = 1.74668     t = 0.0310483
Bi: ratio chi2Mono/chi2Bi = 1.01195     d = -0.000177686
      a = 13.4552     a1 = 0.92592     t1 =0.0167637     t2 = 1.17551
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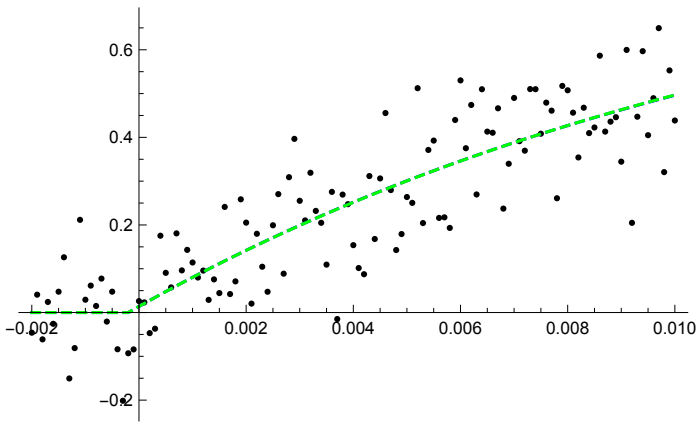

```
Mono: chi2 = 1.16326     d = 1.16326     a = 0.913124     t = 0.0130119
Bi: ratio chi2Mono/chi2Bi = 0.999995     d = -0.0002     a =
 1.30614     a1 = 0.873714     t1 =0.0127596     t2 = 0.273298
Long trace was used for fitting.
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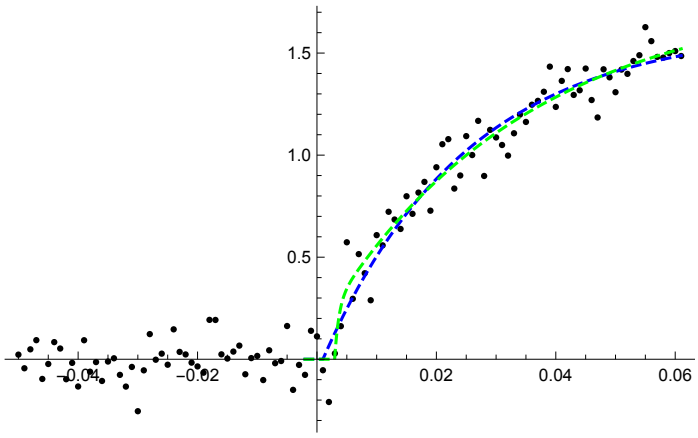


```
Mono: chi2 = 1.05028      d = 0.001      a = 1.62329      t = 0.024174
Bi: ratio chi2Mono/chi2Bi = 1.11219      d = 0.00295803      a =
 1.79733      a1 = 0.271603      t1 =0.000703208      t2 = 0.0339982
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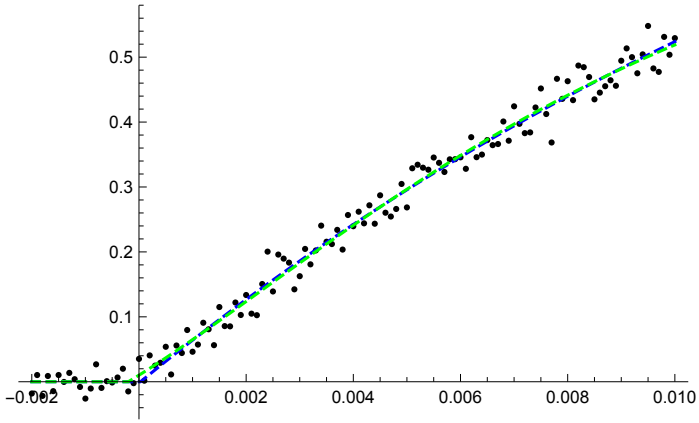


```
Mono: chi2 = 0.049871     d = 0.049871     a = 1.27429     t = 0.0188329
Bi: ratio chi2Mono/chi2Bi = 1.0185     d = -0.0002     a =
 0.835119     a1 = -0.232544     t1 =0.00310505     t2 = 0.00857539
Long trace was used for fitting.
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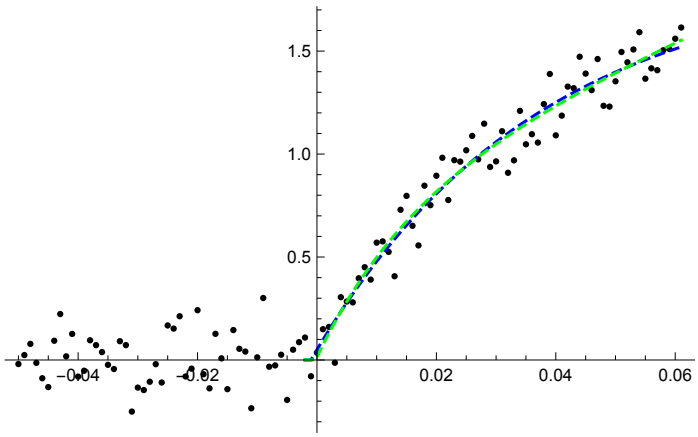


```
Mono: chi2 = 1.32479     d = -0.001     a = 1.87648     t = 0.0373146
Bi: ratio chi2Mono/chi2Bi = 1.01208     d = -0.000240377
      a = 25.0857     a1 = 0.753643     t1 =0.015764     t2 = 1.79757
-------------------------------------------------------------------------------------
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```

---------- Ca = 2.11924
uM ----------
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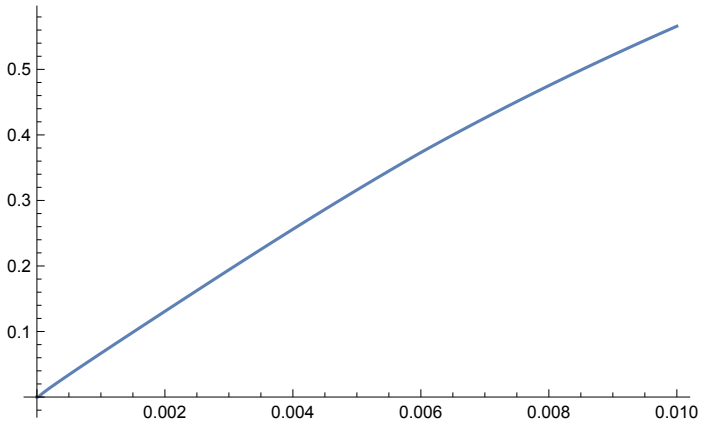


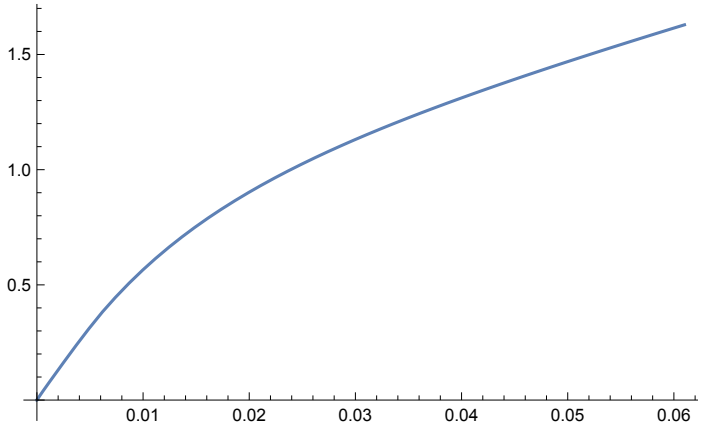


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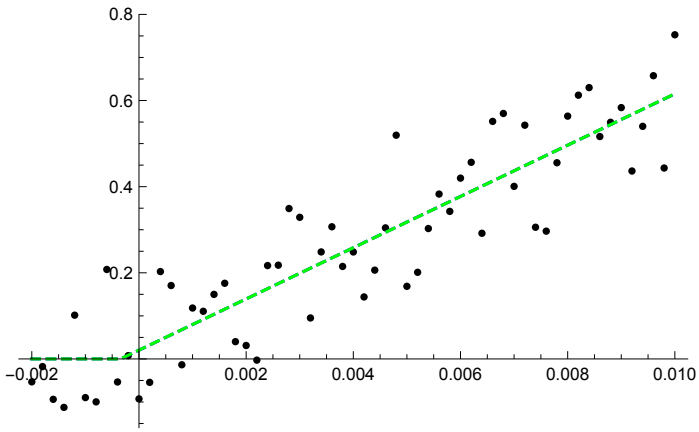


Mono: chi2 = 0.612789 d = 0.612789 a = $1.27923 \times 10^6$ t = 21496.7

Bi: ratio chi2Mono/chi2Bi = 1. d = -0.00034564 a = 57.5053 a1 = -16.0432 t1 =0.2656 t2 = 0.614192

Long trace was used for fitting.

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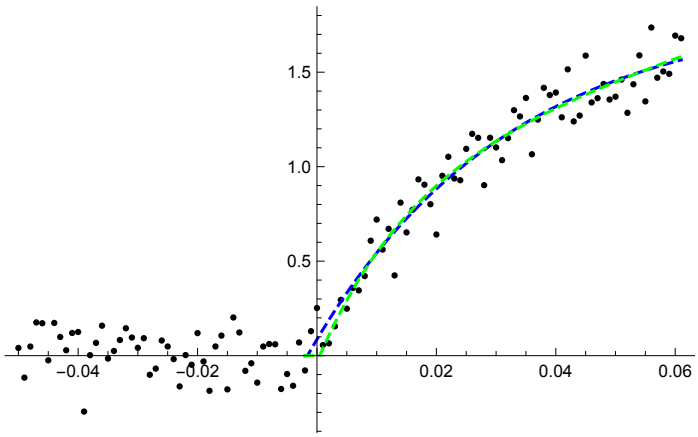


```
Mono: chi2 = 1.39959     d = -0.00158523     a = 1.84409     t = 0.0331515
Bi: ratio chi2Mono/chi2Bi = 0.992475     d = 0.000464406
      a = 12.6452     a1 = 0.957877     t1 =0.0154625     t2 = 1.06848
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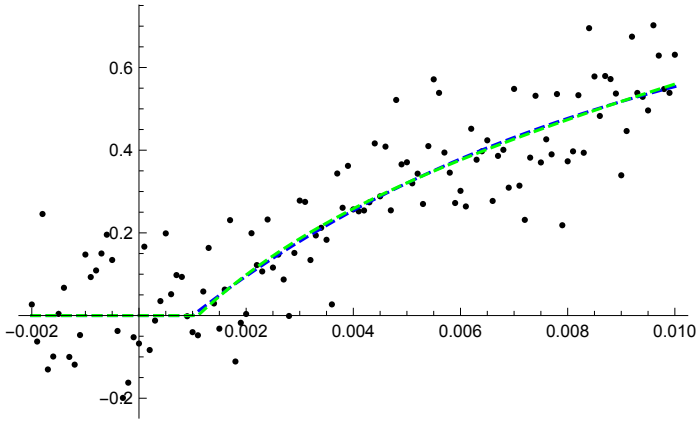


```
Mono: chi2 = 1.26591     d = 1.26591     a = 0.834102     t = 0.00825335
Bi: ratio chi2Mono/chi2Bi = 1.00569     d = 0.0011     a =
 1.75735     a1 = 0.149892     t1 =0.00216857     t2 = 0.0300148
Long trace was used for fitting.
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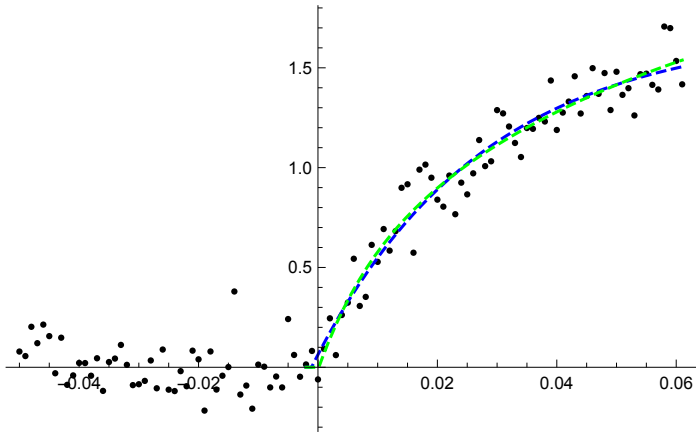


```
Mono: chi2 = 1.40533     d = -0.0010755     a = 1.69379     t = 0.0282737

Bi: ratio chi2Mono/chi2Bi = 1.02384     d = 0.000149952     a =
 2.16661     a1 = 0.480795     t1 =0.00856098     t2 = 0.0616138

------------------------------------------------------------------------- D

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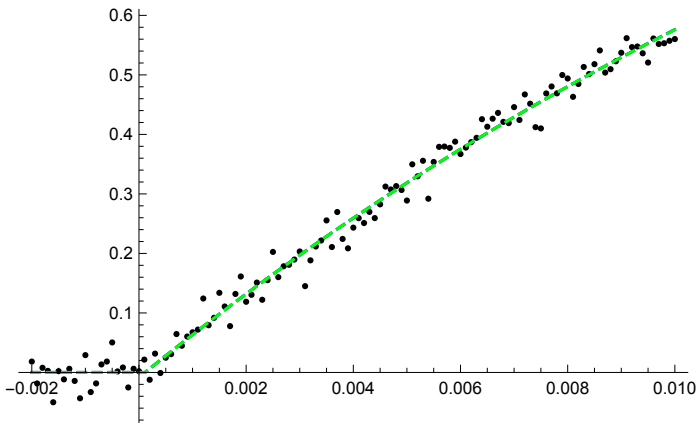


```
Mono: chi2 = 0.0517891     d = 0.0517891     a = 1.52731     t = 0.0208808
Bi: ratio chi2Mono/chi2Bi = 1.00082     d = 0.000112787
      a = 0.887662     a1 = 2.70468     t1 =0.026379     t2 = 0.061553
Long trace was used for fitting.
take bi
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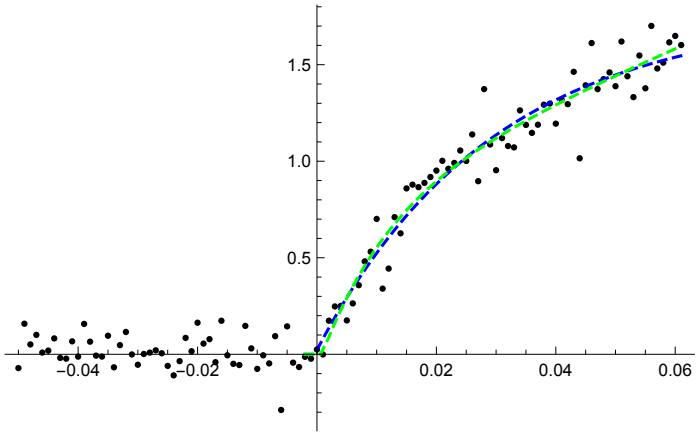


```
Mono: chi2 = 1.12527     d = -0.000372584     a = 1.76624     t = 0.0294662
Bi: ratio chi2Mono/chi2Bi = 1.04203     d = 0.000841794
      a = 35.1264     a1 = 0.788637     t1 =0.0116994     t2 = 2.51455
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 2.23489
  uM          -------------------------------------------------------
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  -------------------------
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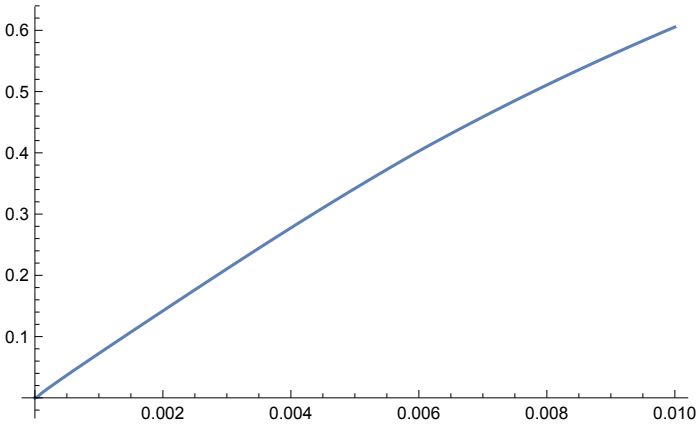

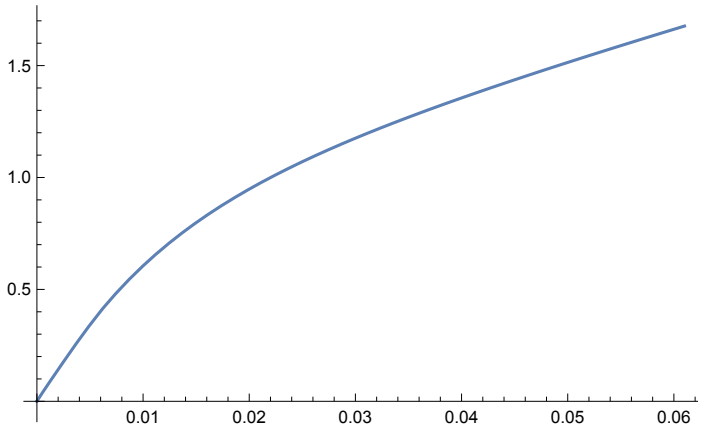


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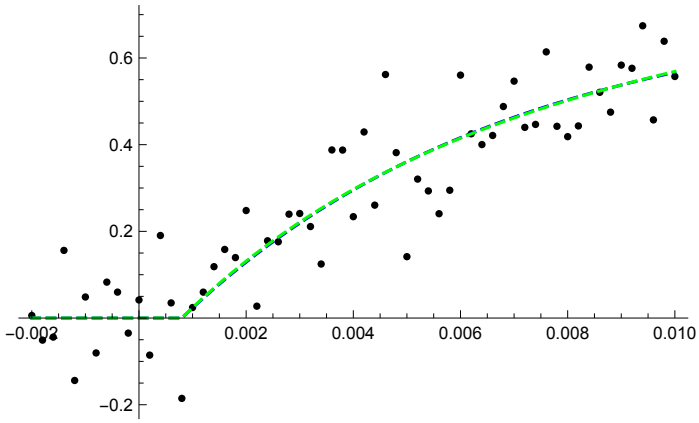


```
Mono: chi2 = 0.507059     d = 0.507059     a = 0.732355     t = 0.00619055
Bi: ratio chi2Mono/chi2Bi = 1.00344     d = 0.0008     a =
 1.62526     a1 = 0.492092     t1 =0.0046792     t2 = 0.0668318
Long trace was used for fitting.
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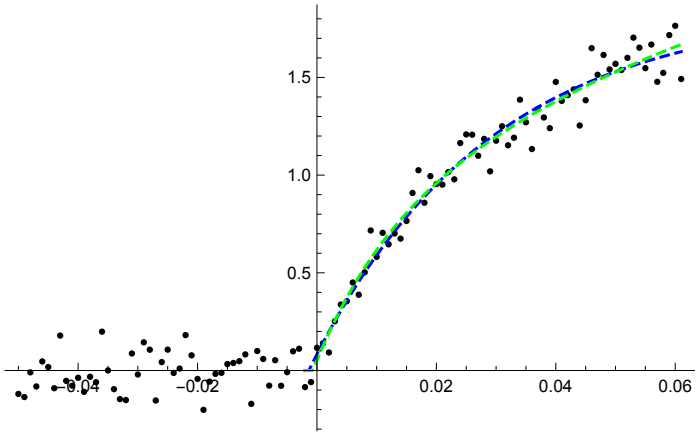


```
Mono: chi2 = 0.937142     d = -0.00135266     a = 1.86048     t = 0.0297502
Bi: ratio chi2Mono/chi2Bi = 1.02557     d = -0.000666805     a =
 2.68609     a1 = 0.635782     t1 =0.0116225     t2 = 0.0876555
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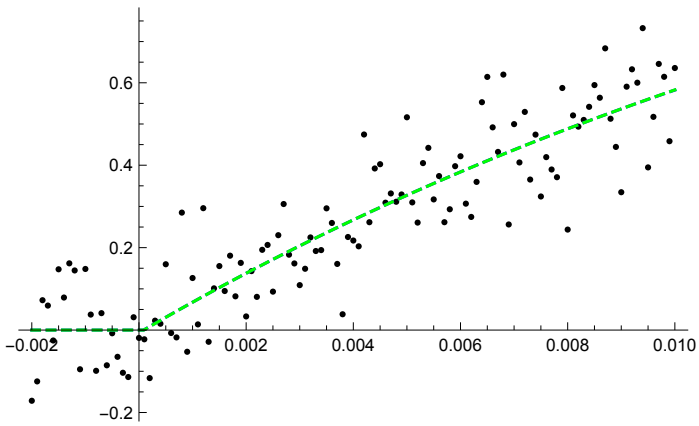

```
Mono: chi2 = 1.12832     d = 1.12832     a = 1.415     t = 0.0186968
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.0000897283     a =
 4.76626     a1 = 0.902795     t1 =0.0145274     t2 = 0.275918
Long trace was used for fitting.
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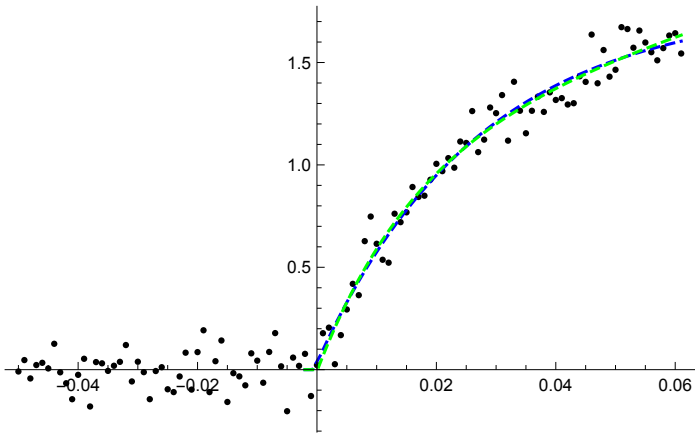


```
Mono: chi2 = 0.860188      d = -0.000507576      a = 1.78915      t = 0.0271104
Bi: ratio chi2Mono/chi2Bi = 1.01226      d = 0.0000994137
      a = 11.0336      a1 = 1.09437      t1 =0.016416      t2 = 1.03877
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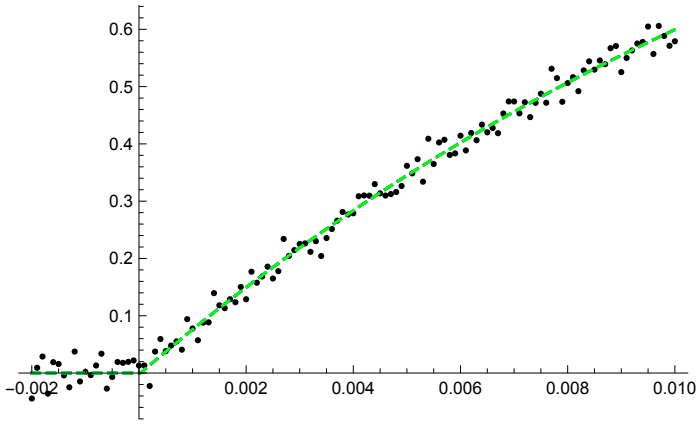


```
Mono: chi2 = 0.0400537     d = 0.0400537     a = 1.30007     t = 0.0161286
Bi: ratio chi2Mono/chi2Bi = 1.00038     d = 0.0000285641     a =
 1.04998     a1 = 1.65092     t1 =0.0179646     t2 = 0.0524694
Long trace was used for fitting.
take mono
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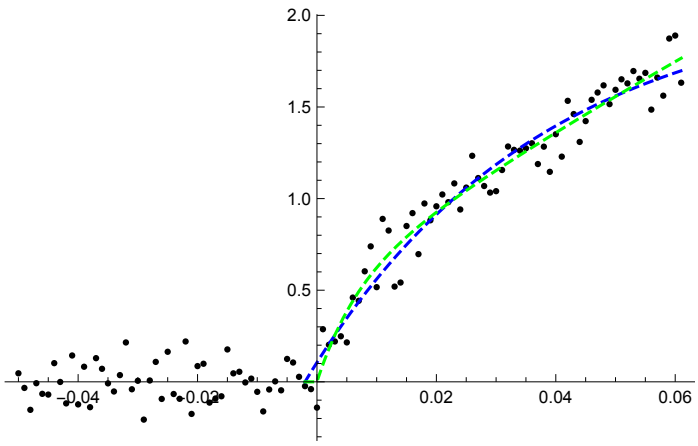


Mono: chi2 = 1.33667  d = -0.002  a = 2.11944  t = 0.0390306

Bi: ratio chi2Mono/chi2Bi = 1.09987  d = $-7.3868 \times 10^{-17}$

a = 7.8643  a1 = 0.512254  t1 =0.00654922  t2 = 0.326189

---

---------- Ca = 2.35773

uM ----------

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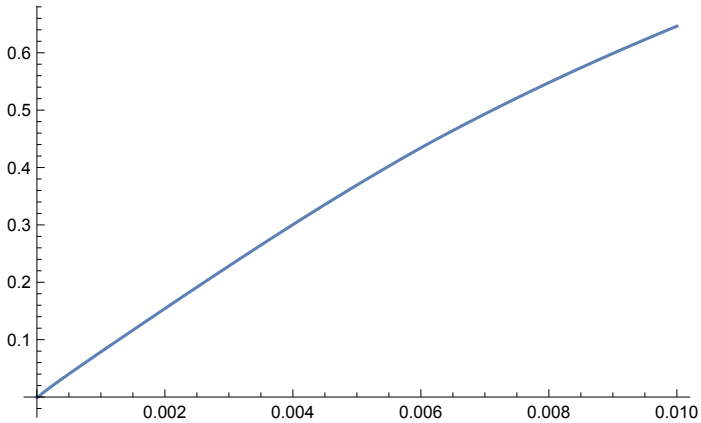


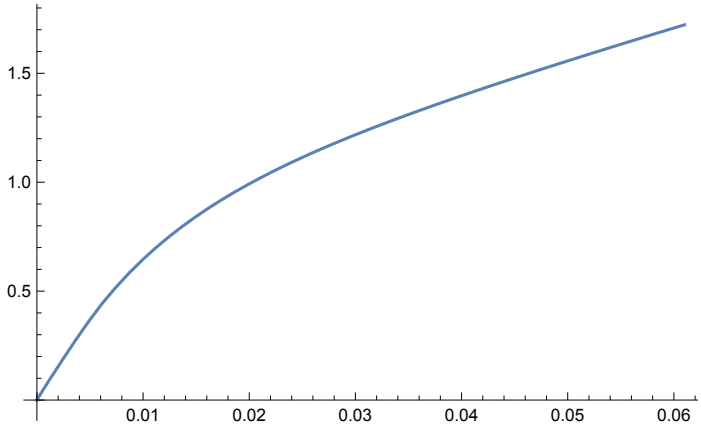


---------- C5

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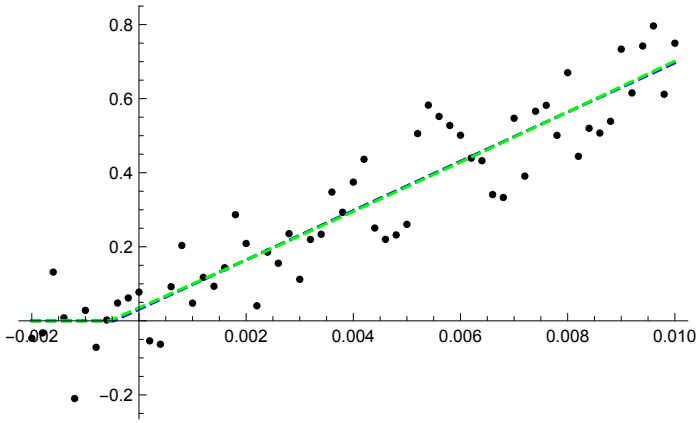


Mono: chi2 = 0.495474 d = 0.495474 a = $1.06577 \times 10^{7}$ t = 160 178.

Bi: ratio chi2Mono/chi2Bi = 1.00055 d = −0.000552204
a = 50.4149 a1 = −98.3781 t1 =0.175034 t2 = 0.237841

Long trace was used for fitting.

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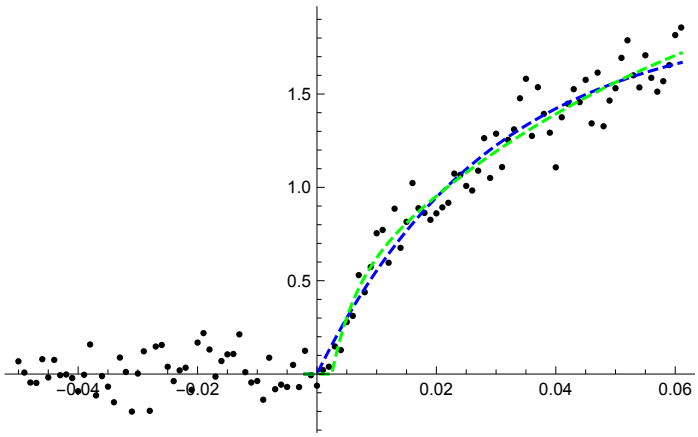


Mono: chi2 = 1.31345 d = $-3.85677 \times 10^{-16}$ a = 1.90036 t = 0.029012

Bi: ratio chi2Mono/chi2Bi = 1.07062 d = 0.00247224 a = 2.51283 a1 = 0.43818 t1 =0.00367384 t2 = 0.0608738

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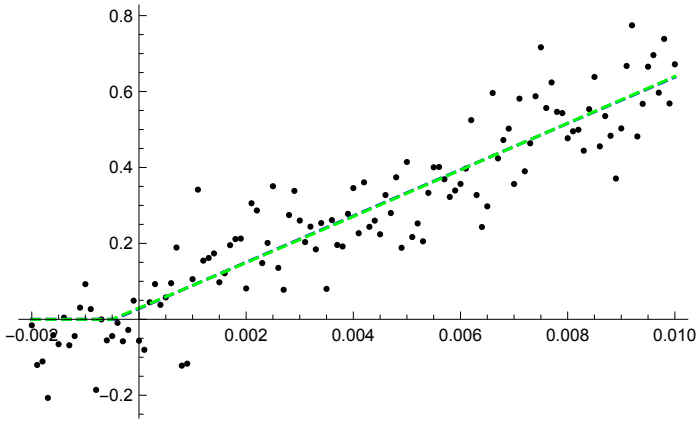


Mono: chi2 = 0.98639 d = 0.98639 a = $5.58835 \times 10^6$ t = 91642.6

Bi: ratio chi2Mono/chi2Bi = 0.999626 d = −0.0005 a = 4.89949 a1 = −1.31067 t1 =0.0205566 t2 = 0.050592

Long trace was used for fitting.

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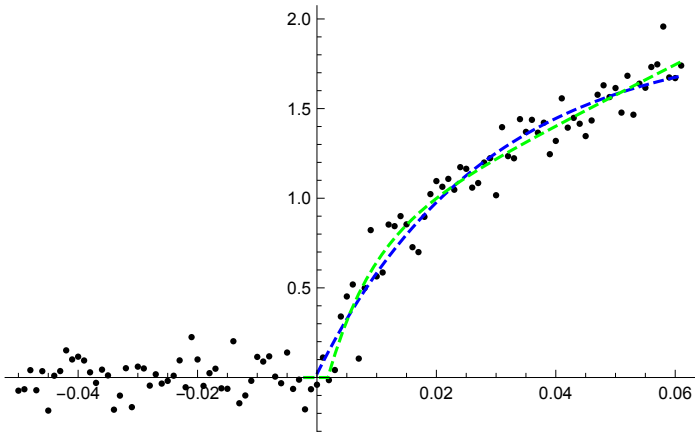


```
Mono: chi2 = 1.28148     d = -0.000293794     a = 1.89455     t = 0.0280043

Bi: ratio chi2Mono/chi2Bi = 1.08888     d = 0.00185359     a =
 23.0779     a1 = 0.742417     t1 =0.00727807     t2 = 1.26562

------------------------------------------------------------------------- D

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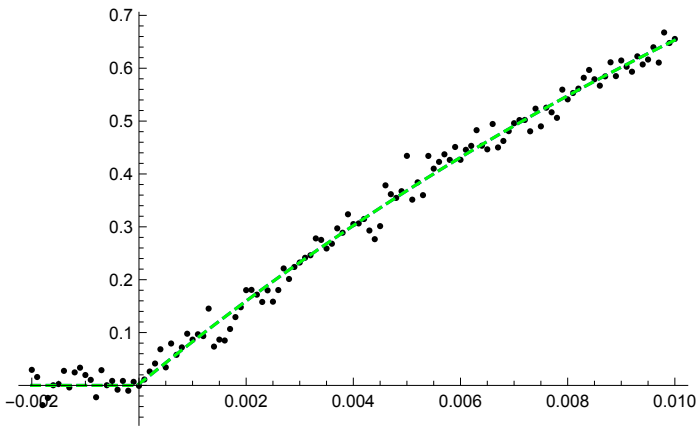


Mono: chi2 = 0.0496532 d = 0.0496532 a = 1.65037 t = 0.0198894

Bi: ratio chi2Mono/chi2Bi = 1.00037 d = -0.000024564
a = 1.21249 a1 = 1.88796 t1 =0.0212637 t2 = 0.114894

Long trace was used for fitting.

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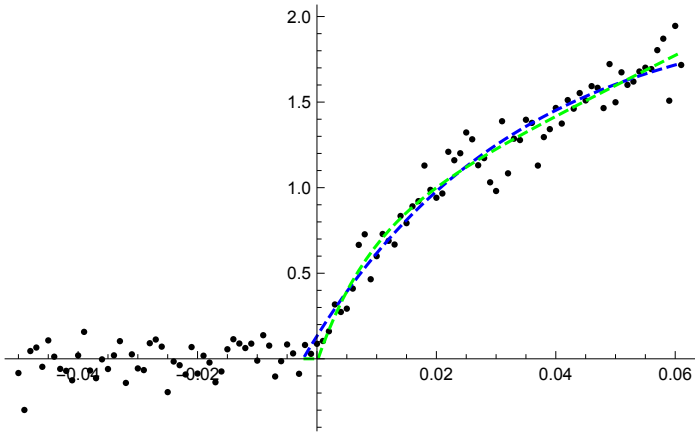
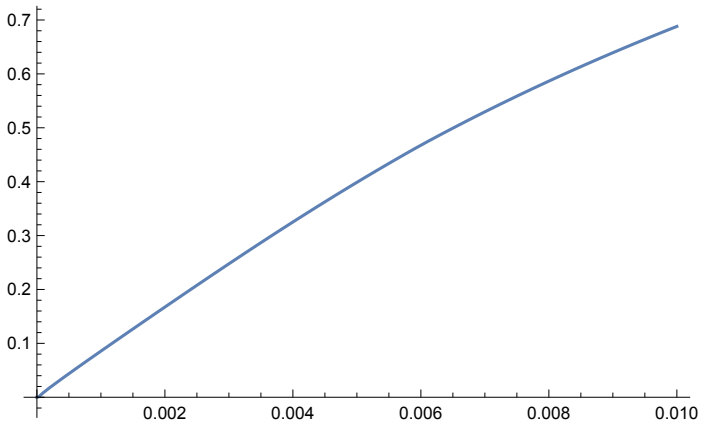
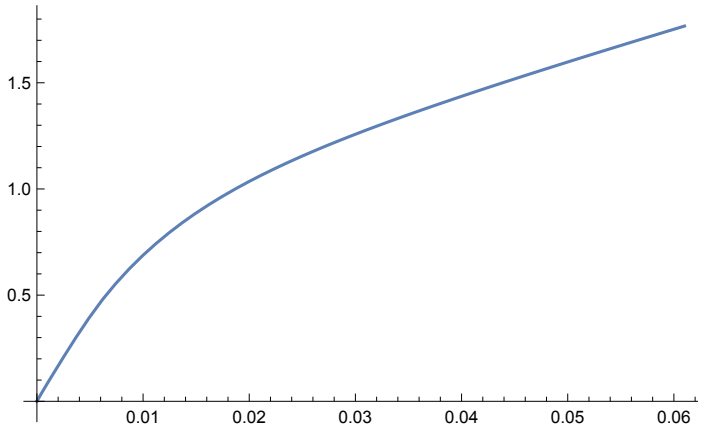



```
Mono: chi2 = 1.19084     d = -0.00231564     a = 2.05489     t = 0.0345059
Bi: ratio chi2Mono/chi2Bi = 1.07738     d = 0.00019385     a =
 49.3355     a1 = 0.717942     t1 =0.00854228     t2 = 2.72361
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 2.48791
  uM          -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```



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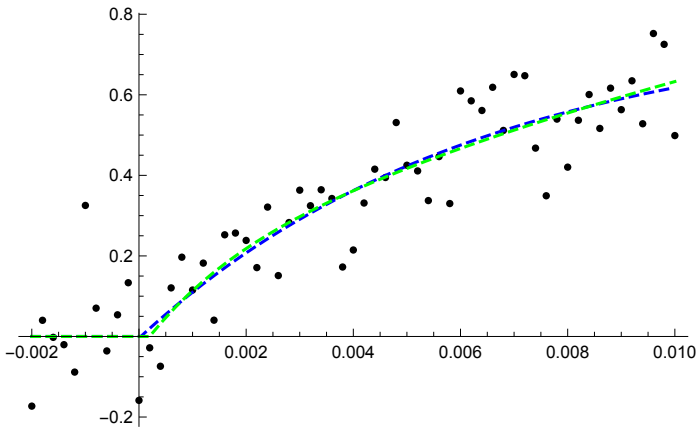


```
Mono: chi2 = 0.585062     d = 0.585062     a = 0.78044     t = 0.00635486
Bi: ratio chi2Mono/chi2Bi = 1.00213     d = 0.0002     a =
 1.44626     a1 = 0.180134     t1 =0.00165722     t2 = 0.022122
Long trace was used for fitting.
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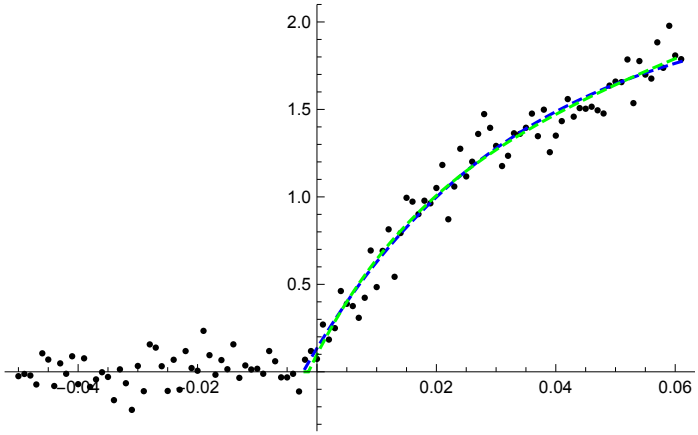


```
Mono: chi2 = 1.05456     d = -0.00230517     a = 2.12376     t = 0.0351107
Bi: ratio chi2Mono/chi2Bi = 1.01872     d = -0.00141981
      a = 34.1558     a1 = 1.04934     t1 =0.0177444     t2 = 2.59645
------------------------------------------------------------------------- C10
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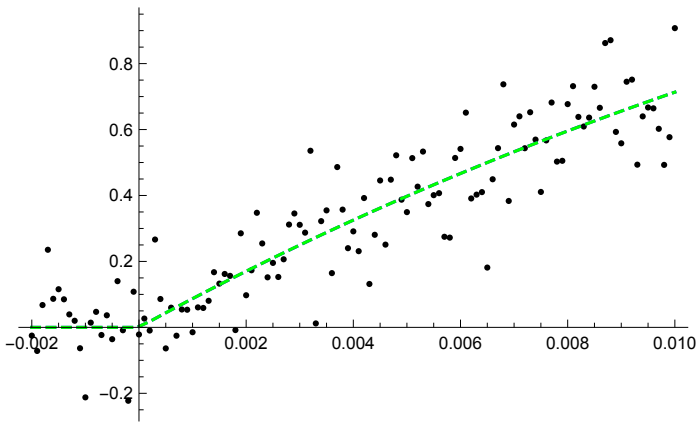

Mono: chi2 = 1.46672  d = 1.46672  a = 1.92928  t = 0.0216649

Bi: ratio chi2Mono/chi2Bi = 0.999962  d = $-1.22384 \times 10^{-17}$  a = 2.05998  a1 = 0.117269  t1 =0.00986291  t2 = 0.0250898

Long trace was used for fitting.

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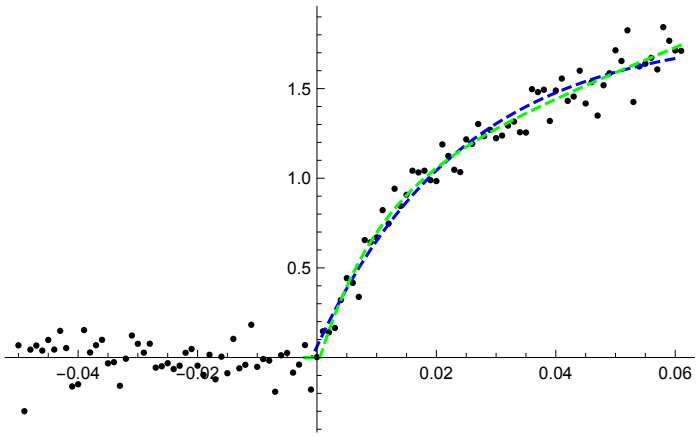


```
Mono: chi2 = 0.96579      d = -0.000835077      a = 1.81882      t = 0.0244283
Bi: ratio chi2Mono/chi2Bi = 1.08873      d = 0.000502934      a =
 26.1979      a1 = 0.906134      t1 =0.00975584      t2 = 1.79293
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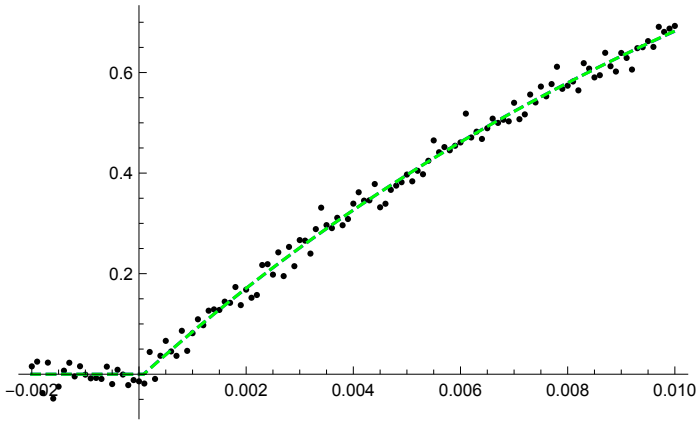


```
Mono: chi2 = 0.0424808     d = 0.0424808     a = 1.36921     t = 0.0143771

Bi: ratio chi2Mono/chi2Bi = 1.00011     d = 0.0000902276     a =
 3.67773     a1 = 0.983651     t1 =0.0118586     t2 = 0.207634

Long trace was used for fitting.

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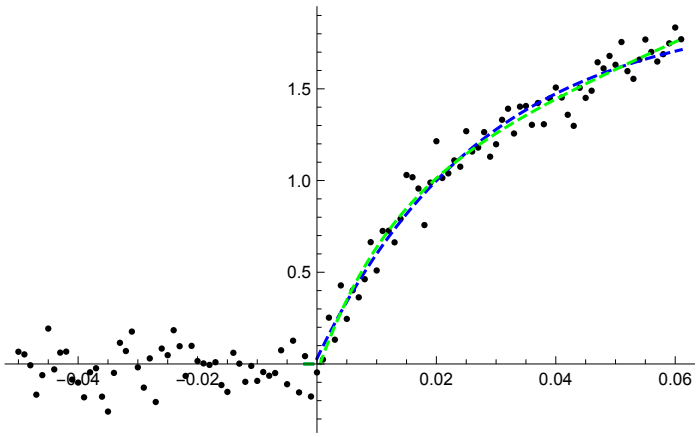


```
Mono: chi2 = 1.07585     d = -0.000431601     a = 1.92667     t = 0.0279341
Bi: ratio chi2Mono/chi2Bi = 1.05223     d = 0.000506915
      a = 29.9604     a1 = 0.90468     t1 =0.0119041     t2 = 1.9862
-------------------------------------------------------------------------------------
  --------------------------
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---------- Ca = 2.62605
uM ----------
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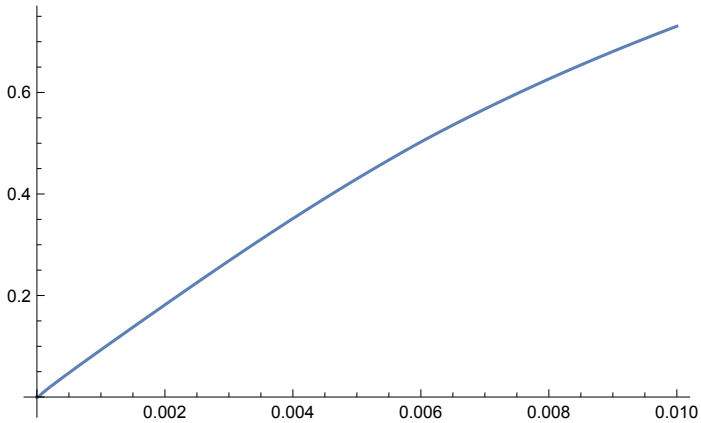


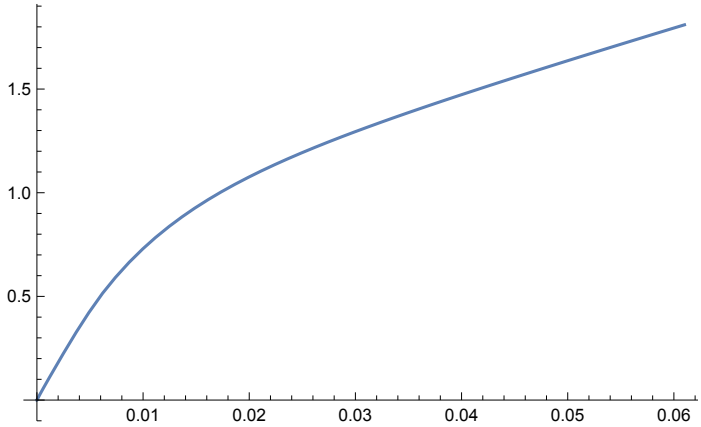


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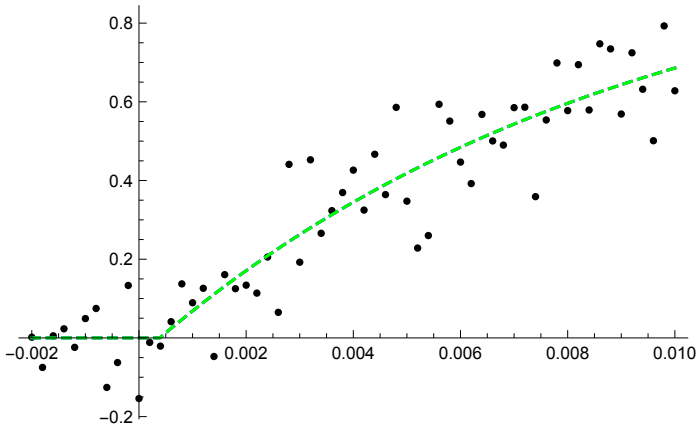


```
Mono: chi2 = 0.545602     d = 0.545602     a = 1.04879     t = 0.00905701

Bi: ratio chi2Mono/chi2Bi = 1.00001     d = 0.000386981     a =
 0.740512     a1 = 1.10966     t1 =0.00937888     t2 = 0.132271

Long trace was used for fitting.

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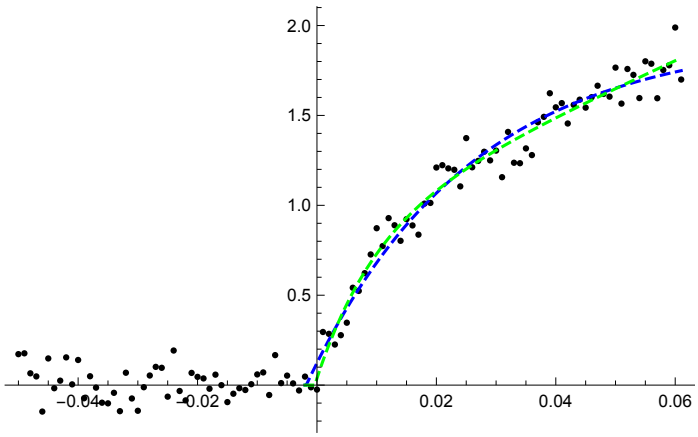


```
Mono: chi2 = 0.94495     d = -0.00179407     a = 1.94488     t = 0.0273627
Bi: ratio chi2Mono/chi2Bi = 1.09483     d = -0.000362811
      a = 20.0092     a1 = 0.865565     t1 =0.009777     t2 = 1.19804
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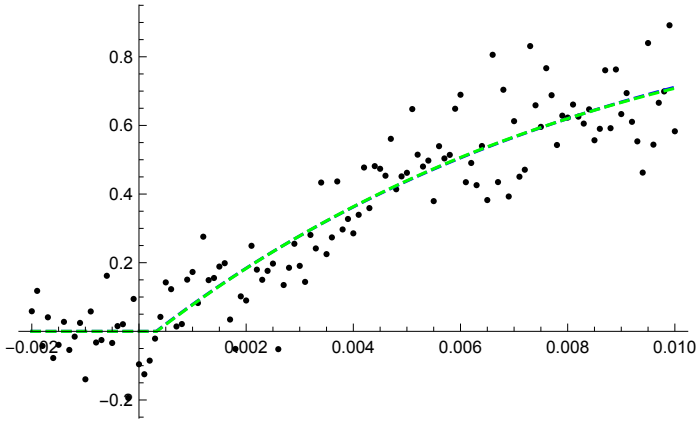


```
Mono: chi2 = 1.19504     d = 1.19504     a = 1.07715     t = 0.00896208
Bi: ratio chi2Mono/chi2Bi = 1.00229     d = 0.00033218     a =
 0.568777     a1 = 2.09264     t1 =0.0118608     t2 = 0.027031
Long trace was used for fitting.
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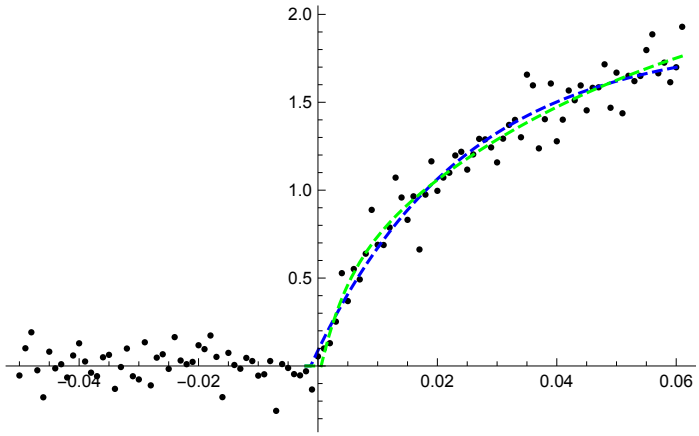


```
Mono: chi2 = 1.23773     d = -0.00121022     a = 1.86008     t = 0.0250095
Bi: ratio chi2Mono/chi2Bi = 1.07672     d = 0.000539822     a =
 2.34811     a1 = 0.48386     t1 =0.0043858     t2 = 0.0521736
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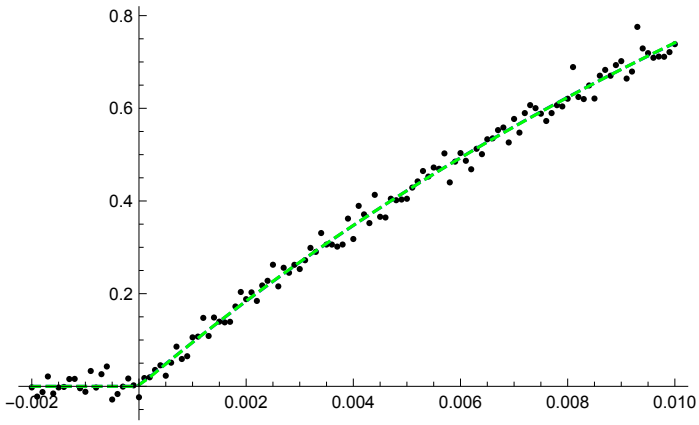


Mono: chi2 = 0.0469049 d = 0.0469049 a = 1.72874 t = 0.0178908

Bi: ratio chi2Mono/chi2Bi = 1.0019 d = $-5.48809 \times 10^{-16}$ a = 2.26226 a1 = 0.361723 t1 =0.00906629 t2 = 0.0327761

Long trace was used for fitting.

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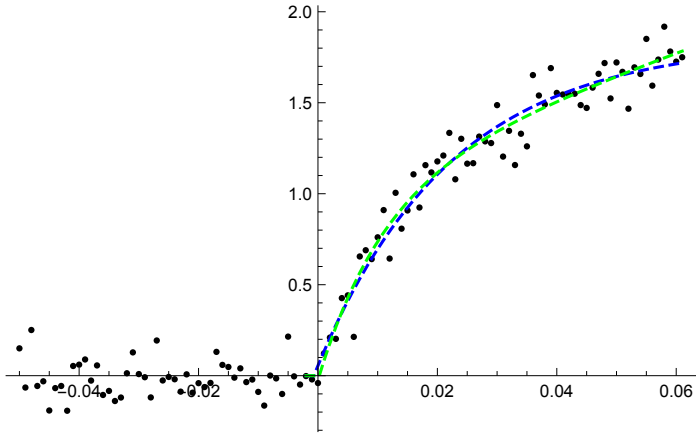


```
Mono: chi2 = 1.21383     d = -0.000681904     a = 1.83565     t = 0.0224082
Bi: ratio chi2Mono/chi2Bi = 1.05536     d = 0.000226306
      a = 17.9833     a1 = 1.03518     t1 =0.0108833     t2 = 1.33835
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 2.77177
  uM          -------------------------------------------------------
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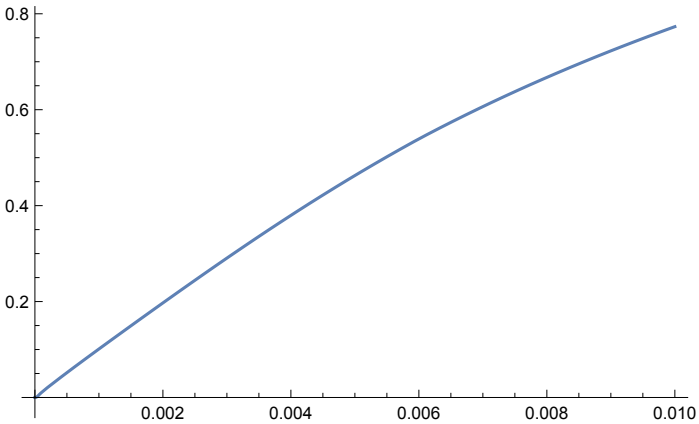

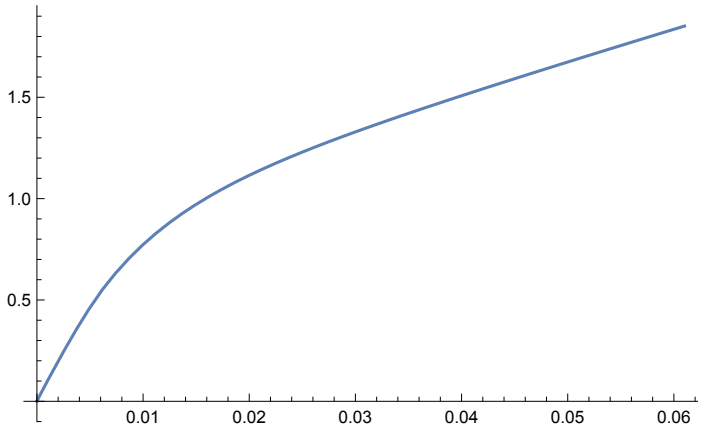


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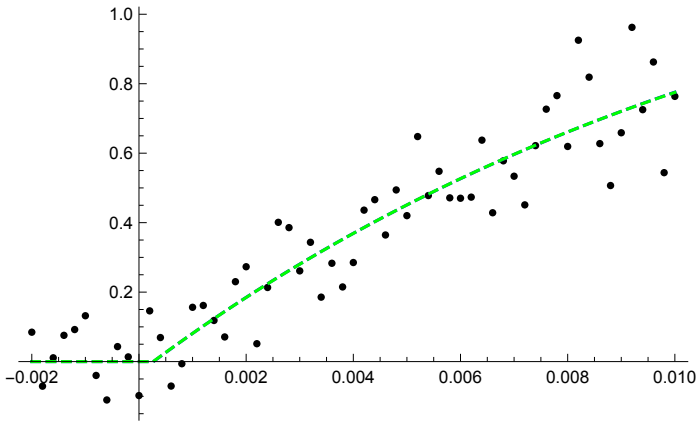


```
Mono: chi2 = 0.631122     d = 0.631122     a = 1.44467     t = 0.0126405
Bi: ratio chi2Mono/chi2Bi = 1.00011     d = 0.000264692     a =
 0.766123     a1 = 2.74218     t1 =0.0167134     t2 = 0.0390828
Long trace was used for fitting.
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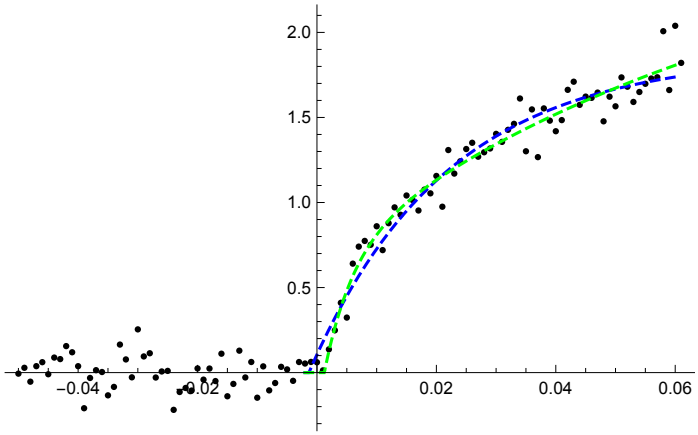


```
Mono: chi2 = 1.11521     d = -0.00134349     a = 1.8674     t = 0.0229892
Bi: ratio chi2Mono/chi2Bi = 1.15955     d = 0.00123123     a =
 2.76304     a1 = 0.691258     t1 =0.00468827     t2 = 0.0759869
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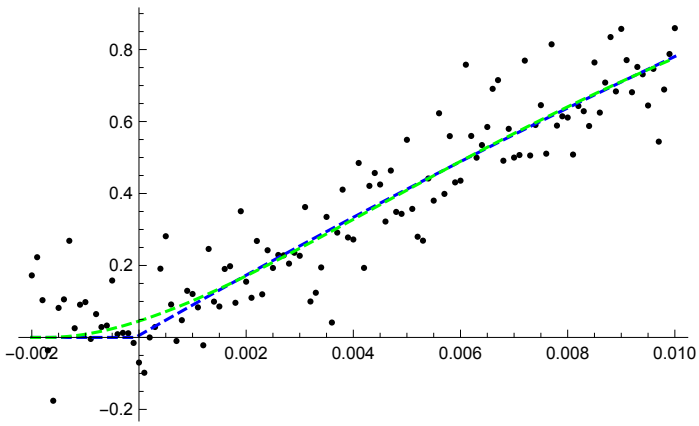

```
Mono: chi2 = 1.21508     d = 1.21508     a = 4.38753     t = 0.0513609
Bi: ratio chi2Mono/chi2Bi = 1.01303     d = -0.00169882     a =
 1.4588     a1 = -1.146     t1 =0.00414811     t2 = 0.00940195
Long trace was used for fitting.
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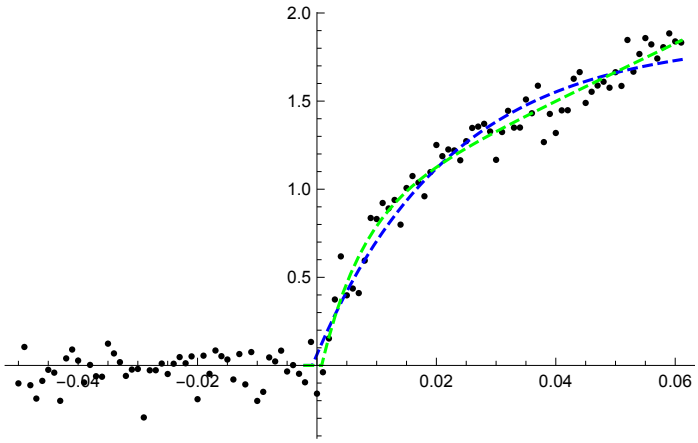


```
Mono: chi2 = 1.2111     d = -0.000766959     a = 1.85409     t = 0.022467
Bi: ratio chi2Mono/chi2Bi = 1.25056     d = 0.000796009     a =
 48.8072     a1 = 0.856033     t1 =0.00671335     t2 = 2.89266
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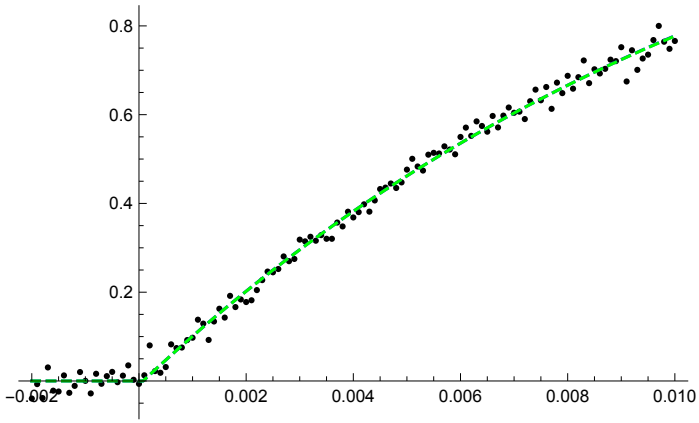


```
Mono: chi2 = 0.044908     d = 0.044908     a = 1.42033     t = 0.0125101

Bi: ratio chi2Mono/chi2Bi = 1.00338     d = 0.0000765327     a =
 1.09801     a1 = 1.91927     t1 =0.0143453     t2 = 0.0397926

Long trace was used for fitting.

take bi

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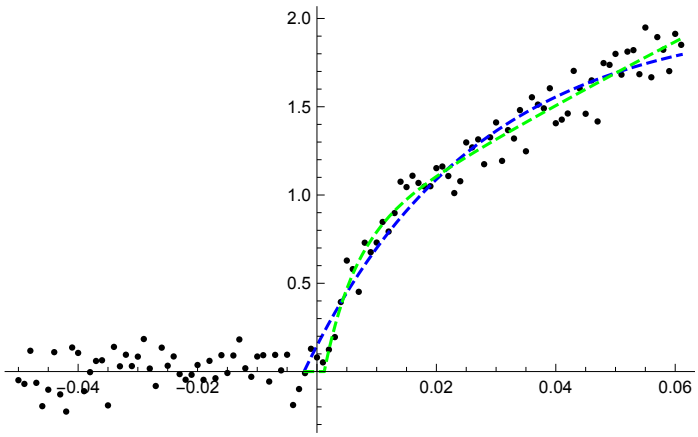


```
Mono: chi2 = 1.22252     d = -0.00216235     a = 2.01582     t = 0.0285395
Bi: ratio chi2Mono/chi2Bi = 1.18082     d = 0.00122177     a =
 7.82044     a1 = 0.741569     t1 =0.00505959     t2 = 0.339021
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---------- Ca = 2.92648

uM ----------

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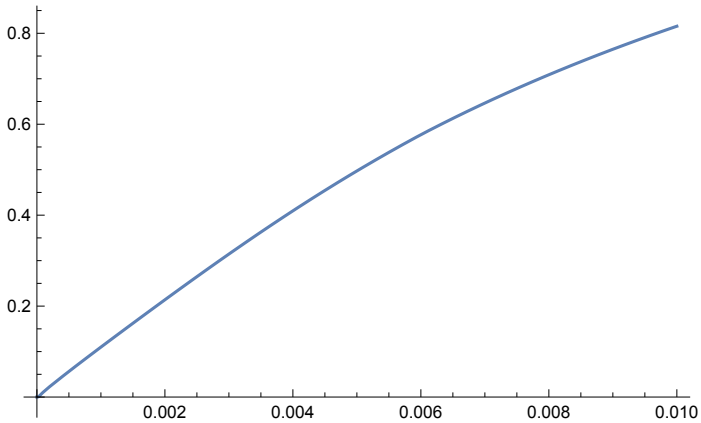


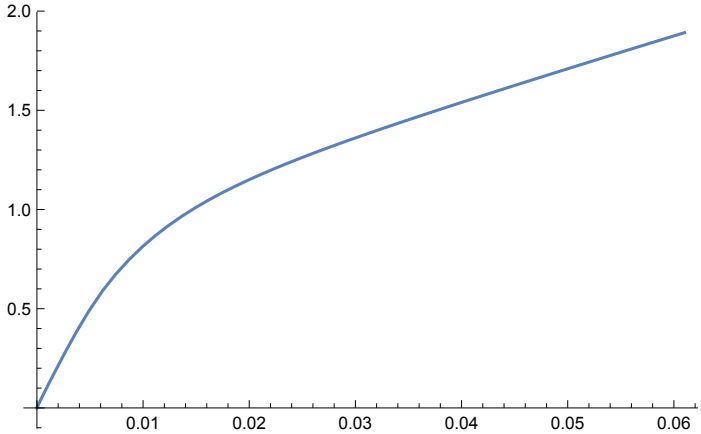


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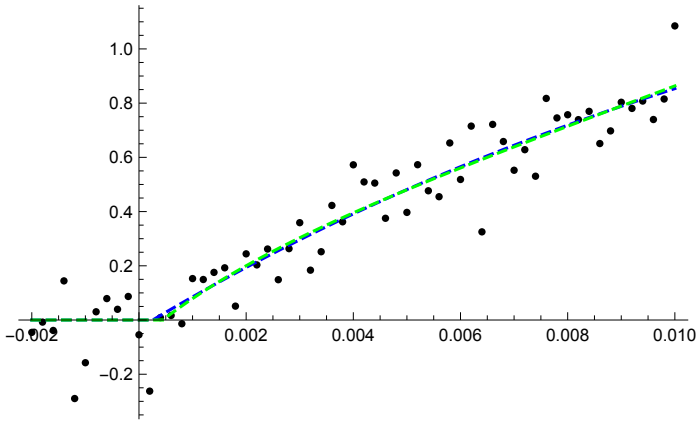


```
Mono: chi2 = 0.629337     d = 0.629337     a = 1.85073     t = 0.015754

Bi: ratio chi2Mono/chi2Bi = 1.00508     d = 0.000441326     a =
 55.555     a1 = 0.163779     t1 =0.00212243     t2 = 0.750057

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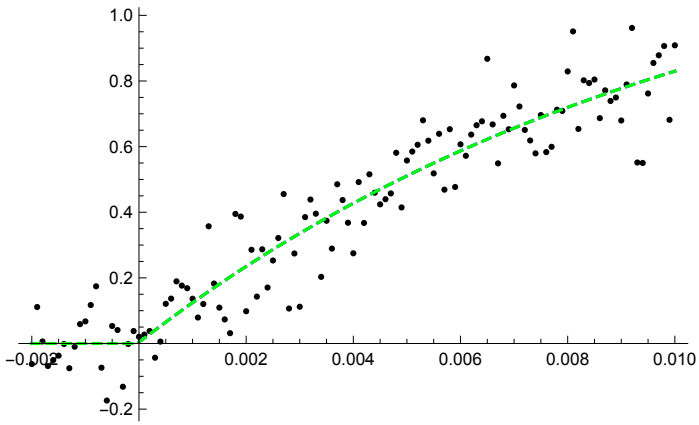


```
Mono: chi2 = 1.10867     d = 1.10867     a = 1.36916     t = 0.0107601
Bi: ratio chi2Mono/chi2Bi = 1.00003     d = -0.0000247266
      a = 1.04485     a1 = 1.37968     t1 =0.010811     t2 = 0.806735
Long trace was used for fitting.
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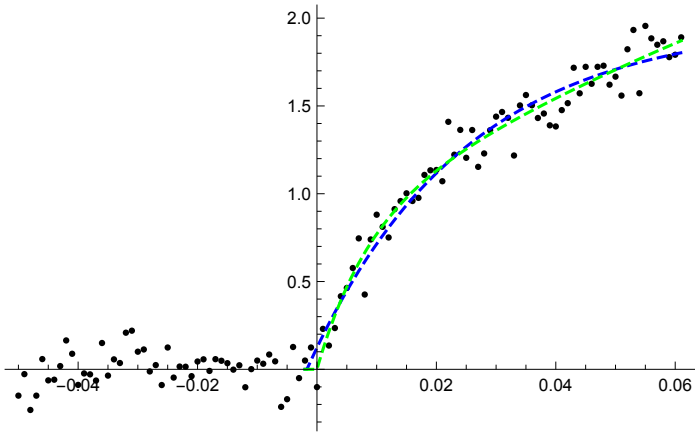


Mono: chi2 = 1.18931 d = -0.00167959 a = 1.98374 t = 0.0261751

Bi: ratio chi2Mono/chi2Bi = 1.11227 d = $-4.16057 \times 10^{-16}$ a = 4.40236 a1 = 0.819035 t1 =0.00834889 t2 = 0.175361

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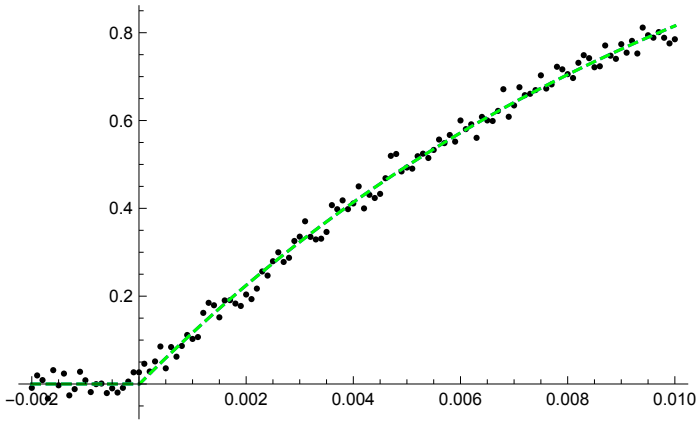


Mono: chi2 = 0.0486792 d = 0.0486792 a = 1.38532 t = 0.0112464

Bi: ratio chi2Mono/chi2Bi = 1. d = $9.69352 \times 10^{-6}$ a = 1.38532 a1 = 0.804452 t1 =0.0112464 t2 = 0.0112464

Long trace was used for fitting.

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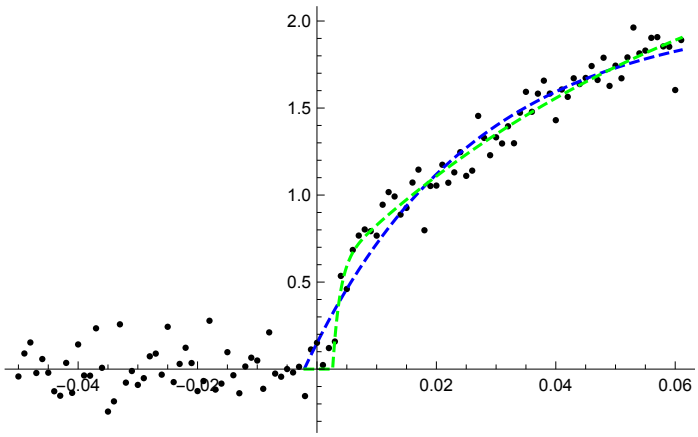


```
Mono: chi2 = 1.47438     d = -0.00212854     a = 2.04811     t = 0.0279774
Bi: ratio chi2Mono/chi2Bi = 1.20677     d = 0.0026256     a =
 2.84719     a1 = 0.593898     t1 =0.0011885     t2 = 0.0670262
-------------------------------------------------------------------------------------
  --------------------------
```

---------- Ca = 3.0905
uM ----------
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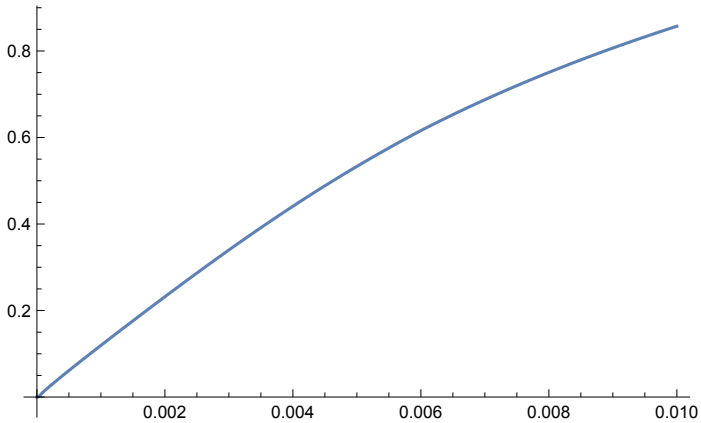


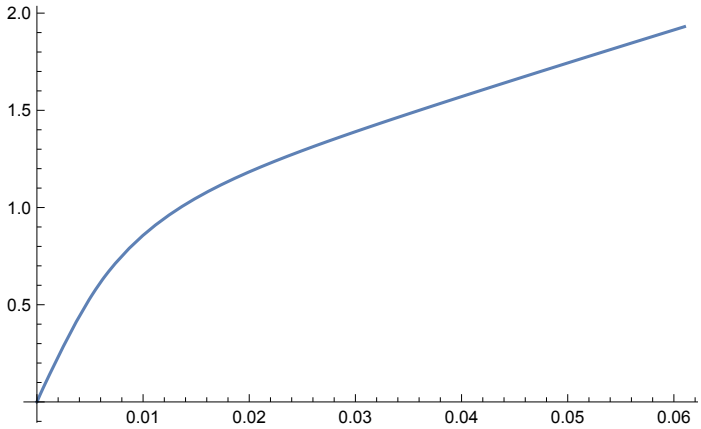


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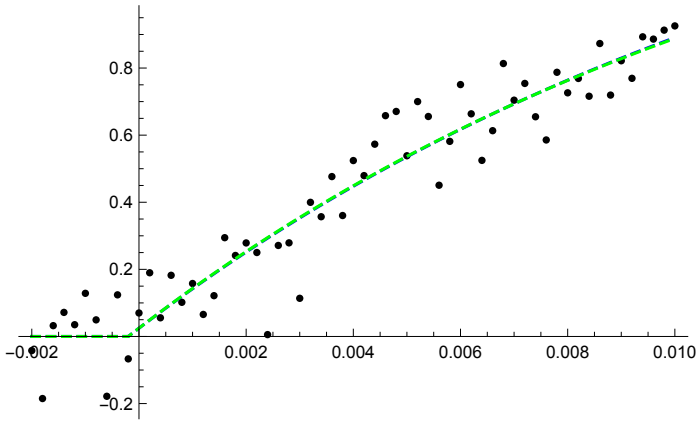


```
Mono: chi2 = 0.549021     d = 0.549021     a = 1.69807     t = 0.0137231

Bi: ratio chi2Mono/chi2Bi = 0.999801     d = -0.0002     a =
 1.72401     a1 = 1.64306     t1 =0.0132223     t2 = 0.167422

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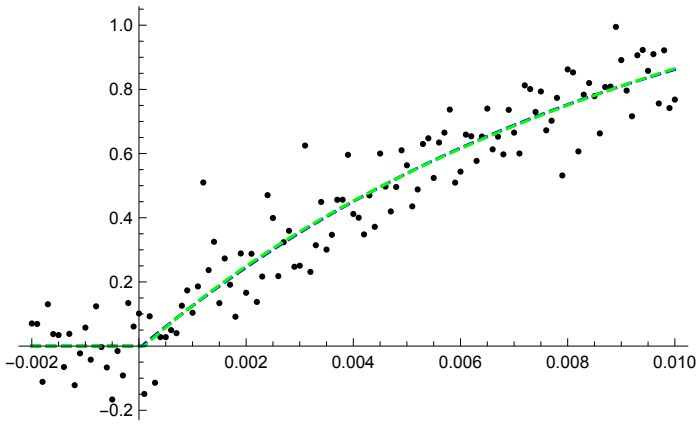


```
Mono: chi2 = 1.05721     d = 1.05721     a = 1.33425     t = 0.00957358
Bi: ratio chi2Mono/chi2Bi = 1.002     d = 0.0001     a =
 1.60116     a1 = 0.143059     t1 =0.00294497     t2 = 0.014344
Long trace was used for fitting.
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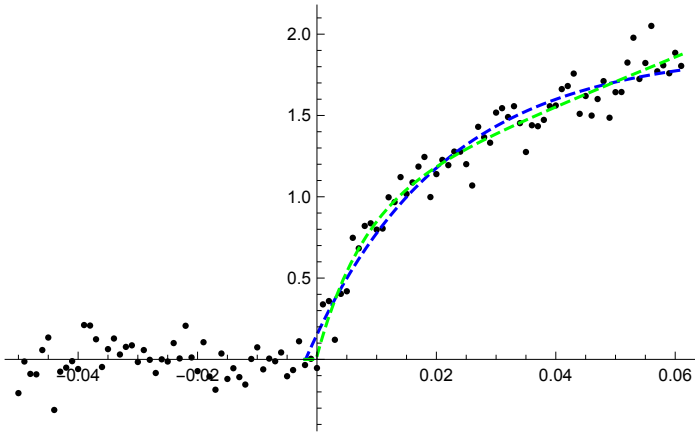


```
Mono: chi2 = 1.39978     d = -0.00190016     a = 1.89679     t = 0.022612
Bi: ratio chi2Mono/chi2Bi = 1.1312     d = -0.000138827     a =
 24.1376     a1 = 0.937504     t1 =0.00762443     t2 = 1.48275
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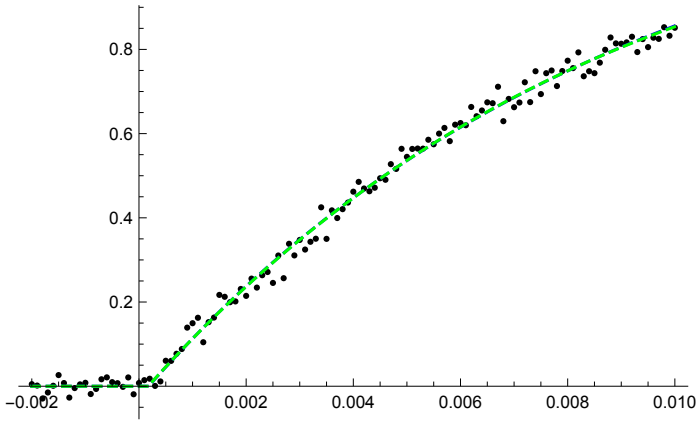


```
Mono: chi2 = 0.0542844     d = 0.0542844     a = 1.27791     t = 0.00886637
Bi: ratio chi2Mono/chi2Bi = 1.01047     d = 0.000171819     a =
 0.769133     a1 = 2.24888     t1 =0.0115288     t2 = 0.0281517
Long trace was used for fitting.
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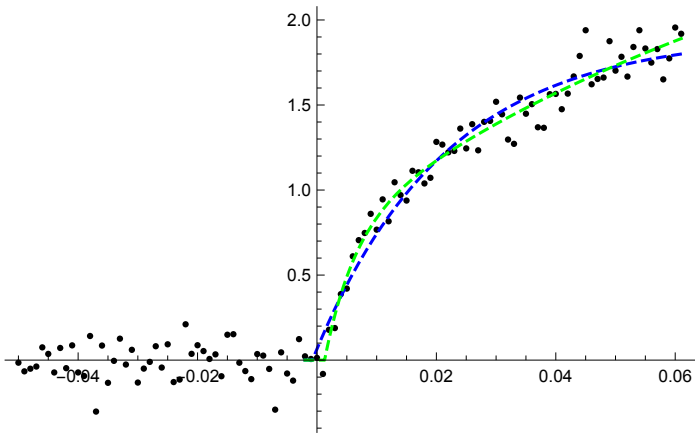


```
Mono: chi2 = 1.25624     d = -0.000759105     a = 1.9141     t = 0.0219203
Bi: ratio chi2Mono/chi2Bi = 1.21575     d = 0.00127703     a =
 3.14407     a1 = 0.75118     t1 =0.00497846     t2 = 0.0923854
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---------- Ca = 3.26357

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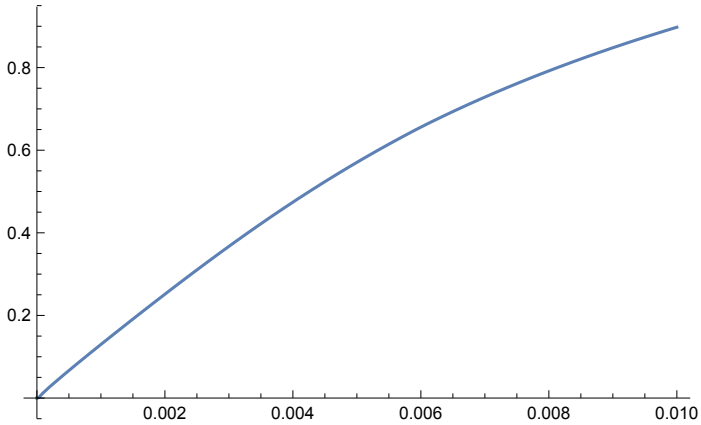


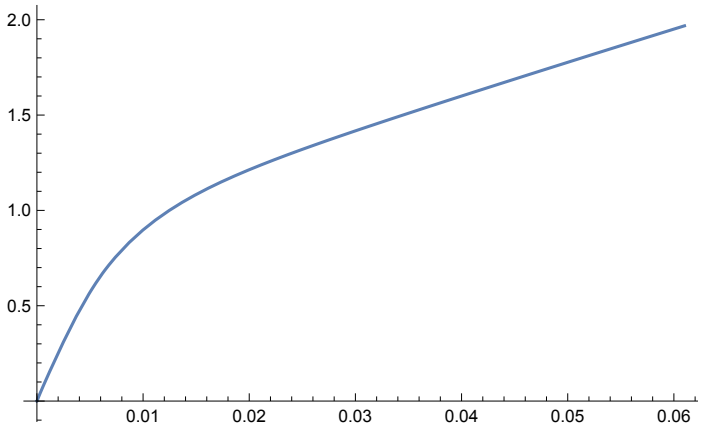


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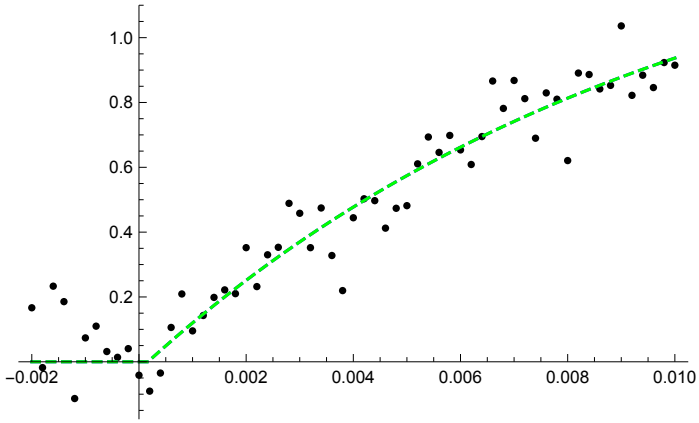


```
Mono: chi2 = 0.479379     d = 0.479379     a = 1.49101     t = 0.00993266

Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000167268     a =
 1.49101     a1 = 0.653417     t1 =0.00993266     t2 = 0.00993266

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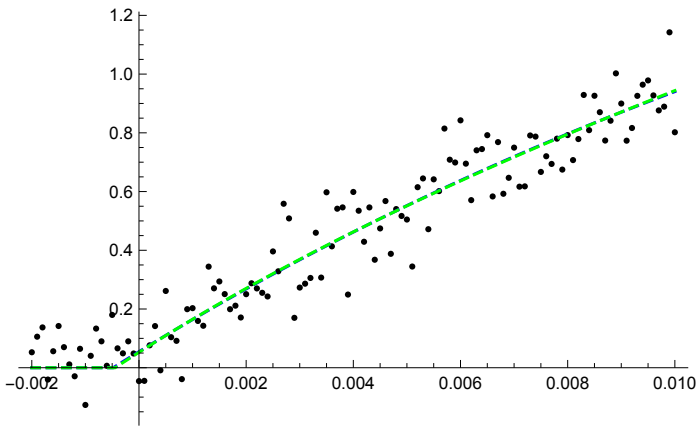


```
Mono: chi2 = 1.06369     d = 1.06369     a = 2.32437     t = 0.0202107
Bi: ratio chi2Mono/chi2Bi = 1.00031     d = -0.000444716     a =
 18.099     a1 = 0.401364     t1 =0.00682913     t2 = 0.288459
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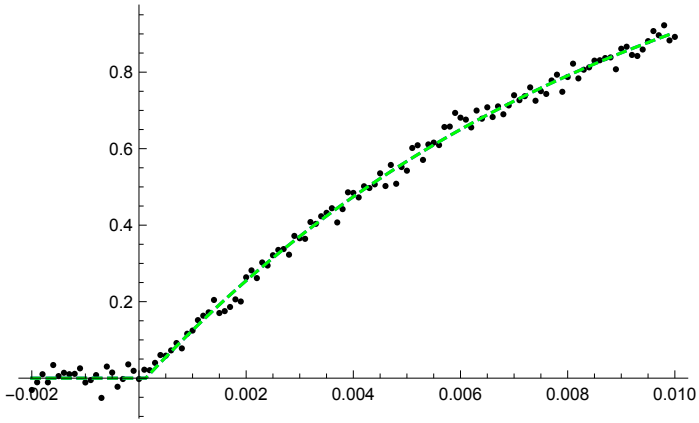


```
Mono: chi2 = 0.0439972     d = 0.0439972     a = 1.35645     t = 0.00899939
Bi: ratio chi2Mono/chi2Bi = 1.00021     d = 0.00012636     a =
 1.13266     a1 = 1.36662     t1 =0.00904317     t2 = 0.518174
--------------------------------------------------------------------------------
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----------------     Ca = 3.44741
  uM         -------------------------------------------------------
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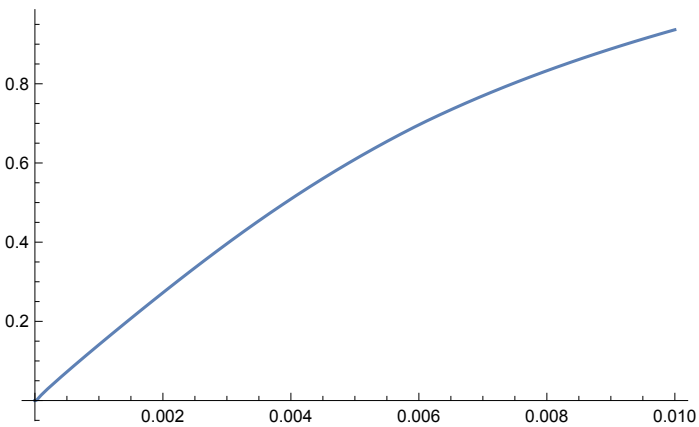

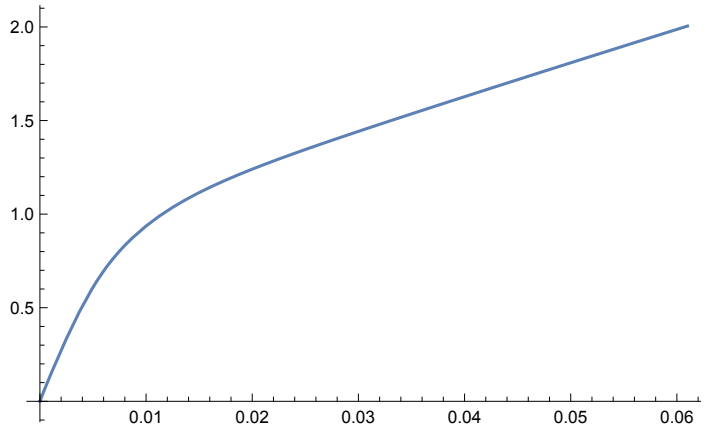


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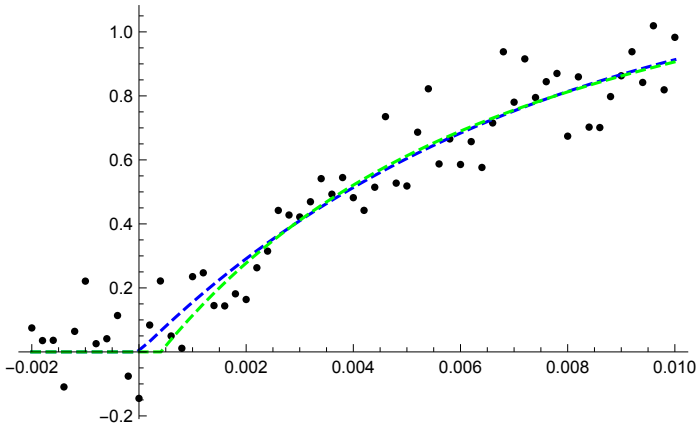


```
Mono: chi2 = 0.516618     d = 0.516618     a = 1.23478     t = 0.00743549
Bi: ratio chi2Mono/chi2Bi = 0.968003     d = 0.000408289     a =
 6.05034     a1 = 0.737791     t1 =0.00410542     t2 = 0.207591
------------------------------------------------------------------------ C10
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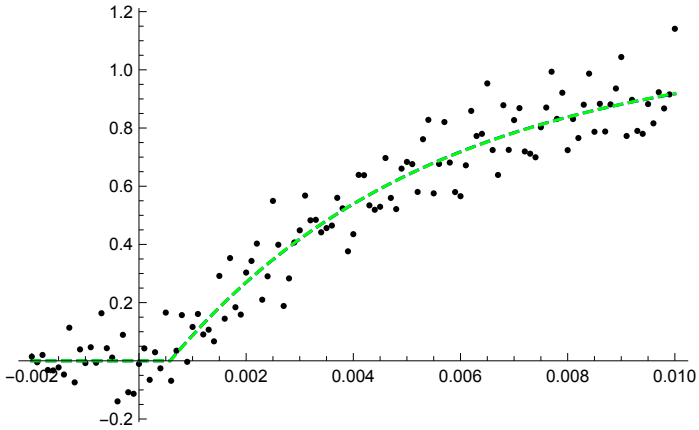


```
Mono: chi2 = 0.903365     d = 0.903365     a = 1.07561     t = 0.00491516
Bi: ratio chi2Mono/chi2Bi = 1.00003     d = 0.000587614     a =
 1.92331     a1 = 1.00067     t1 =0.00464036     t2 = 0.170049
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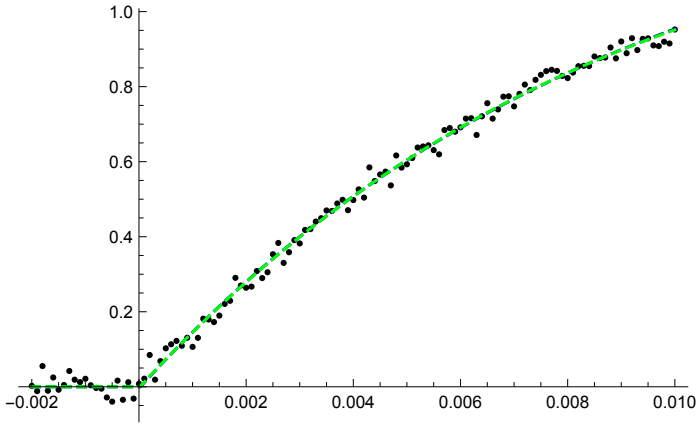

```
Mono: chi2 = 0.052497     d = 0.052497     a = 1.42602     t = 0.00902549
Bi: ratio chi2Mono/chi2Bi = 1.01697     d = 0.0000199365     a =
 0.709506     a1 = 2.98546     t1 =0.0125773     t2 = 0.0279271
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 3.64088
  uM         -------------------------------------------------------
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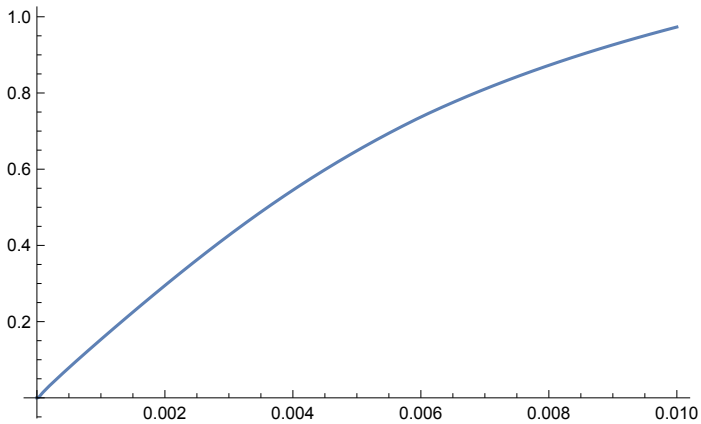


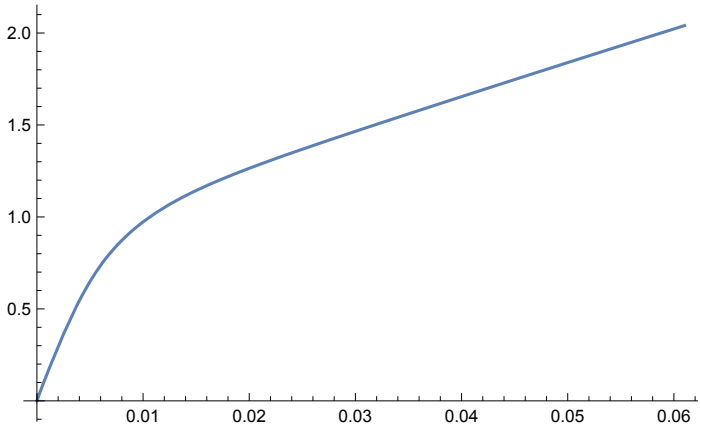


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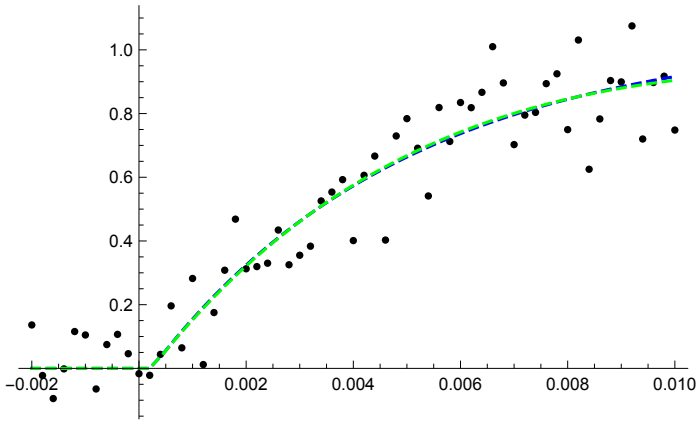


```
Mono: chi2 = 0.673273     d = 0.673273     a = 1.053     t = 0.00478755

Bi: ratio chi2Mono/chi2Bi = 1.01346     d = 0.000232517     a =
 0.449836     a1 = 2.47483     t1 =0.00729906     t2 = 0.0160957

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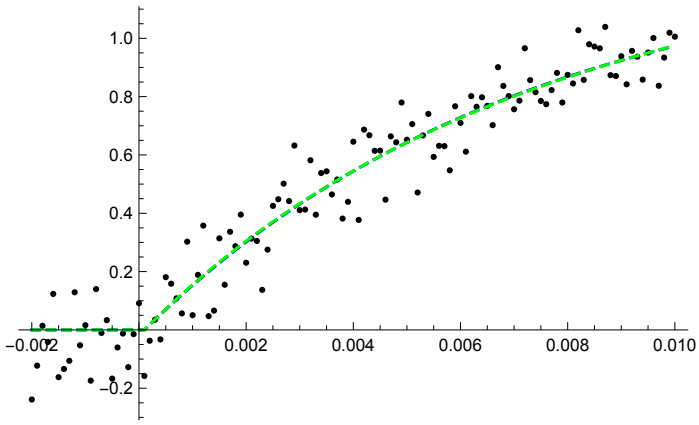


```
Mono: chi2 = 1.0446     d = 1.0446     a = 1.30374     t = 0.00720949
Bi: ratio chi2Mono/chi2Bi = 1.00044     d = 0.0001     a =
 1.59116     a1 = 0.839513     t1 =0.00563975     t2 = 0.0211732
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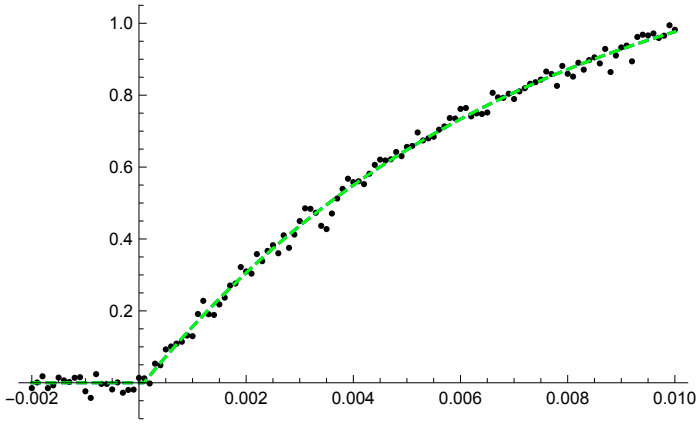


```
Mono: chi2 = 0.0440079     d = 0.0440079     a = 1.29659     t = 0.0070838
Bi: ratio chi2Mono/chi2Bi = 0.99999     d = 0.0000921285     a =
 1.32029     a1 = 1.29536     t1 =0.00707935     t2 = 0.400071
------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 3.84593
  uM         -------------------------------------------------------
------------------------------------------------------------------------------------
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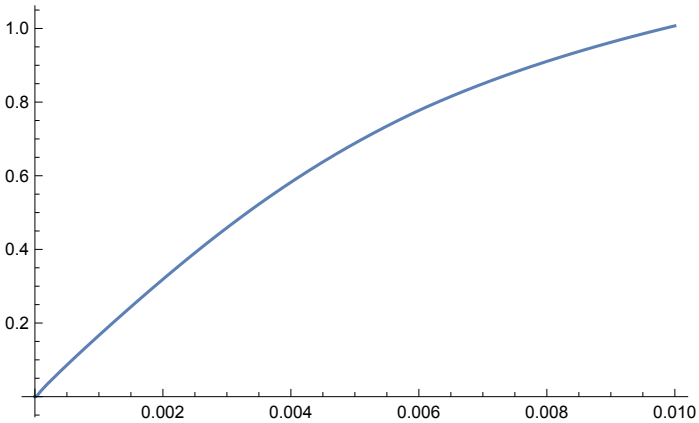
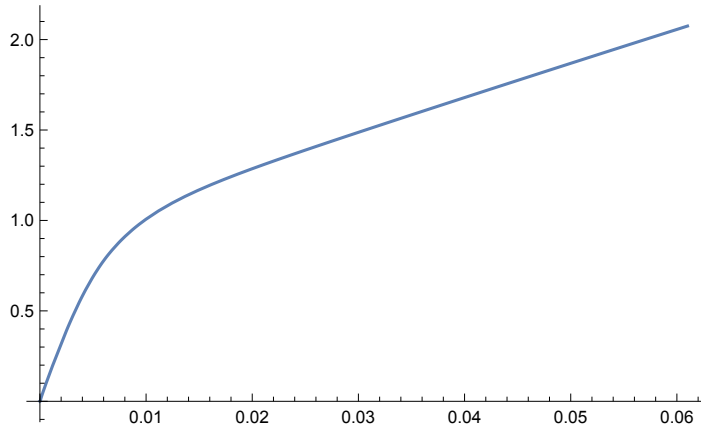
```



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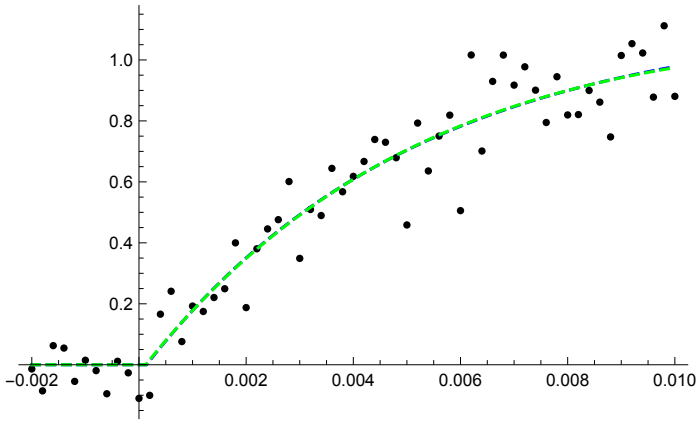


```
Mono: chi2 = 0.591074     d = 0.591074     a = 1.14127     t = 0.00506584
Bi: ratio chi2Mono/chi2Bi = 1.00079     d = 0.000127754     a =
 0.82583     a1 = 1.45551     t1 =0.00591516     t2 = 0.0248454
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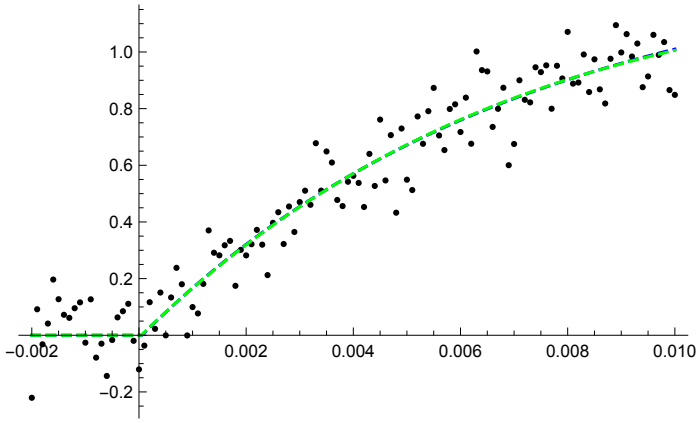


```
Mono: chi2 = 1.07686     d = 1.07686     a = 1.34343     t = 0.00713836
Bi: ratio chi2Mono/chi2Bi = 1.00286     d = 0.0000416563     a =
 0.587823     a1 = 3.09673     t1 =0.0105023     t2 = 0.0226827
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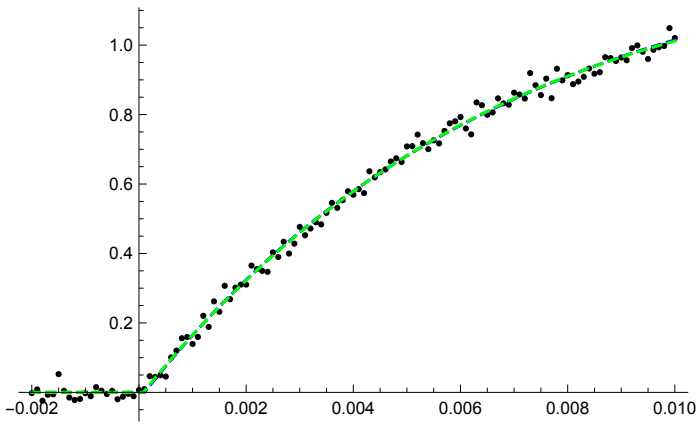

```
Mono: chi2 = 0.0474997     d = 0.0474997     a = 1.31718     t = 0.006726
Bi: ratio chi2Mono/chi2Bi = 1.01223     d = 0.0000818084     a =
 0.788786     a1 = 2.42118     t1 =0.00911816     t2 = 0.0219413
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 4.06272
  uM         -------------------------------------------------------
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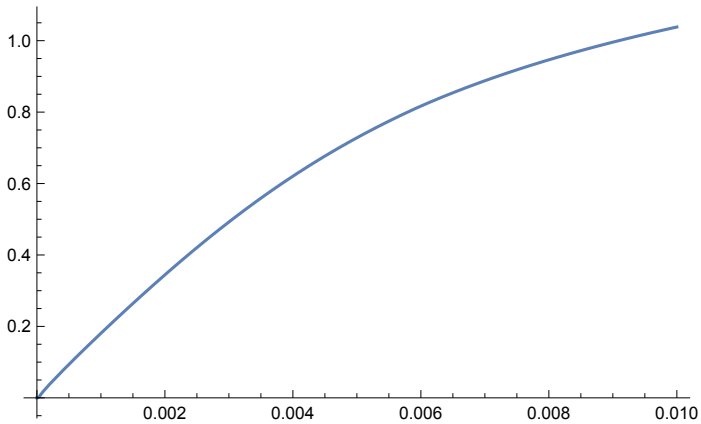


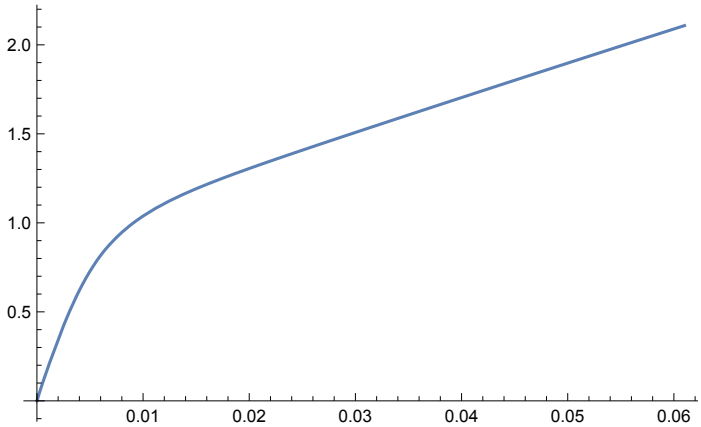


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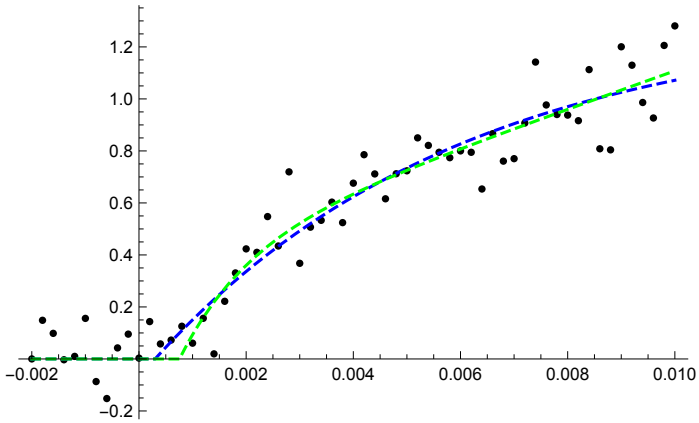


```
Mono: chi2 = 0.688203     d = 0.688203     a = 1.31499     t = 0.00575031

Bi: ratio chi2Mono/chi2Bi = 1.05615     d = 0.000757158
      a = 59.5537     a1 = 0.4249     t1 =0.00124715     t2 = 0.795278

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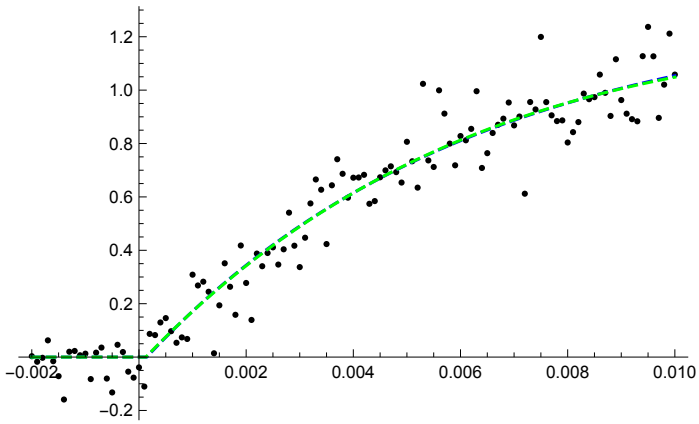


```
Mono: chi2 = 1.09088     d = 1.09088     a = 1.31867     t = 0.00613874
Bi: ratio chi2Mono/chi2Bi = 1.00209     d = 0.000128849     a =
 0.715615     a1 = 2.77921     t1 =0.00878736     t2 = 0.0192792
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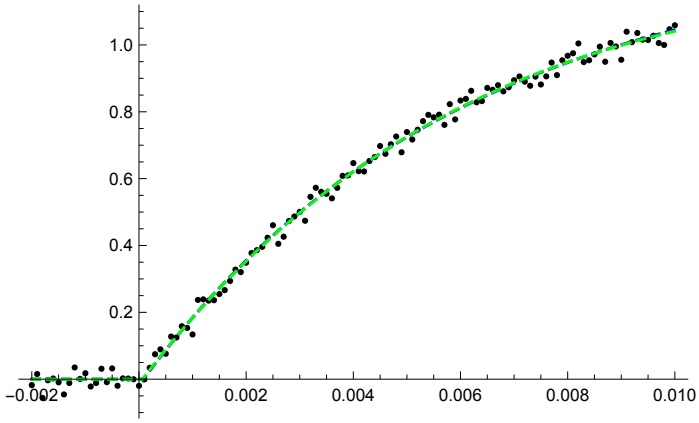
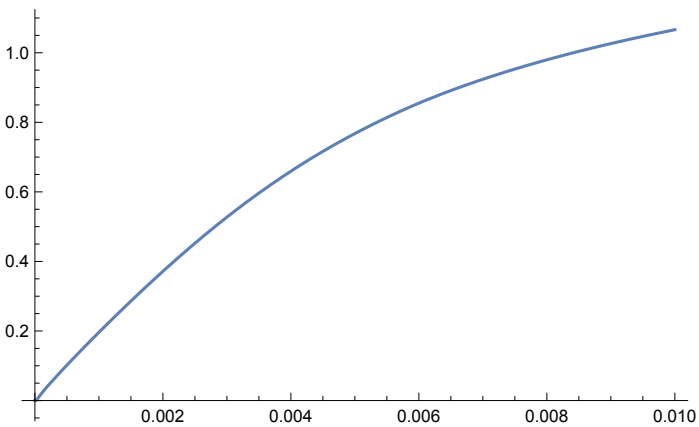
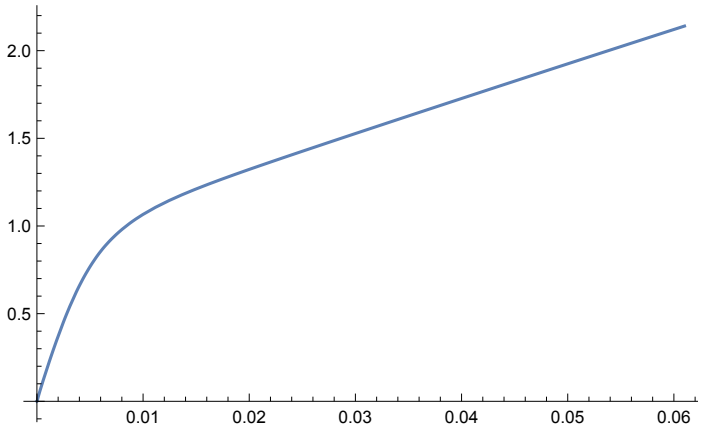



```
Mono: chi2 = 0.0536998     d = 0.0536998     a = 1.28851     t = 0.0059541
Bi: ratio chi2Mono/chi2Bi = 1.01579     d = 0.0000682151     a =
 0.87054     a1 = 2.07324     t1 =0.00765684     t2 = 0.0202902
------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 4.29254
  uM         -------------------------------------------------------
------------------------------------------------------------------------------------
  -------------------------
```



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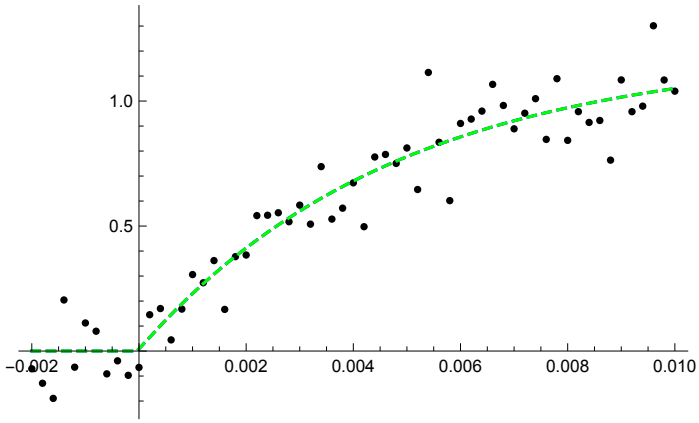


```
Mono: chi2 = 0.741104     d = 0.741104     a = 1.19933     t = 0.00480927
Bi: ratio chi2Mono/chi2Bi = 1.     d = -0.0000251194     a =
 1.19933     a1 = 0.764478     t1 =0.00480927     t2 = 0.00480927
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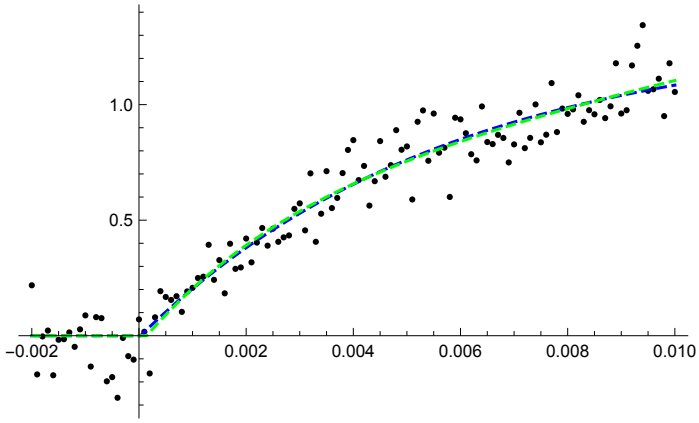


```
Mono: chi2 = 1.22504     d = 1.22504     a = 1.31978     t = 0.0057828
Bi: ratio chi2Mono/chi2Bi = 1.00843     d = 0.000145499     a =
 16.5551     a1 = 0.612851     t1 =0.00283772     t2 = 0.302812
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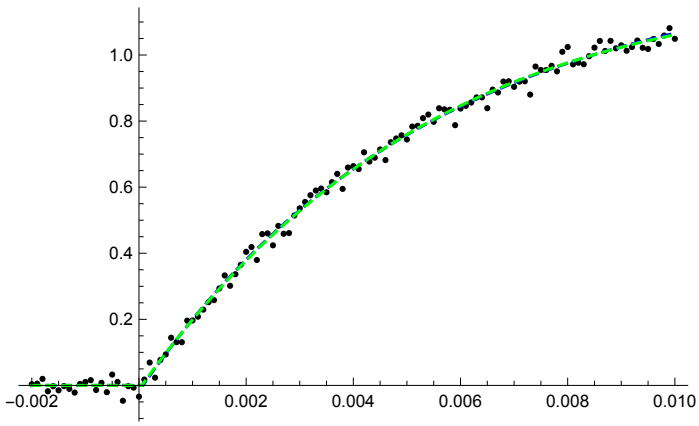
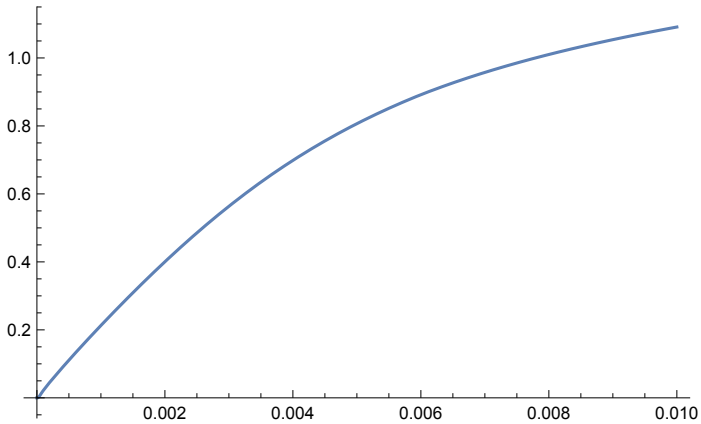
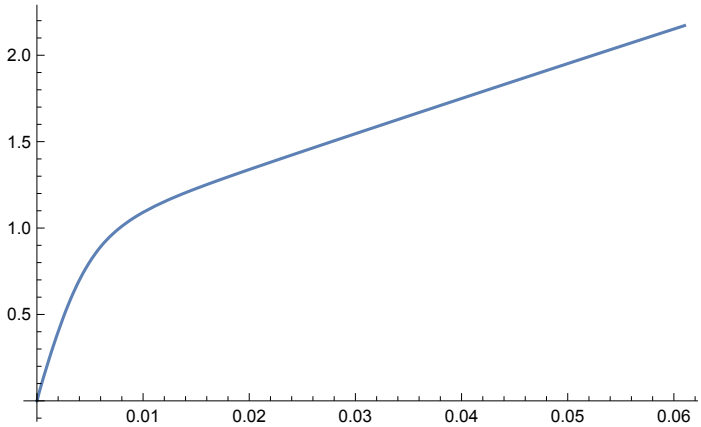


```
Mono: chi2 = 0.0481713     d = 0.0481713     a = 1.26719     t = 0.00539622
Bi: ratio chi2Mono/chi2Bi = 1.00775     d = 0.0000528356     a =
 0.86805     a1 = 2.3336     t1 =0.00734468     t2 = 0.0162774
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 4.53549
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```

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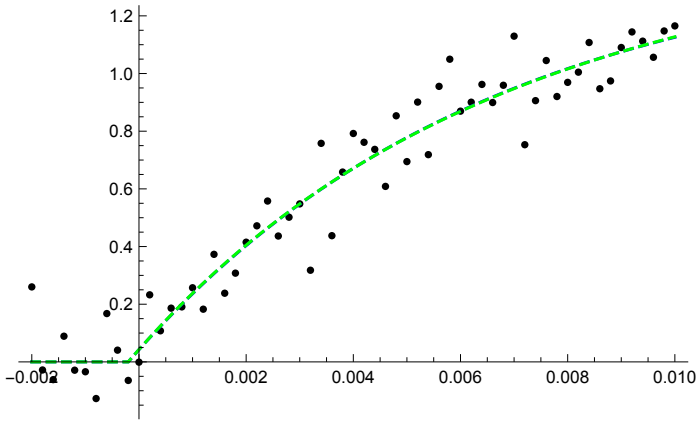


```
Mono: chi2 = 0.581761     d = 0.581761     a = 1.43801     t = 0.00667814

Bi: ratio chi2Mono/chi2Bi = 0.999043     d = -0.0002     a =
 2.89636     a1 = 1.28712     t1 =0.00617762     t2 = 0.183418

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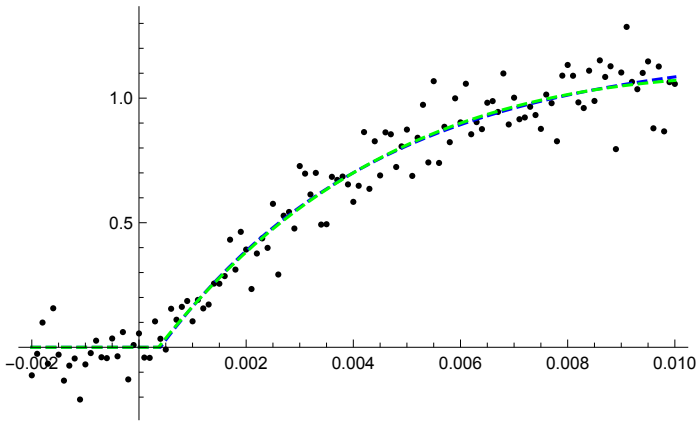


```
Mono: chi2 = 1.00321     d = 1.00321     a = 1.20211     t = 0.00412005
Bi: ratio chi2Mono/chi2Bi = 1.00983     d = 0.000365304     a =
 0.470647     a1 = 3.14074     t1 =0.00682054     t2 = 0.014364
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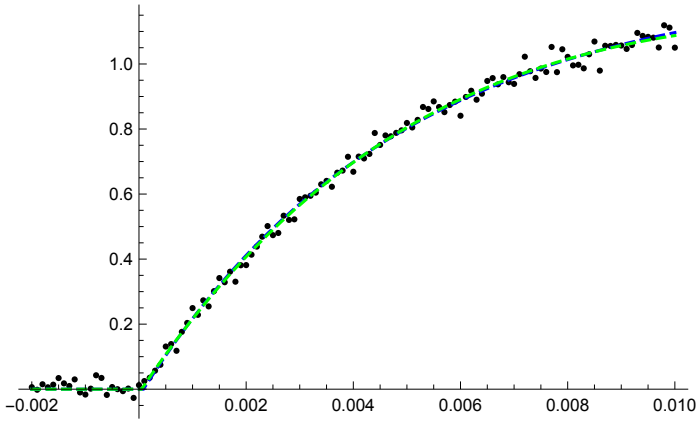


```
Mono: chi2 = 0.0562588     d = 0.0562588     a = 1.25907     t = 0.00484437
Bi: ratio chi2Mono/chi2Bi = 1.03489     d = 0.0000495541     a =
 0.576644     a1 = 3.12659     t1 =0.00768791     t2 = 0.0159721
------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 4.79194
  uM         -------------------------------------------------------
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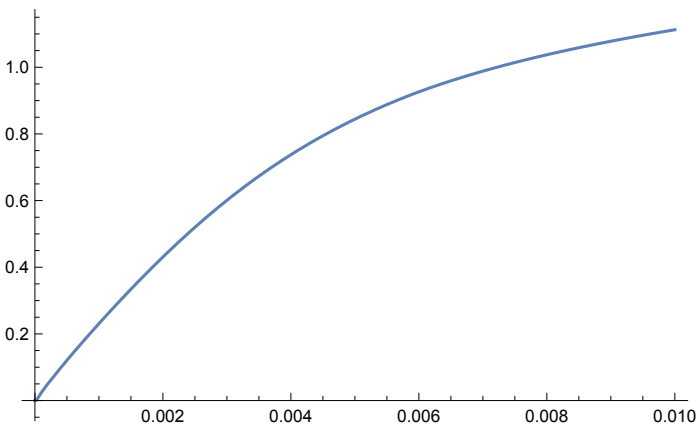

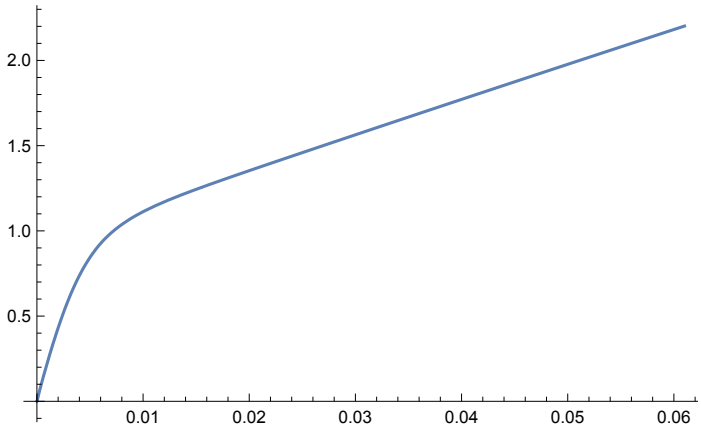


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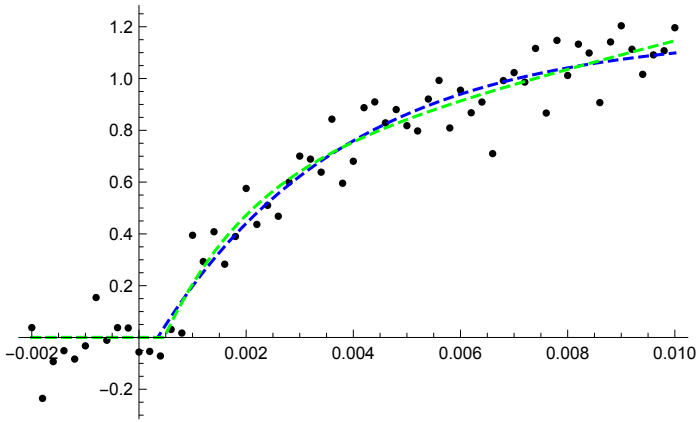


```
Mono: chi2 = 0.526459     d = 0.526459     a = 1.17314     t = 0.00350019
Bi: ratio chi2Mono/chi2Bi = 1.05083     d = 0.000471546     a =
 7.31476     a1 = 0.622415     t1 =0.00158251     t2 = 0.116659
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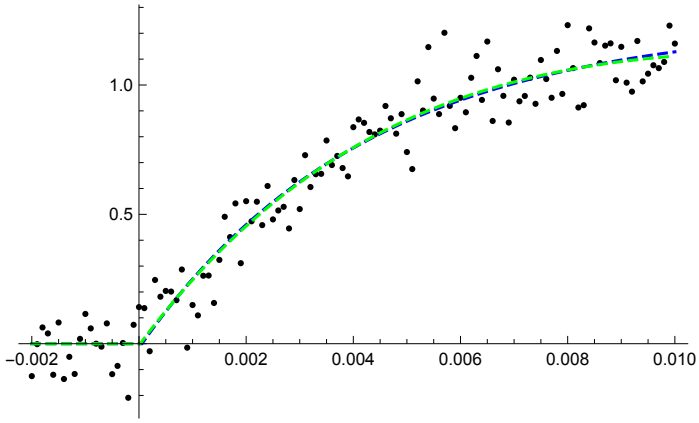


```
Mono: chi2 = 1.14165     d = 1.14165     a = 1.24623     t = 0.00422023
Bi: ratio chi2Mono/chi2Bi = 1.01319     d = 0.0000241319     a =
 0.488193     a1 = 3.43221     t1 =0.00708073     t2 = 0.0142567
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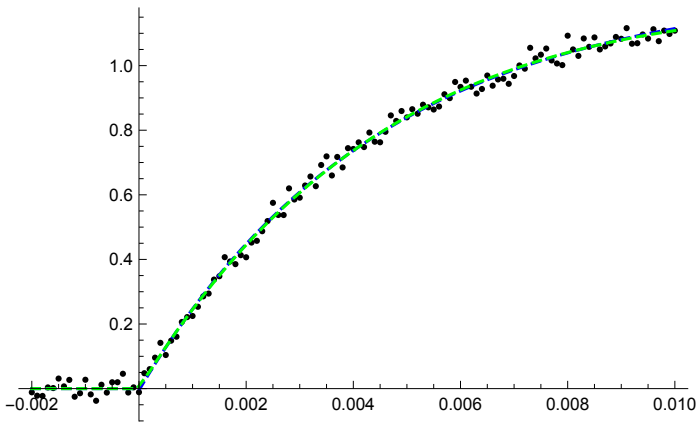

Mono: chi2 = 0.0562464  d = 0.0562464  a = 1.24749  t = 0.00445761

Bi: ratio chi2Mono/chi2Bi = 1.02044  d = $-1.54399 \times 10^{-17}$  a = 0.938768  a1 = 1.84672  t1 =0.00561602  t2 = 0.0157331

---

---  Ca = 5.70182

uM  ---

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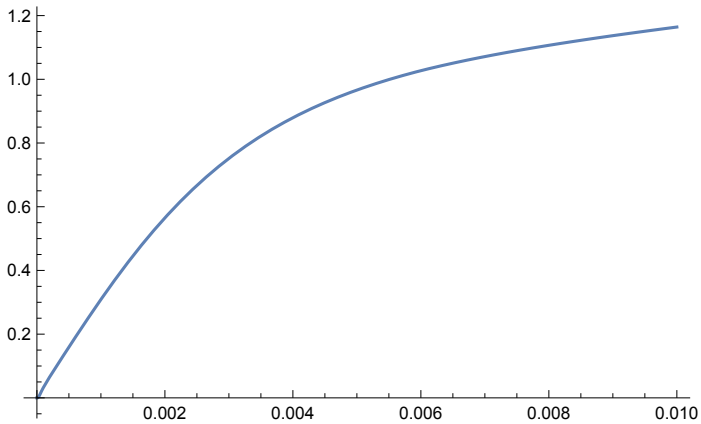


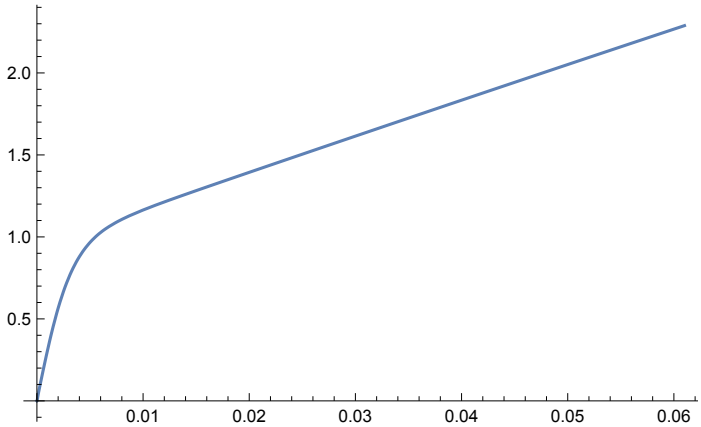


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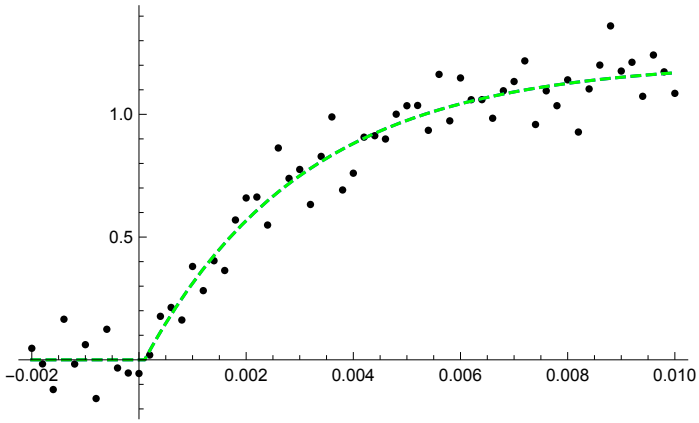


```
Mono: chi2 = 0.498848     d = 0.498848     a = 1.21436     t = 0.00301053

Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000106261     a =
 1.45204     a1 = 1.21001     t1 =0.00299886     t2 = 0.608173

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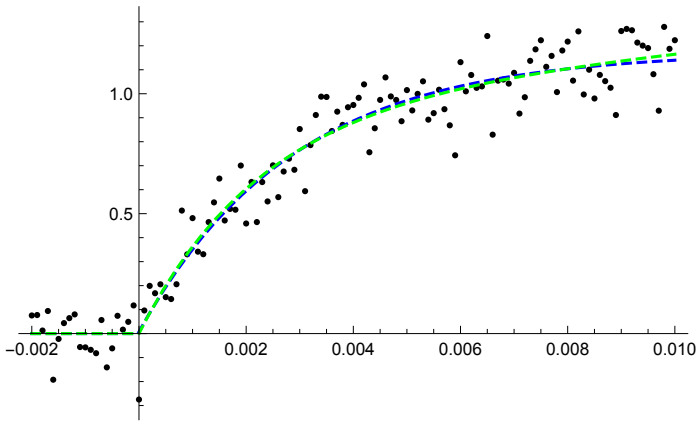


Mono: chi2 = 1.26191 d = 1.26191 a = 1.17499 t = 0.00285962

Bi: ratio chi2Mono/chi2Bi = 1.01099 d = $2.0824 \times 10^{-17}$ a = 3.6711 a1 = 0.946499 t1 =0.00225641 t2 = 0.113725

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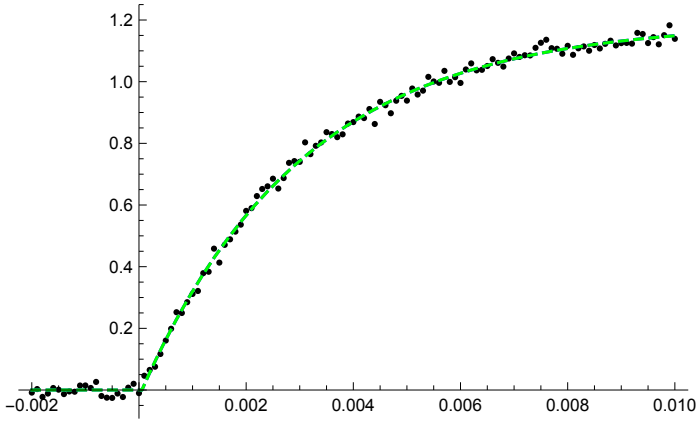
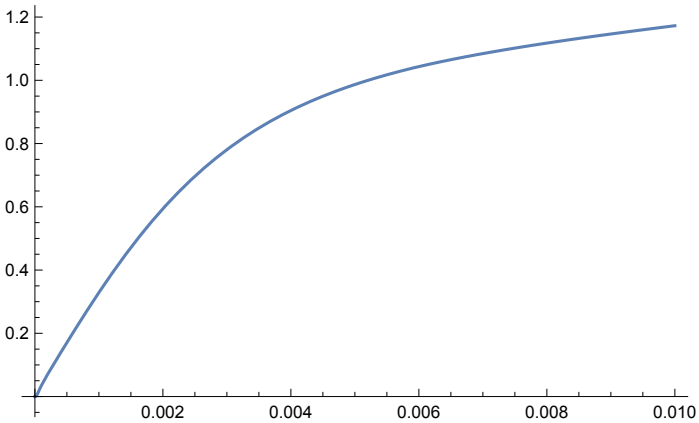
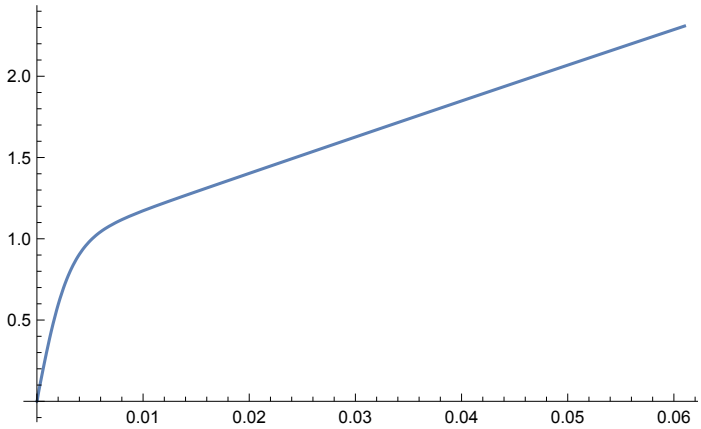



```
Mono: chi2 = 0.0360502     d = 0.0360502     a = 1.19367     t = 0.00301923
Bi: ratio chi2Mono/chi2Bi = 1.00014     d = 0.0000546885     a =
 1.19096     a1 = 1.39713     t1 =0.003122     t2 = 0.00386719
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 5.94854
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```



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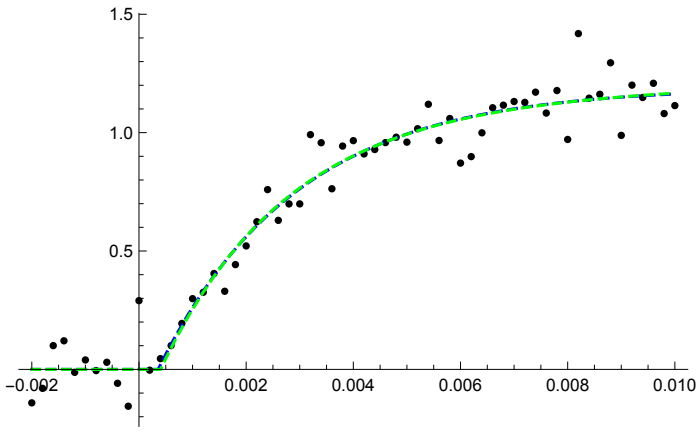


```
Mono: chi2 = 0.545866     d = 0.545866     a = 1.19172     t = 0.00258321
Bi: ratio chi2Mono/chi2Bi = 0.998653     d = 0.000404209     a =
 1.25092     a1 = 1.08419     t1 =0.00232322     t2 = 0.0104886
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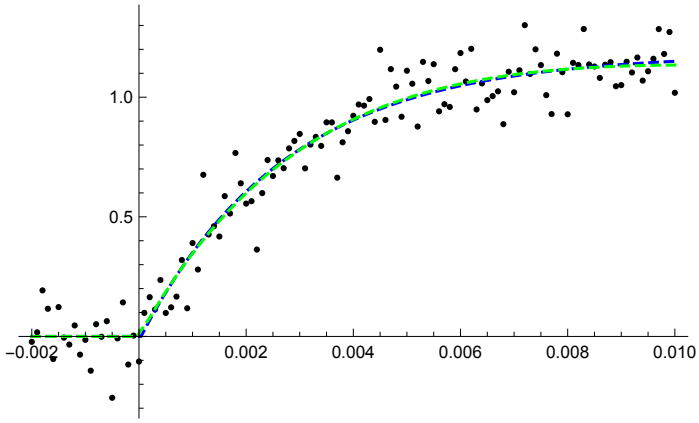


Mono: chi2 = 1.16976 d = 1.16976 a = 1.18058 t = 0.00272592

Bi: ratio chi2Mono/chi2Bi = 1.00517 d = $7.1988 \times 10^{-15}$ a = 1.00173 a1 = 1.97484 t1 =0.00372494 t2 = 0.00774349

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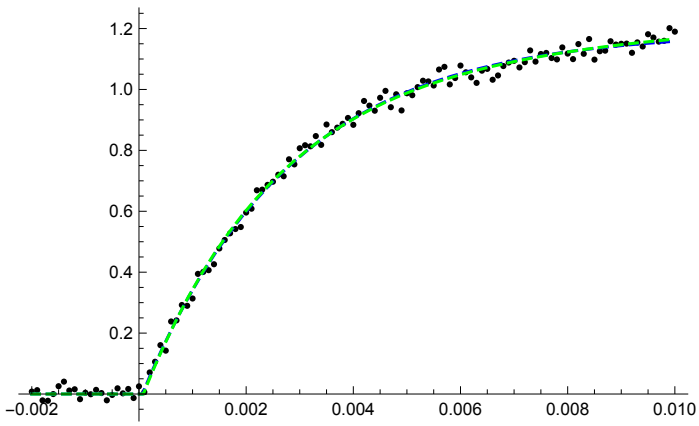
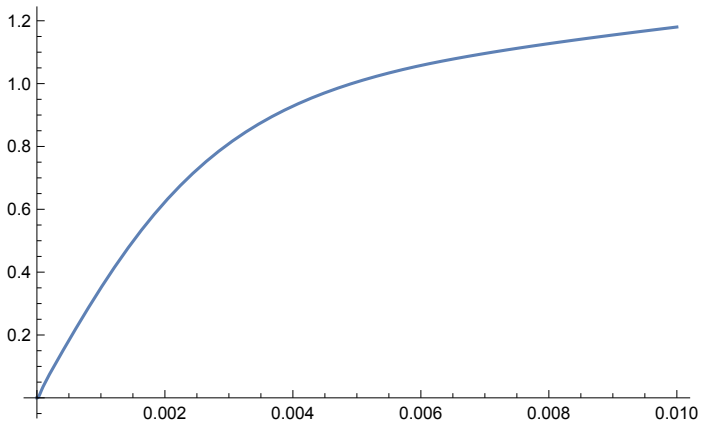
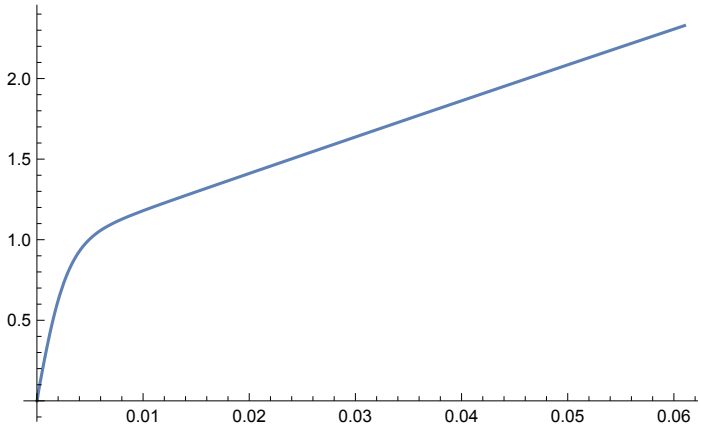


```
Mono: chi2 = 0.0499285     d = 0.0499285     a = 1.19085     t = 0.00276132
Bi: ratio chi2Mono/chi2Bi = 1.01879     d = 0.0000814217
      a = 3.63502     a1 = 1.11138     t1 =0.00254708     t2 = 0.32174
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 6.20769
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```

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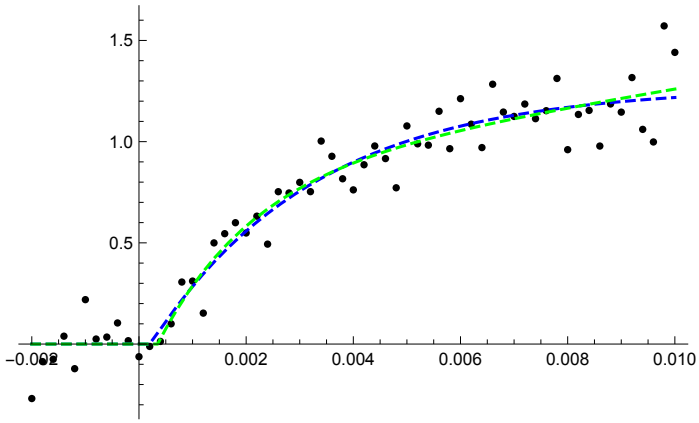


```
Mono: chi2 = 0.857667     d = 0.857667     a = 1.2711     t = 0.00307916

Bi: ratio chi2Mono/chi2Bi = 1.02413     d = 0.000350292     a =
 12.5482     a1 = 0.835768     t1 =0.00175885     t2 = 0.259608

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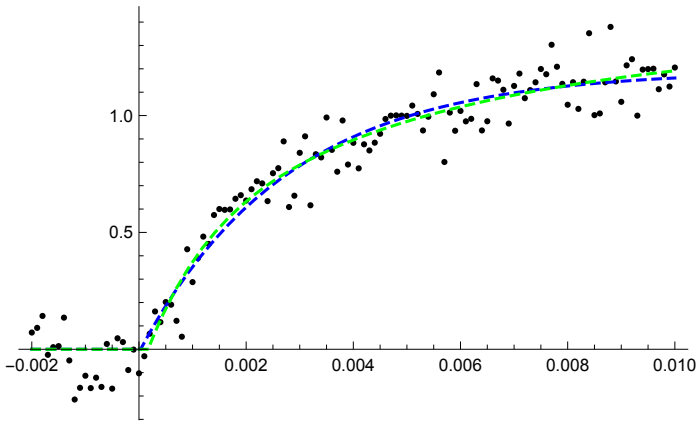


```
Mono: chi2 = 1.08494     d = 1.08494     a = 1.19318     t = 0.00276478
Bi: ratio chi2Mono/chi2Bi = 1.03633     d = 0.000171979     a =
 1.33476     a1 = 0.487726     t1 =0.00110928     t2 = 0.0055276
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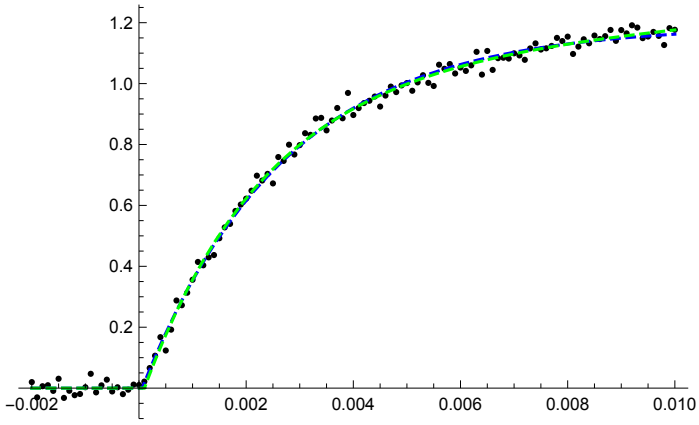


```
Mono: chi2 = 0.0590555     d = 0.0590555     a = 1.19061     t = 0.00266163
Bi: ratio chi2Mono/chi2Bi = 1.05641     d = 0.000102132
      a = 3.98528     a1 = 1.0482     t1 =0.00226185     t2 = 0.201041
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 6.48003
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
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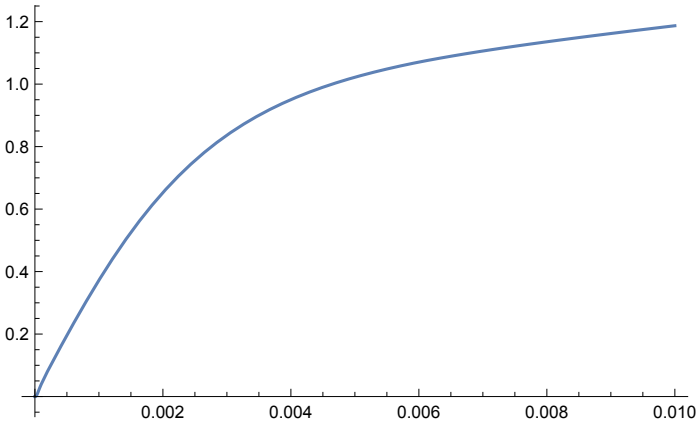
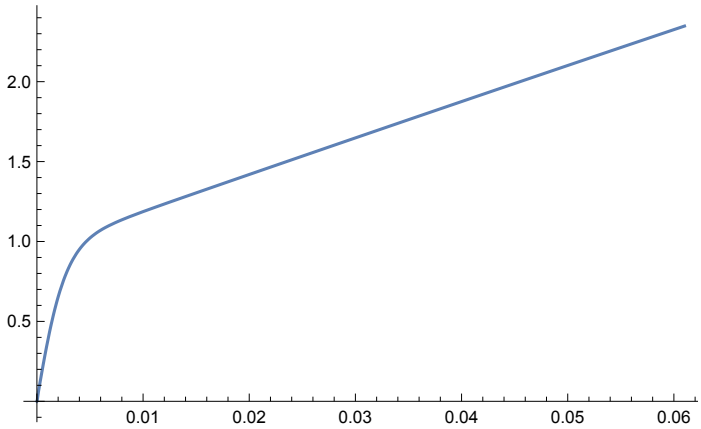
```



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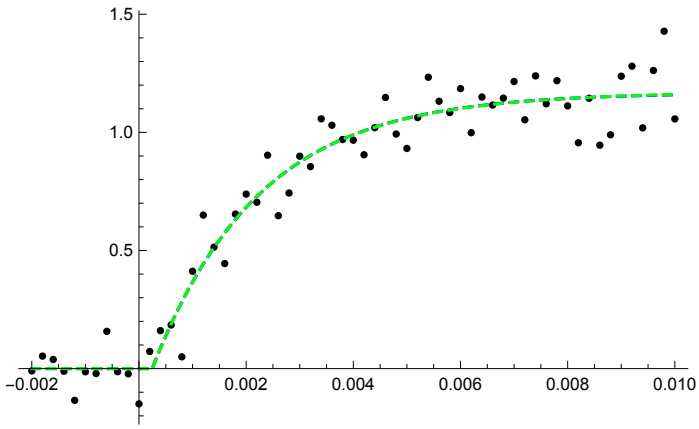


```
Mono: chi2 = 0.642769     d = 0.642769     a = 1.16758     t = 0.00199371
Bi: ratio chi2Mono/chi2Bi = 1.00004     d = 0.000250024     a =
 2.05752     a1 = 1.15718     t1 =0.00196799     t2 = 0.766204
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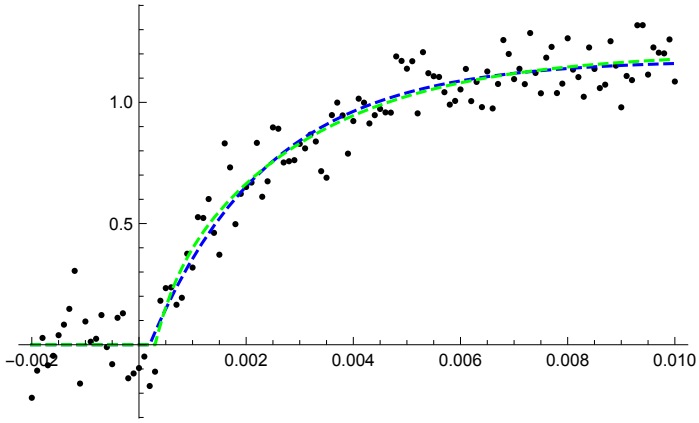


```
Mono: chi2 = 1.24762     d = 1.24762     a = 1.17449     t = 0.00221696
Bi: ratio chi2Mono/chi2Bi = 1.02818     d = 0.0003     a =
 1.20739     a1 = 0.206572     t1 =0.000384822     t2 = 0.00275803
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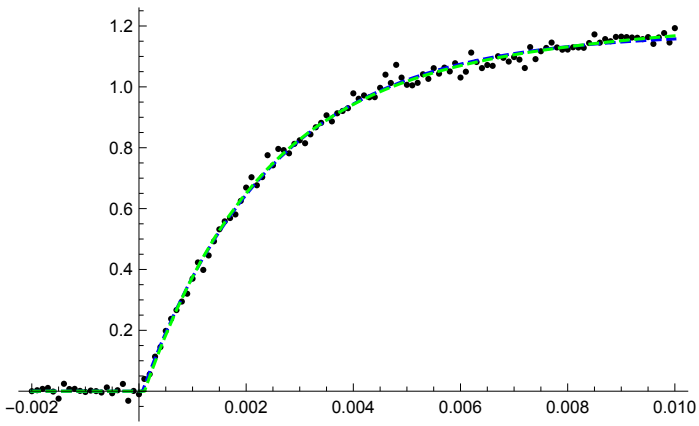

```
Mono: chi2 = 0.0410928     d = 0.0410928     a = 1.17723     t = 0.00243053
Bi: ratio chi2Mono/chi2Bi = 1.03206     d = 0.000103984
      a = 3.59558     a1 = 1.08254     t1 =0.00216088     t2 = 0.25322
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 6.76619
  uM         -------------------------------------------------------
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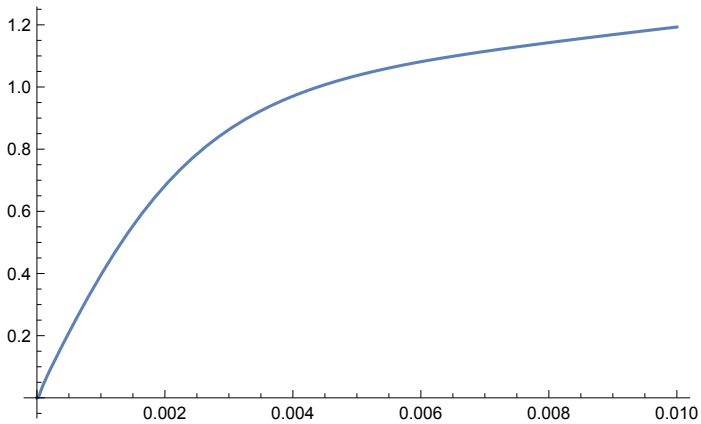


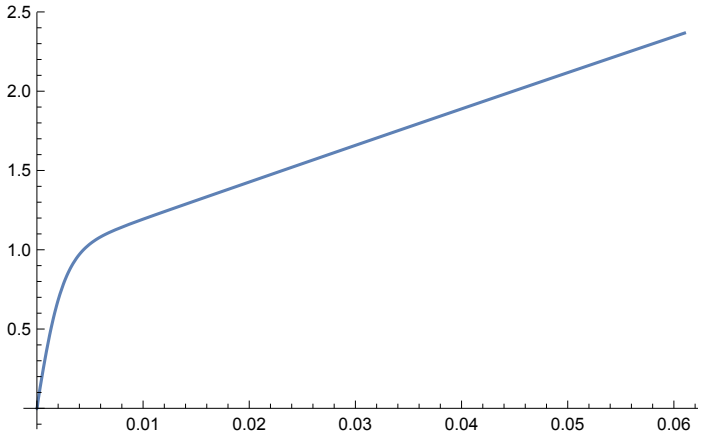


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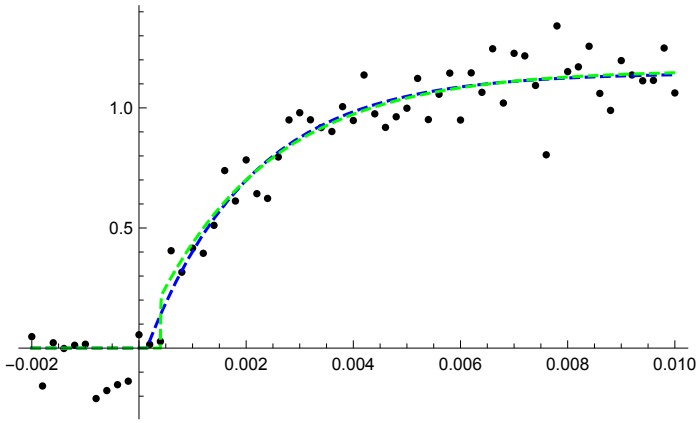


Mono: chi2 = 0.641333  d = 0.641333  a = 1.14557  t = 0.0019675

Bi: ratio chi2Mono/chi2Bi = 1.03539  d = 0.000399122  a = 1.15832  a1 = 0.211291  t1 = $6.33566 \times 10^{-6}$  t2 = 0.00220236

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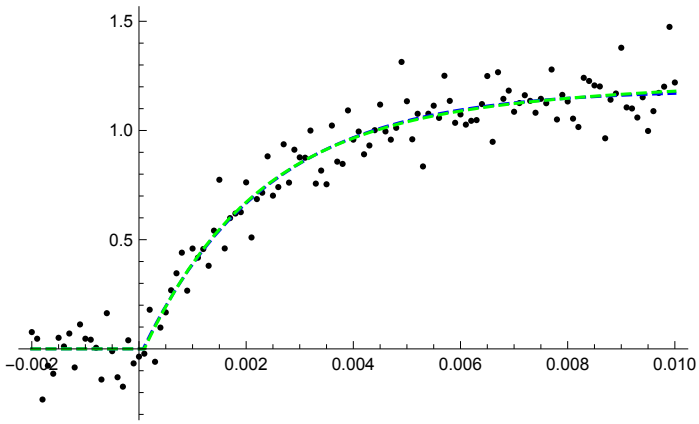


```
Mono: chi2 = 1.18399     d = 1.18399     a = 1.18666     t = 0.00232071
Bi: ratio chi2Mono/chi2Bi = 1.00148     d = 0.0001     a =
 2.0953     a1 = 1.10665     t1 =0.00211732     t2 = 0.111911
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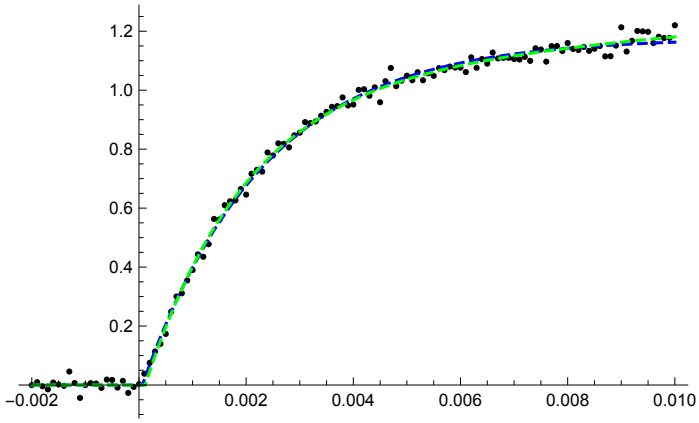


```
Mono: chi2 = 0.0509673     d = 0.0509673     a = 1.17736     t = 0.00226063
Bi: ratio chi2Mono/chi2Bi = 1.11973     d = 0.000116967     a =
 6.84069     a1 = 1.04747     t1 =0.00189838     t2 = 0.407164
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  --------------------------
----------------     Ca = 7.06711
  uM         -------------------------------------------------------
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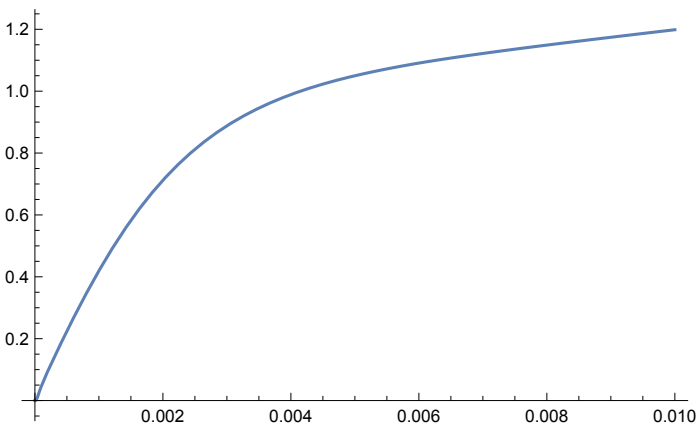
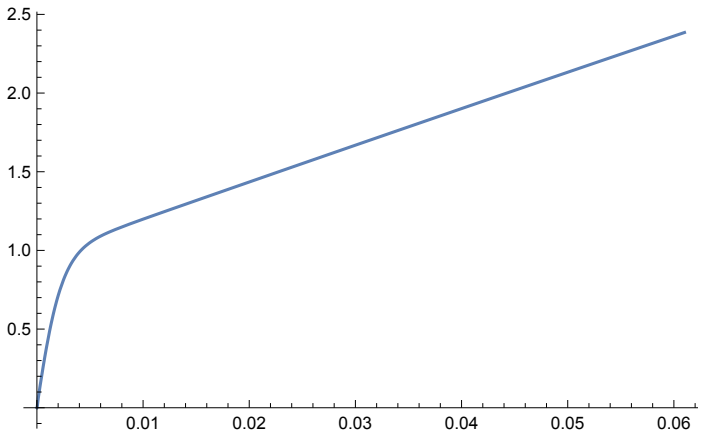
```






C5

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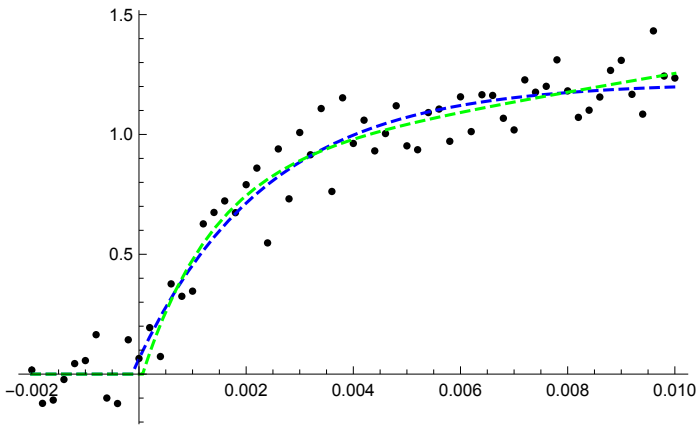


```
Mono: chi2 = 0.658074     d = 0.658074     a = 1.21648     t = 0.002409
Bi: ratio chi2Mono/chi2Bi = 1.0609     d = 0.0000687879
      a = 11.51     a1 = 0.867954     t1 =0.00131286     t2 = 0.267968
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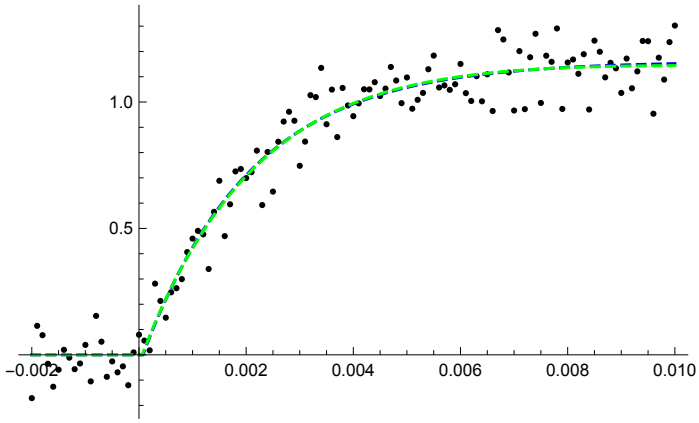


```
Mono: chi2 = 0.922466     d = 0.922466     a = 1.1604     t = 0.00203117
Bi: ratio chi2Mono/chi2Bi = 1.00135     d = 0.000060322     a =
 1.11159     a1 = 1.265     t1 =0.00220731     t2 = 0.00829954
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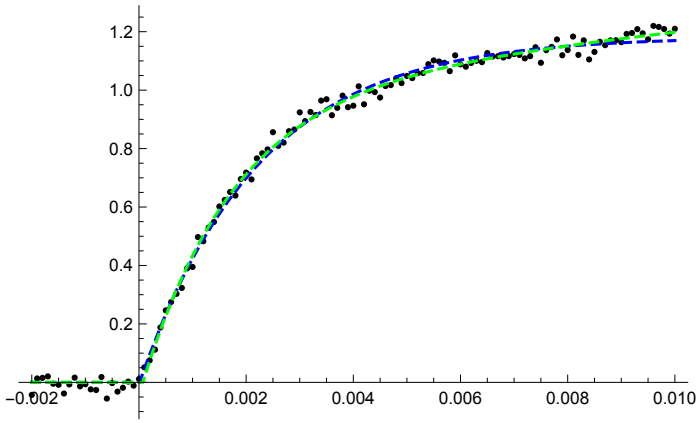


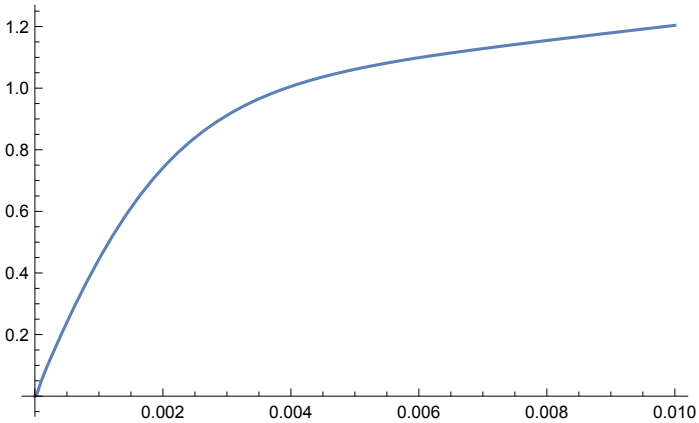

Mono: chi2 = 0.0732203  d = 0.0732203  a = 1.18274  t = 0.00222136

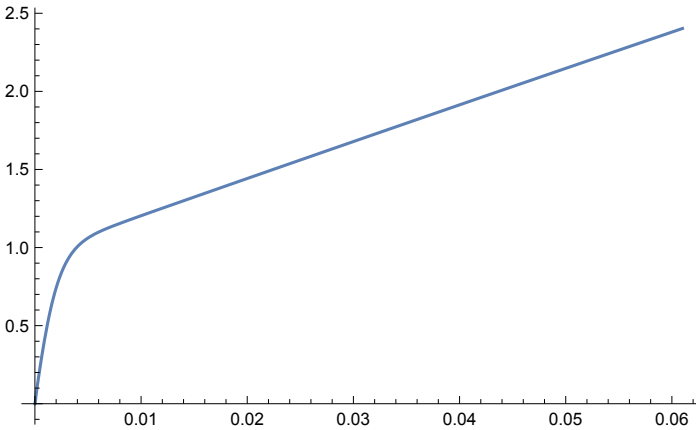
Bi: ratio chi2Mono/chi2Bi = 1.2873  d = 0.0000727657
  a = 6.00752  a1 = 1.00048  t1 =0.00172736  t2 = 0.24252

---

---  Ca = 7.38317
uM  ---

---




--- C5

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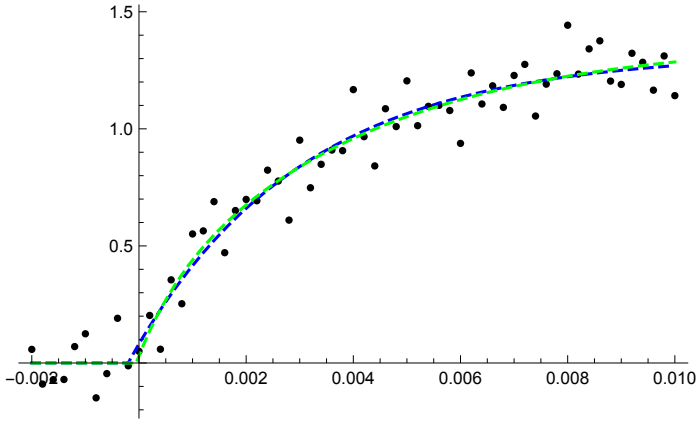


```
Mono: chi2 = 0.597856     d = 0.597856     a = 1.32341     t = 0.00318417
Bi: ratio chi2Mono/chi2Bi = 1.01734     d = -0.0000510607     a =
 1.37925     a1 = 0.224613     t1 =0.000709678     t2 = 0.00400252
------------------------------------------------------------------------ C10
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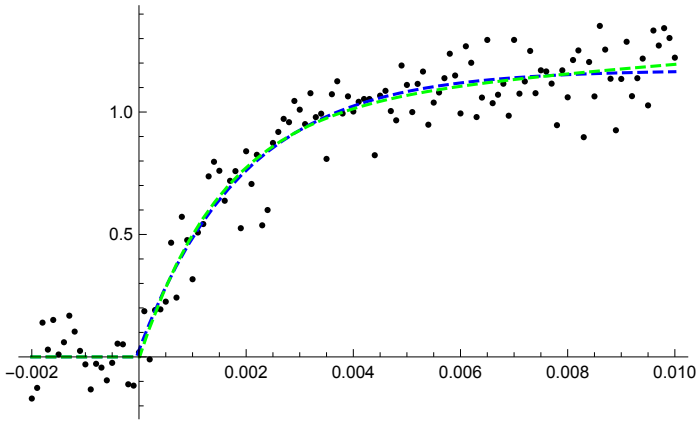


```
Mono: chi2 = 1.40963     d = 1.40963     a = 1.17142     t = 0.00194697

Bi: ratio chi2Mono/chi2Bi = 1.01322     d = 0.00001259     a =
 6.72901     a1 = 1.01996     t1 =0.00154729     t2 = 0.31825

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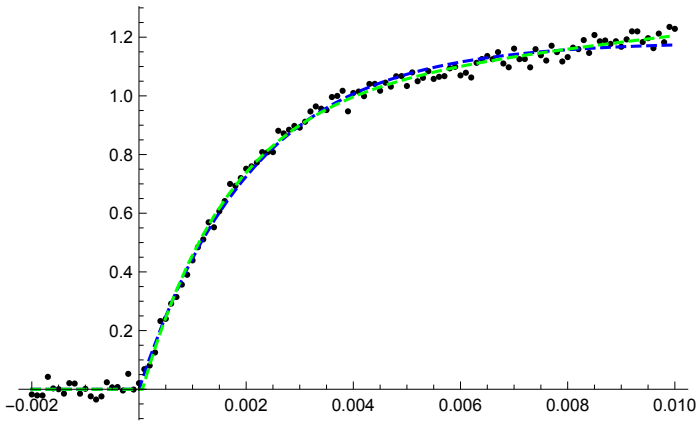


```
Mono: chi2 = 0.0753711     d = 0.0753711     a = 1.18378     t = 0.0021044
Bi: ratio chi2Mono/chi2Bi = 1.37242     d = 0.0000653541     a =
 7.44651     a1 = 1.00454     t1 =0.00162477     t2 = 0.310776
--------------------------------------------------------------------------------
  -------------------------
```

---------- Ca = 7.71513
uM ----------

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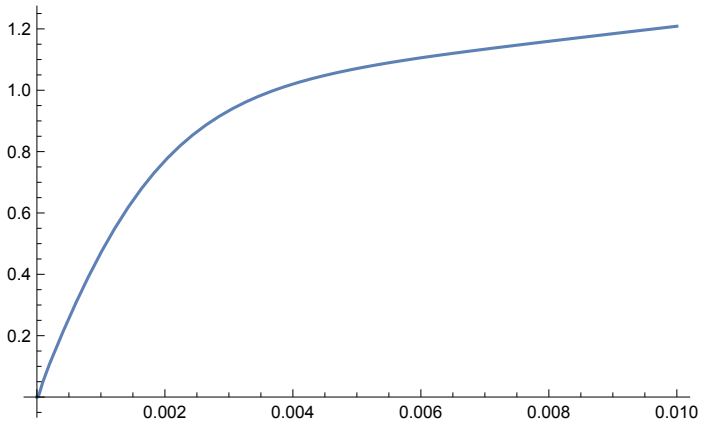


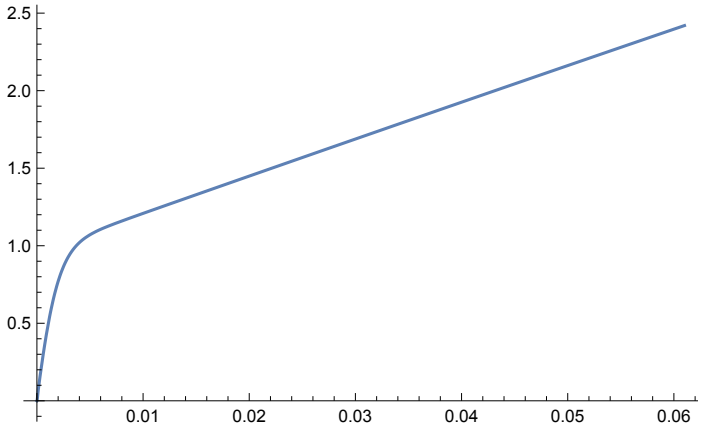


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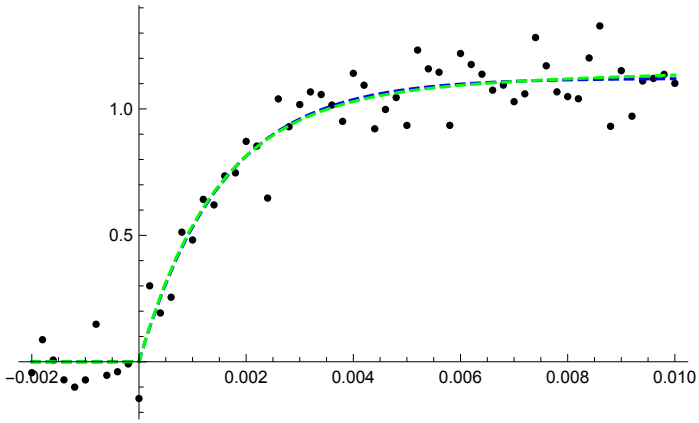


Mono: chi2 = 0.524761  d = 0.524761  a = 1.12126  t = 0.00154553

Bi: ratio chi2Mono/chi2Bi = 0.987511  d = $-1.66872 \times 10^{-17}$

a = 1.3365  a1 = 1.06793  t1 =0.00145035  t2 = 0.0348205

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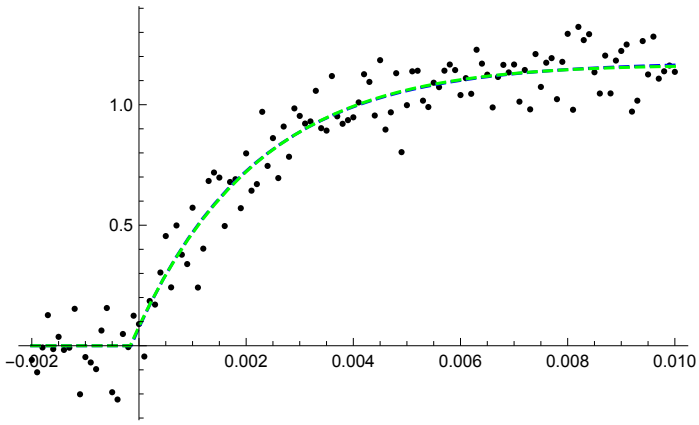


```
Mono: chi2 = 1.20602     d = 1.20602     a = 1.1772     t = 0.00224618
Bi: ratio chi2Mono/chi2Bi = 1.00066     d = -0.000162343     a =
 1.15801     a1 = 3.50942     t1 =0.00280417     t2 = 0.00316442
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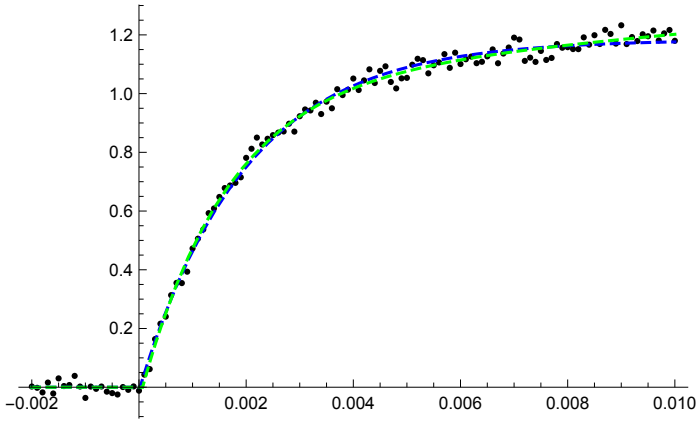


```
Mono: chi2 = 0.0713852     d = 0.0713852     a = 1.18359     t = 0.00196944
Bi: ratio chi2Mono/chi2Bi = 1.22633     d = 0.000068281     a =
 4.65724     a1 = 1.04497     t1 =0.00161173     t2 = 0.220428
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----------------     Ca = 8.06387
  uM          -------------------------------------------------------
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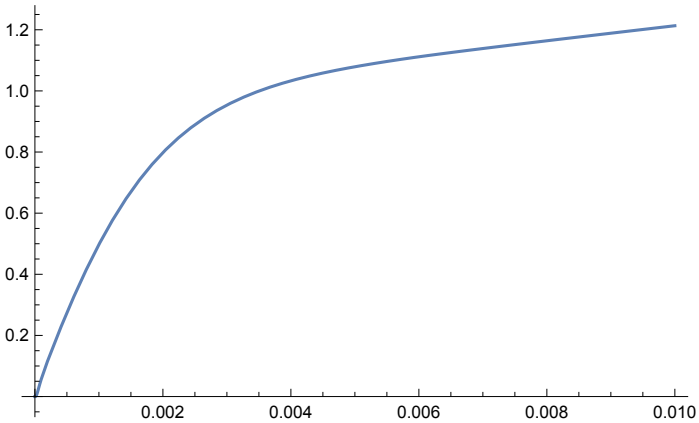

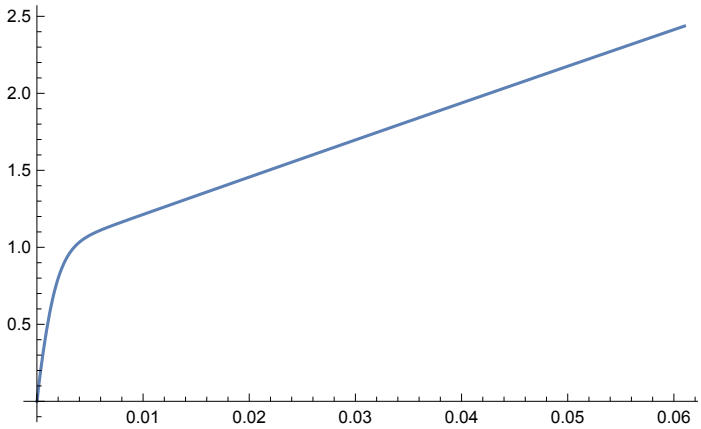


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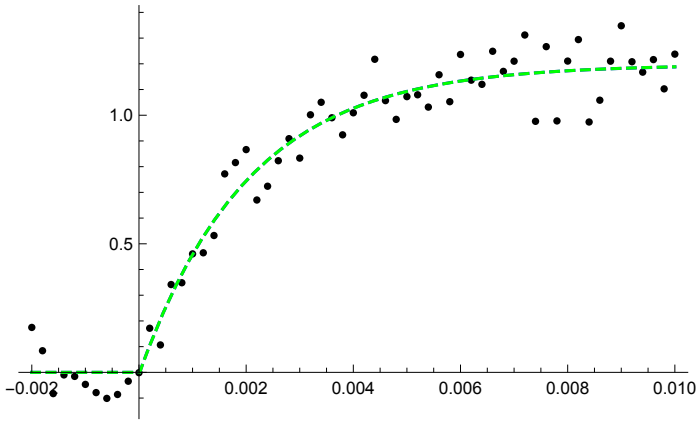


```
Mono: chi2 = 0.483034     d = 0.483034     a = 1.19687     t = 0.00204135
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.0000143823     a =
 1.47541     a1 = 1.19345     t1 =0.00203275     t2 = 0.751852
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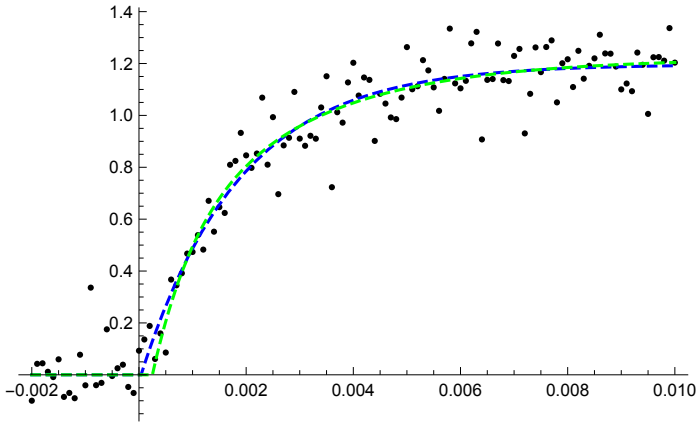


```
Mono: chi2 = 1.15819     d = 1.15819     a = 1.19667     t = 0.00183375
Bi: ratio chi2Mono/chi2Bi = 0.99961     d = 0.000251069     a =
 1.22061     a1 = 0.502361     t1 =0.000762309     t2 = 0.00258793
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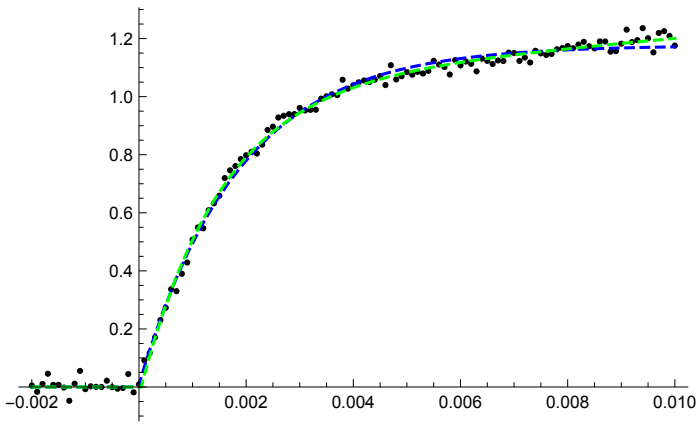

```
Mono: chi2 = 0.0669803     d = 0.0669803     a = 1.17666     t = 0.00184816
Bi: ratio chi2Mono/chi2Bi = 1.35931     d = 0.0000426834
      a = 5.71678     a1 = 1.0387     t1 =0.00149219     t2 = 0.280394
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----------------     Ca = 8.43035
  uM         -------------------------------------------------------
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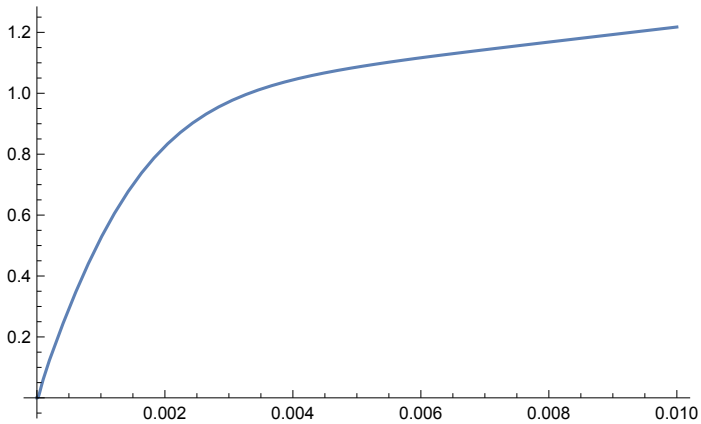


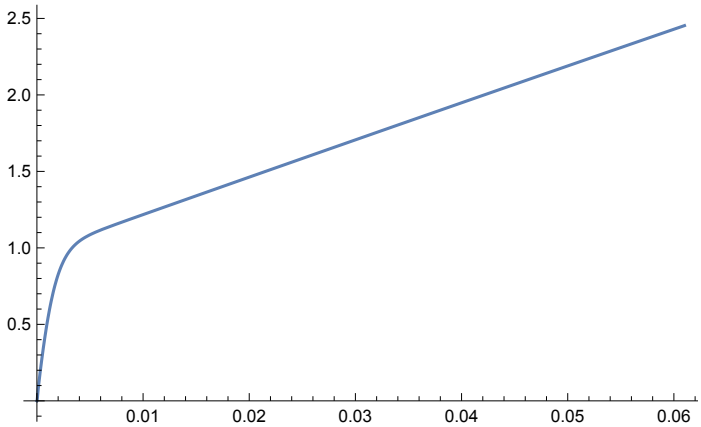


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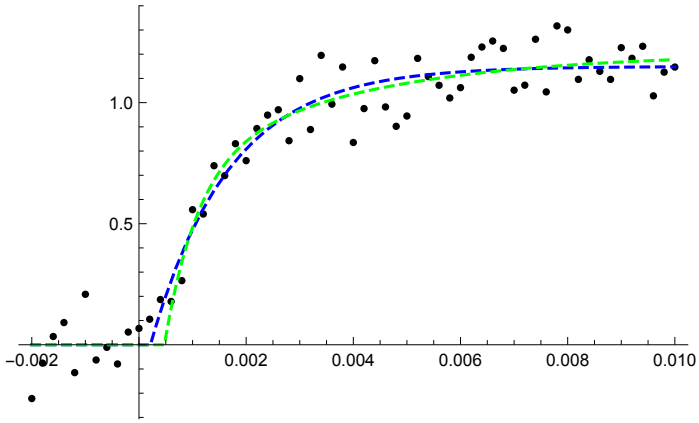


```
Mono: chi2 = 0.617137     d = 0.617137     a = 1.1494     t = 0.00146797

Bi: ratio chi2Mono/chi2Bi = 1.01131     d = 0.000474816     a =
 1.20616     a1 = 0.728805     t1 =0.000620485     t2 = 0.00338324

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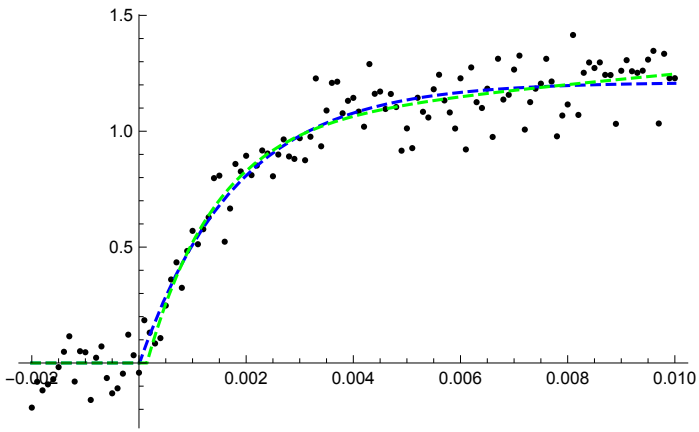


```
Mono: chi2 = 1.22277     d = 1.22277     a = 1.2115     t = 0.00180465
Bi: ratio chi2Mono/chi2Bi = 1.02502     d = 0.000148484
      a = 8.0301     a1 = 1.02711     t1 =0.00127379     t2 = 0.308181
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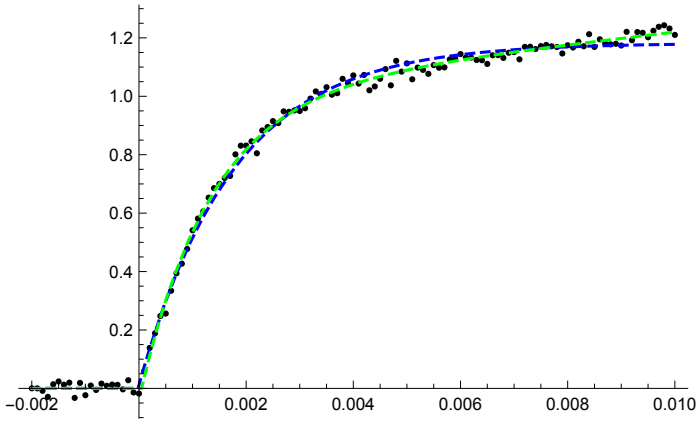


```
Mono: chi2 = 0.0778184     d = 0.0778184     a = 1.18184     t = 0.00177006
Bi: ratio chi2Mono/chi2Bi = 1.94631     d = 0.0000491092     a =
 5.69764     a1 = 1.00412     t1 =0.00131897     t2 = 0.210941
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  --------------------------
----------------     Ca = 8.8155
  uM         -------------------------------------------------------
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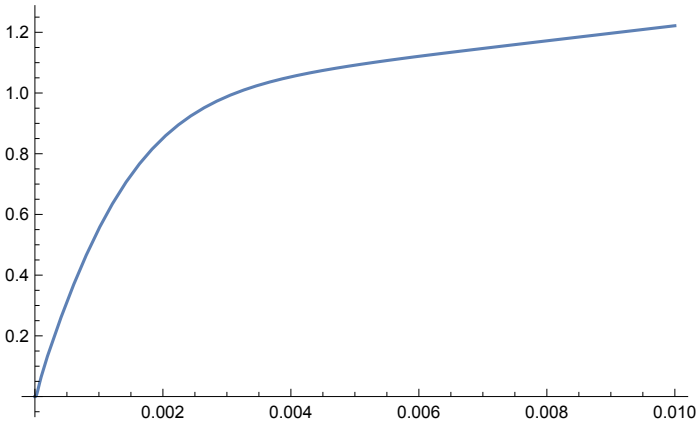

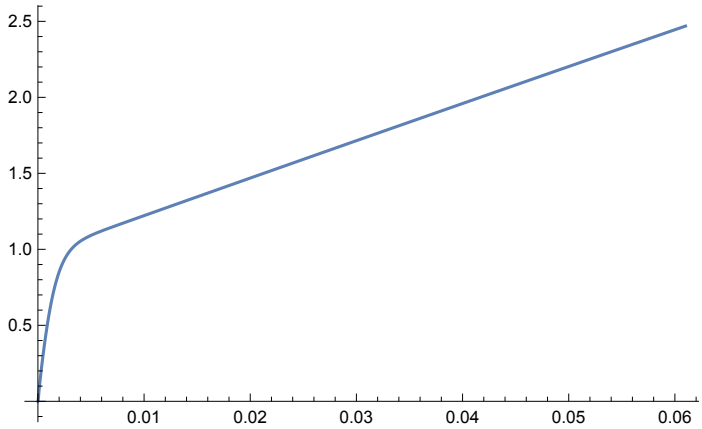


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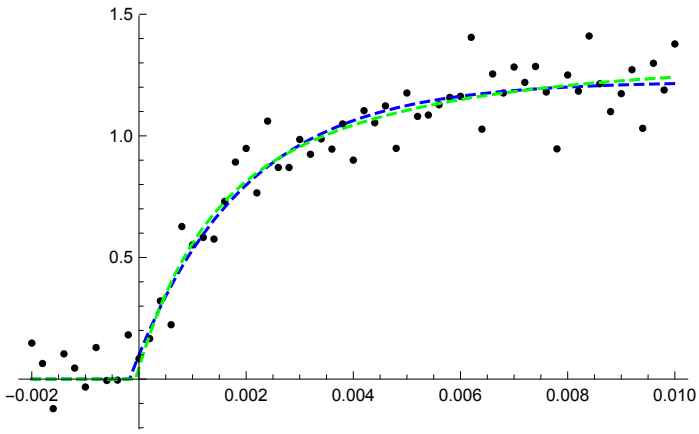


```
Mono: chi2 = 0.6266     d = 0.6266     a = 1.22362     t = 0.00205626
Bi: ratio chi2Mono/chi2Bi = 1.02735     d = -0.0000620728     a =
 1.29301     a1 = 0.636164     t1 =0.00105117     t2 = 0.00395712
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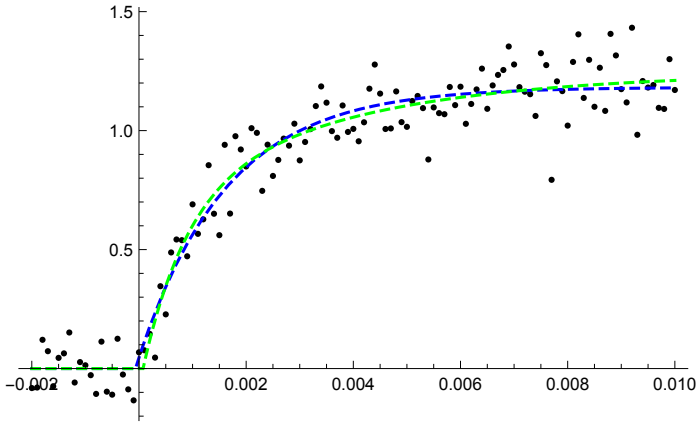


```
Mono: chi2 = 1.38625     d = 1.38625     a = 1.18207     t = 0.0016393
Bi: ratio chi2Mono/chi2Bi = 1.0384     d = 0.0000765882     a =
 1.24549     a1 = 0.6976     t1 =0.000803836     t2 = 0.00359309
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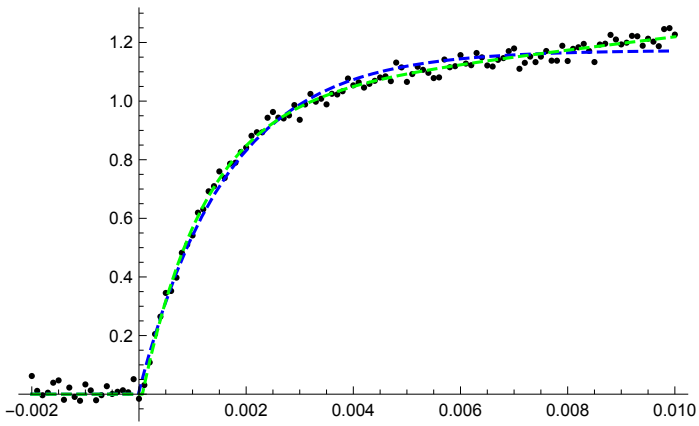

```
Mono: chi2 = 0.10683     d = 0.10683     a = 1.1736     t = 0.00162955
Bi: ratio chi2Mono/chi2Bi = 1.91826     d = 0.0000639629     a =
 6.37354     a1 = 0.994344     t1 =0.00117523     t2 = 0.232235
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 9.22041
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
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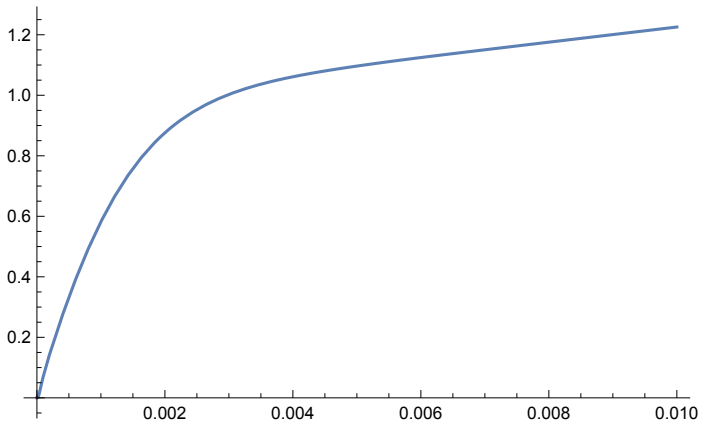


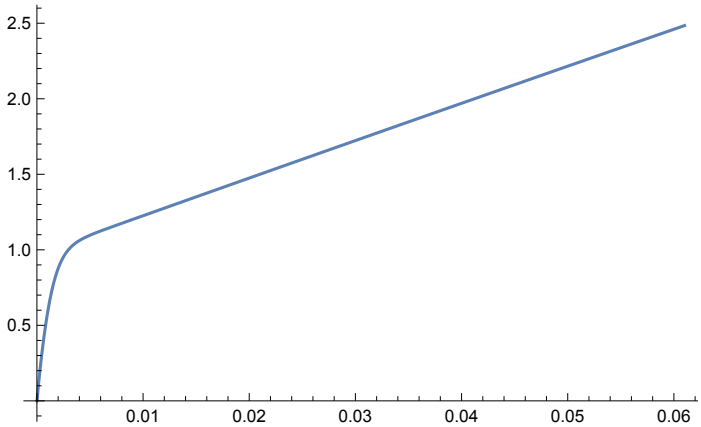


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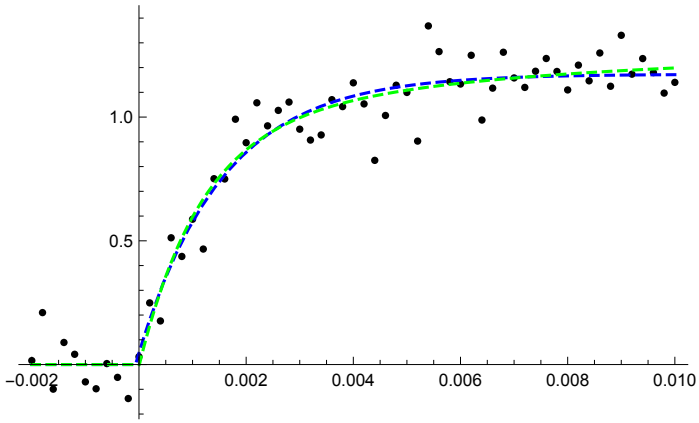


Mono: chi2 = 0.599123  d = 0.599123  a = 1.17327  t = 0.00157073

Bi: ratio chi2Mono/chi2Bi = 1.01946  d = $7.51287 \times 10^{-6}$  a = 1.25561  a1 = 0.932147  t1 =0.00112802  t2 = 0.00575472

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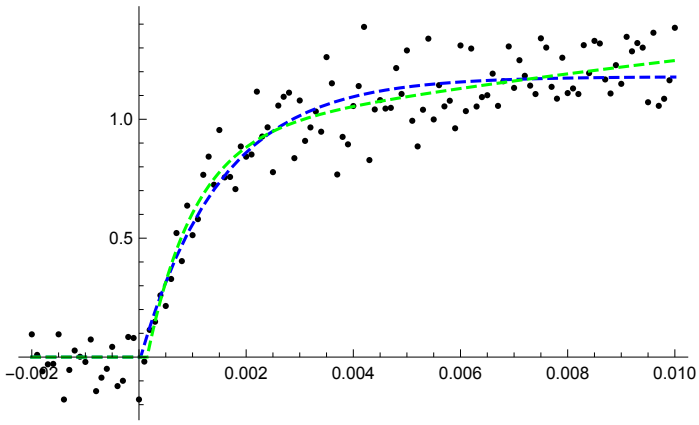


```
Mono: chi2 = 1.58715     d = 1.58715     a = 1.17913     t = 0.00150319
Bi: ratio chi2Mono/chi2Bi = 1.09005     d = 0.000152222     a =
 1.9392     a1 = 0.924186     t1 =0.000877341     t2 = 0.0257248
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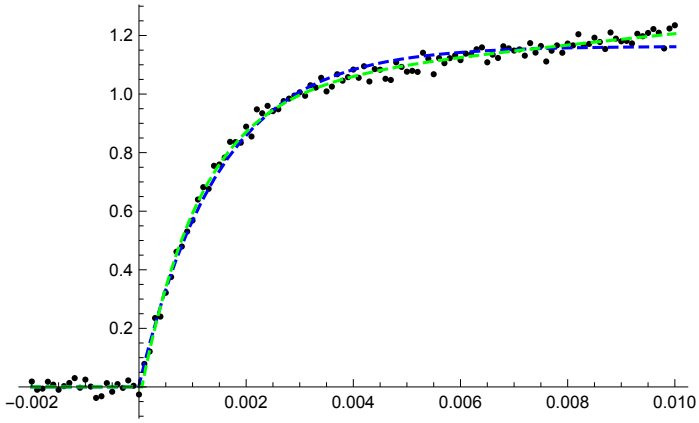


```
Mono: chi2 = 0.0915508     d = 0.0915508     a = 1.16299     t = 0.00149293
Bi: ratio chi2Mono/chi2Bi = 1.90922     d = 0.000053389     a =
 5.88418     a1 = 1.01424     t1 =0.00113393     t2 = 0.247198
------------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 9.64607
  uM         -------------------------------------------------------
------------------------------------------------------------------------------------------
  --------------------------
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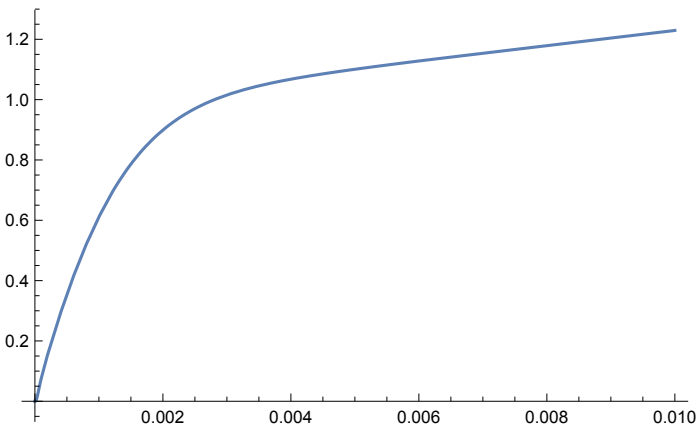

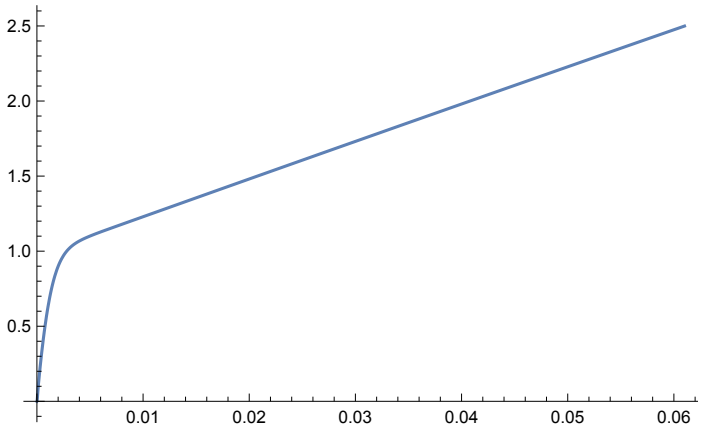


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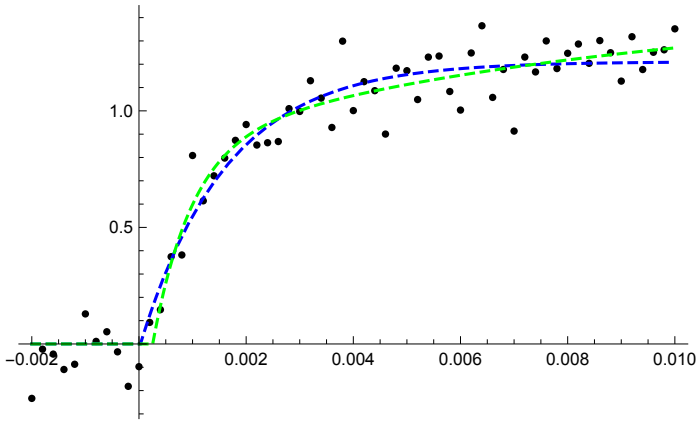


```
Mono: chi2 = 0.672277     d = 0.672277     a = 1.21079     t = 0.00161045
Bi: ratio chi2Mono/chi2Bi = 1.09172     d = 0.000256406     a =
 1.46361     a1 = 0.851398     t1 =0.00072406     t2 = 0.00846151
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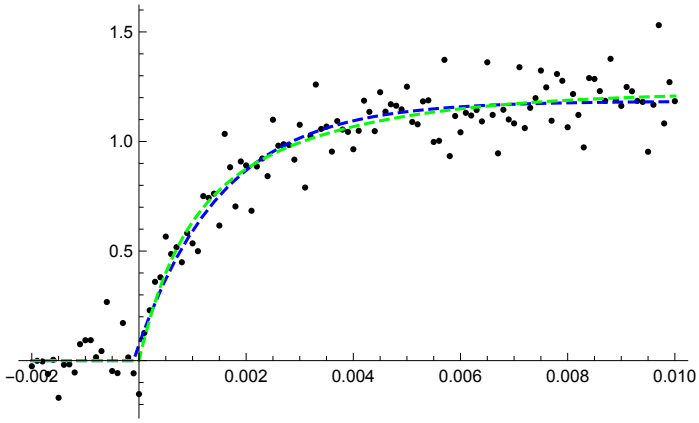


Mono: chi2 = 1.39324 d = 1.39324 a = 1.18349 t = 0.00158479

Bi: ratio chi2Mono/chi2Bi = 1.03269 d = $6.15269 \times 10^{-17}$ a = 1.22591 a1 = 0.580063 t1 =0.000702778 t2 = 0.00281462

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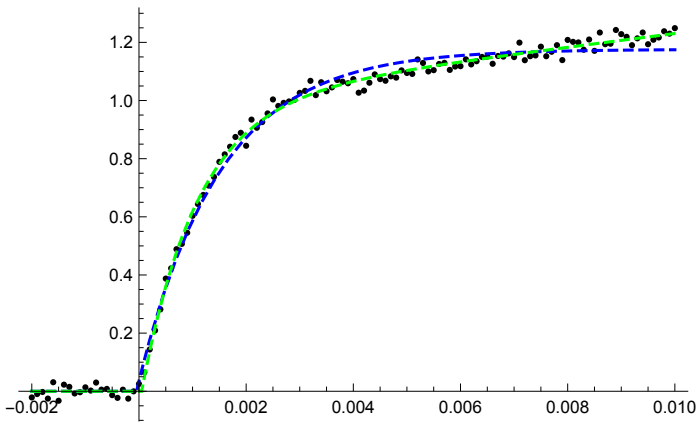

```
Mono: chi2 = 0.117211     d = 0.117211     a = 1.17612     t = 0.00150958
Bi: ratio chi2Mono/chi2Bi = 2.65841     d = 0.0000498619     a =
 6.09168     a1 = 0.991181     t1 =0.00103679     t2 = 0.206912
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----------------     Ca = 10.0938
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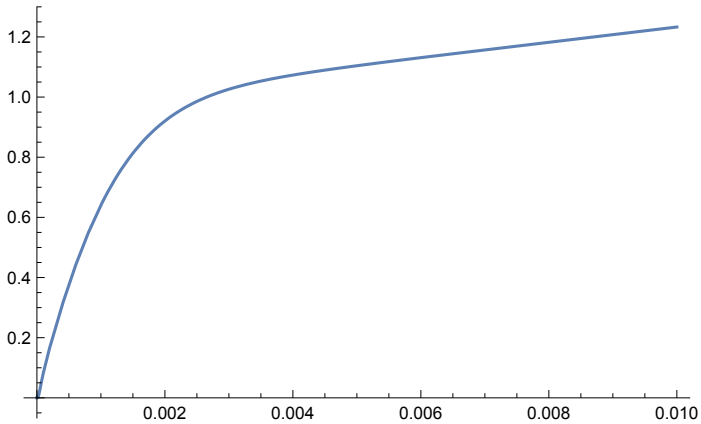


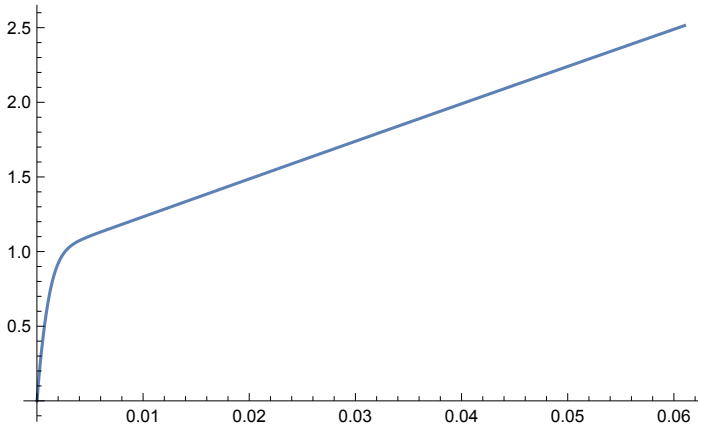


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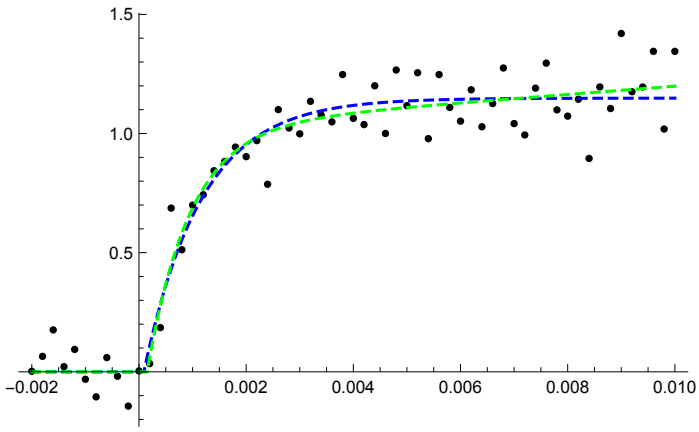


```
Mono: chi2 = 0.705236     d = 0.705236     a = 1.14848     t = 0.00107607

Bi: ratio chi2Mono/chi2Bi = 1.046     d = 0.000152527     a =
 6.32951     a1 = 1.02514     t1 =0.000795843     t2 = 0.295985

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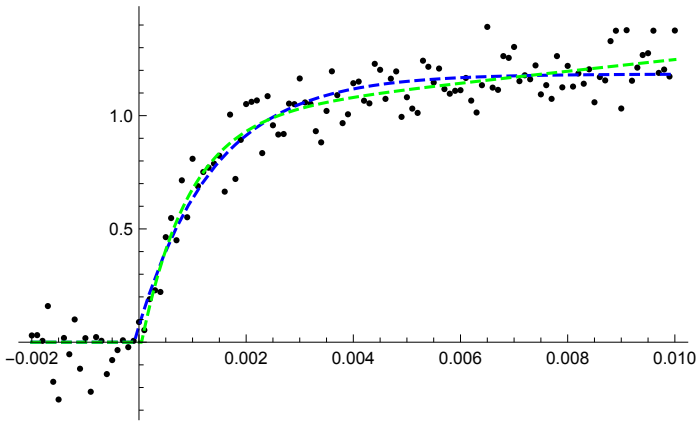


```
Mono: chi2 = 1.13281     d = 1.13281     a = 1.1835     t = 0.00141298
Bi: ratio chi2Mono/chi2Bi = 1.09498     d = 0.0000486081     a =
 6.78782     a1 = 0.986357     t1 =0.000882624     t2 = 0.215981
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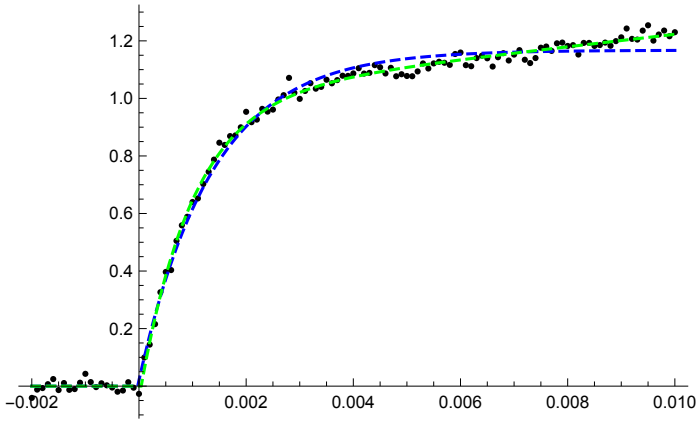


```
Mono: chi2 = 0.117848     d = 0.117848     a = 1.16751     t = 0.00136553
Bi: ratio chi2Mono/chi2Bi = 2.68931     d = 0.000042109     a =
 6.87195     a1 = 1.00436     t1 =0.000983028     t2 = 0.262438
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----------------     Ca = 10.5647
  uM         -------------------------------------------------------
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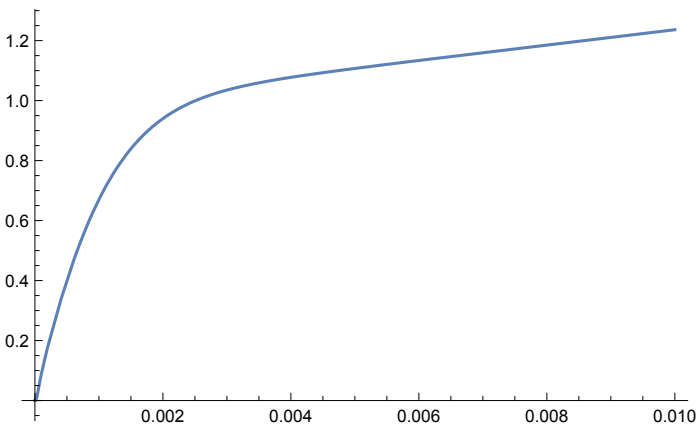

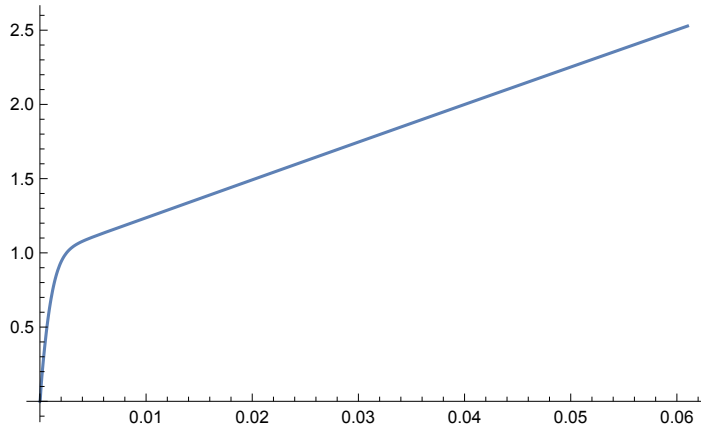


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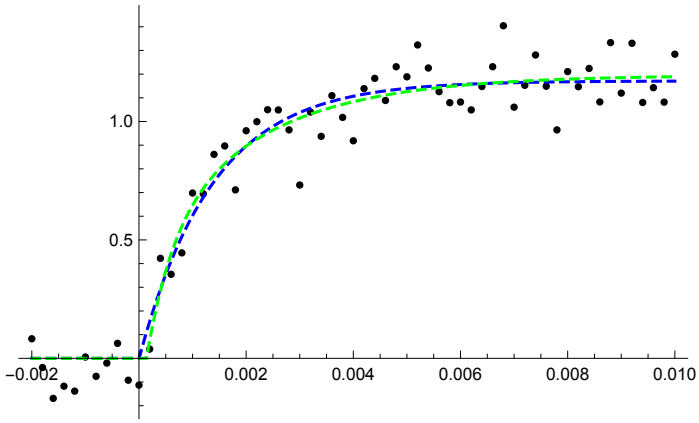


```
Mono: chi2 = 0.672275     d = 0.672275     a = 1.17113     t = 0.00137867
Bi: ratio chi2Mono/chi2Bi = 1.03855     d = 0.000141393     a =
 1.19564     a1 = 0.4997     t1 =0.000487734     t2 = 0.00211125
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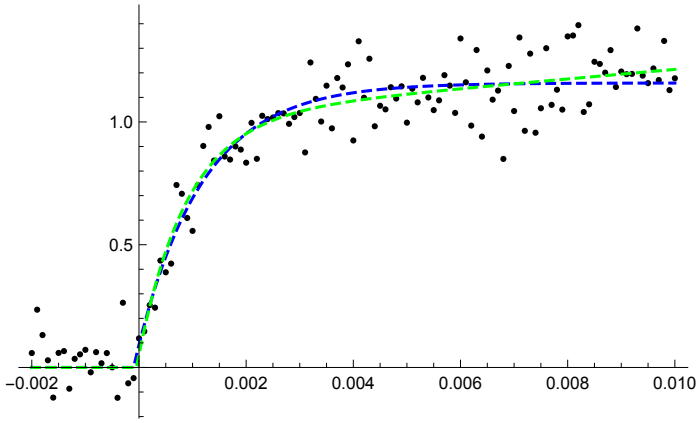


```
Mono: chi2 = 1.43531     d = 1.43531     a = 1.15868     t = 0.0012174
Bi: ratio chi2Mono/chi2Bi = 1.05417     d = -0.0000465898
      a = 7.44551     a1 = 1.01668     t1 =0.000903337     t2 = 0.3223
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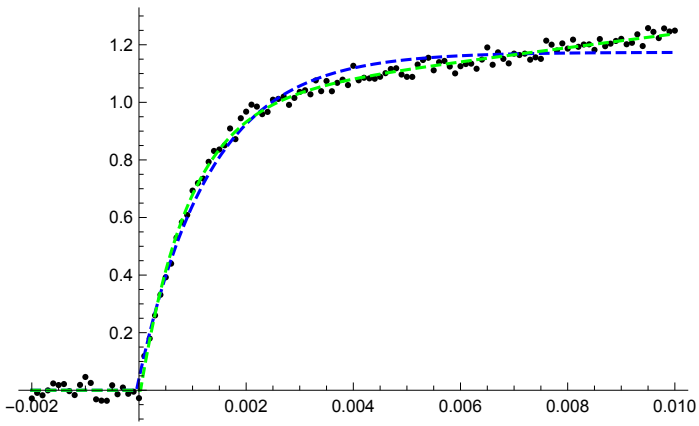

```
Mono: chi2 = 0.151988     d = 0.151988     a = 1.17383     t = 0.00132111
Bi: ratio chi2Mono/chi2Bi = 3.09962     d = 0.0000299675     a =
 7.1834     a1 = 0.995246     t1 =0.000902962     t2 = 0.249278
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----------------     Ca = 11.0598
  uM         -------------------------------------------------------
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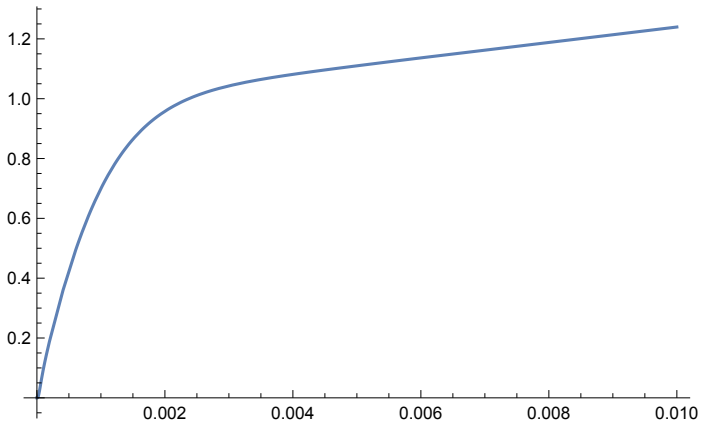


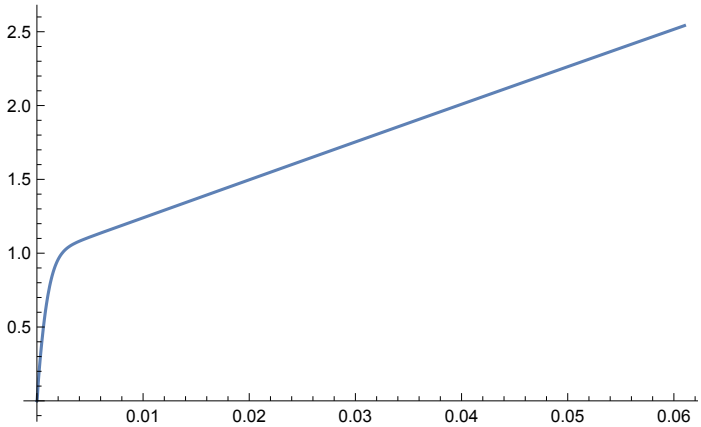


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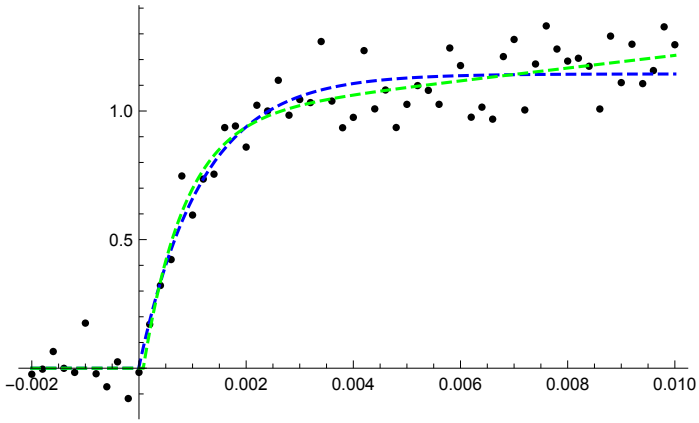


```
Mono: chi2 = 0.58583     d = 0.58583     a = 1.14409     t = 0.00116976

Bi: ratio chi2Mono/chi2Bi = 1.13638     d = 0.0000801764     a =
 10.627     a1 = 0.969792     t1 =0.000772022     t2 = 0.383763

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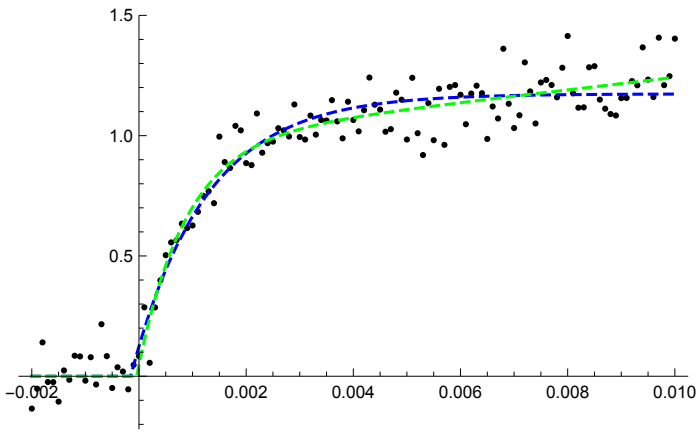


```
Mono: chi2 = 1.0358     d = 1.0358     a = 1.17359     t = 0.00138373
Bi: ratio chi2Mono/chi2Bi = 1.13634     d = -0.0000431649     a =
 10.7232     a1 = 0.978113     t1 =0.00089088     t2 = 0.365395
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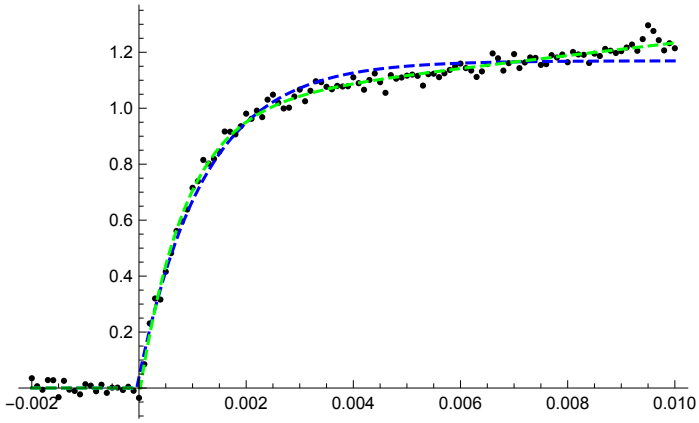


```
Mono: chi2 = 0.159464     d = 0.159464     a = 1.16945     t = 0.00122553
Bi: ratio chi2Mono/chi2Bi = 2.84733     d = 0.0000245468     a =
 7.20708     a1 = 1.00456     t1 =0.000856415     t2 = 0.26526
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----------------     Ca = 11.5813
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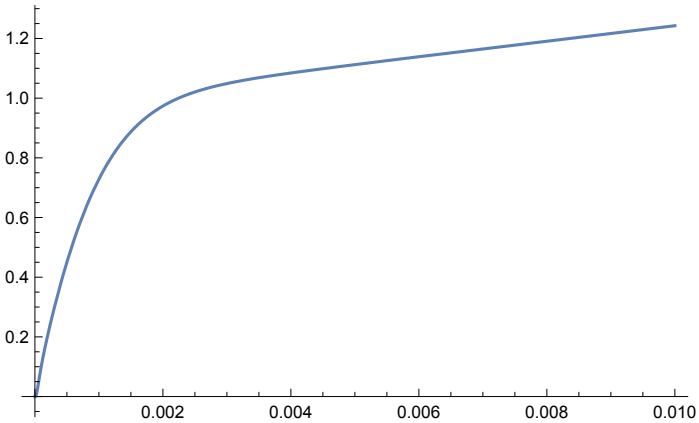

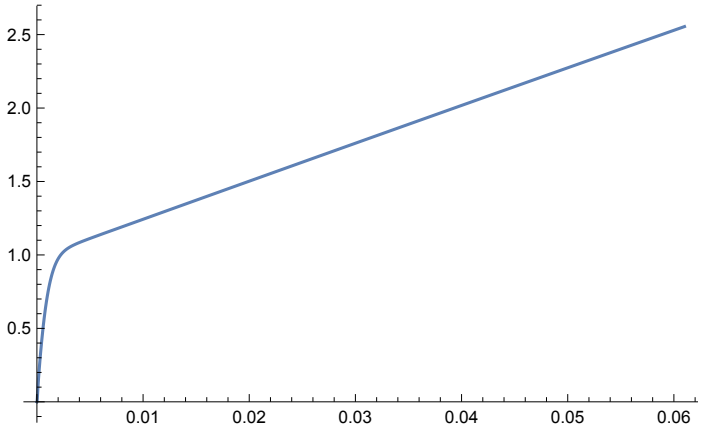


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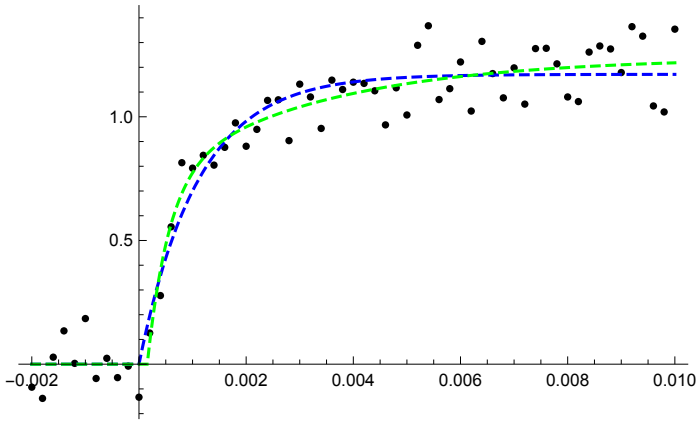


```
Mono: chi2 = 0.664606     d = 0.664606     a = 1.17151     t = 0.00109763
Bi: ratio chi2Mono/chi2Bi = 1.149     d = 0.000154785     a =
 1.24009     a1 = 0.750198     t1 =0.000401778     t2 = 0.00316907
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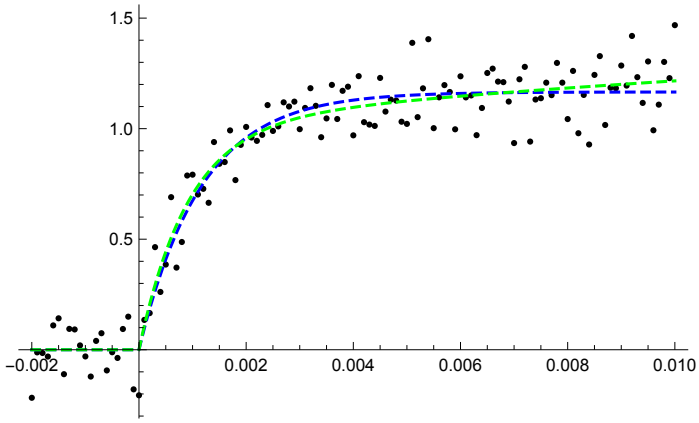


Mono: chi2 = 1.50503 d = 1.50503 a = 1.16586 t = 0.00115764

Bi: ratio chi2Mono/chi2Bi = 1.02571 d = $-5.93501 \times 10^{-17}$ a = 1.51419 a1 = 1.01671 t1 =0.00090964 t2 = 0.0195272

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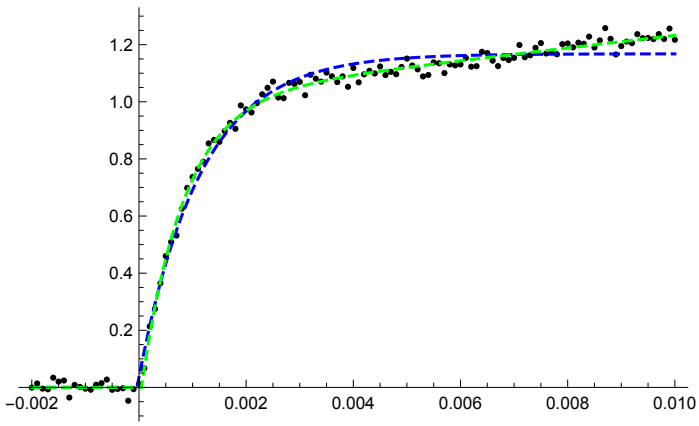

```
Mono: chi2 = 0.155538     d = 0.155538     a = 1.16802     t = 0.00115487
Bi: ratio chi2Mono/chi2Bi = 3.09886     d = 0.0000461266     a =
 7.77001     a1 = 1.01023     t1 =0.000792867     t2 = 0.297572
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 12.1299
  uM         -------------------------------------------------------
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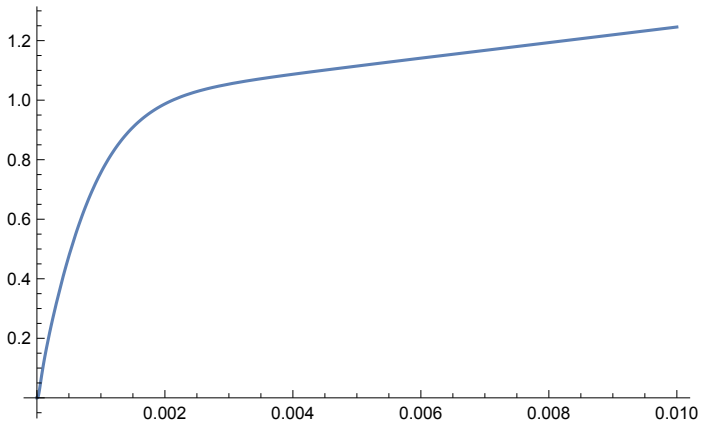


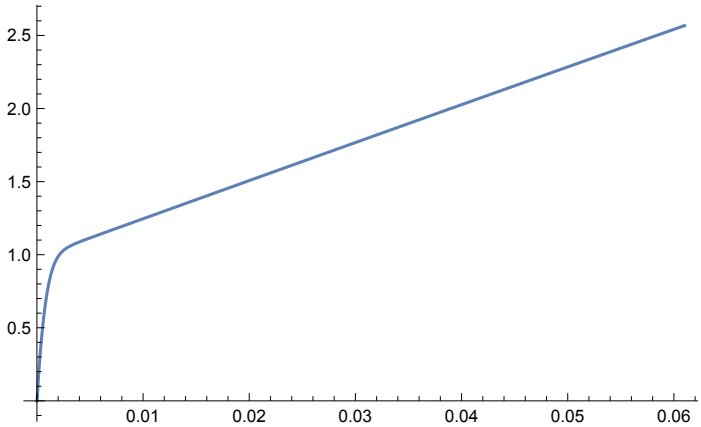


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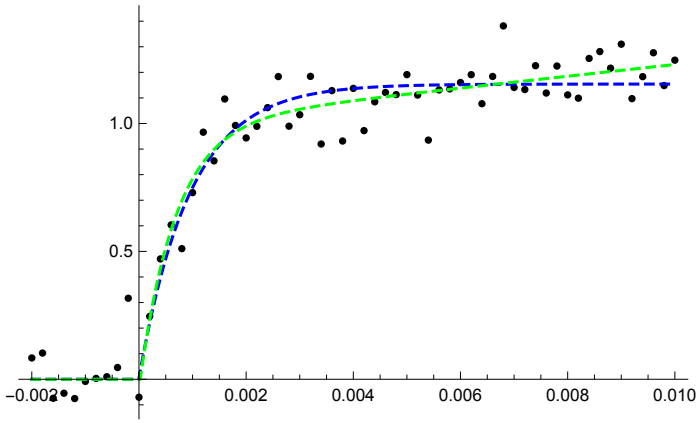


```
Mono: chi2 = 0.579655     d = 0.579655     a = 1.15417     t = 0.0009568

Bi: ratio chi2Mono/chi2Bi = 1.15969     d = 0.0000229046     a =
 5.91271     a1 = 0.997452     t1 =0.000681064     t2 = 0.205333

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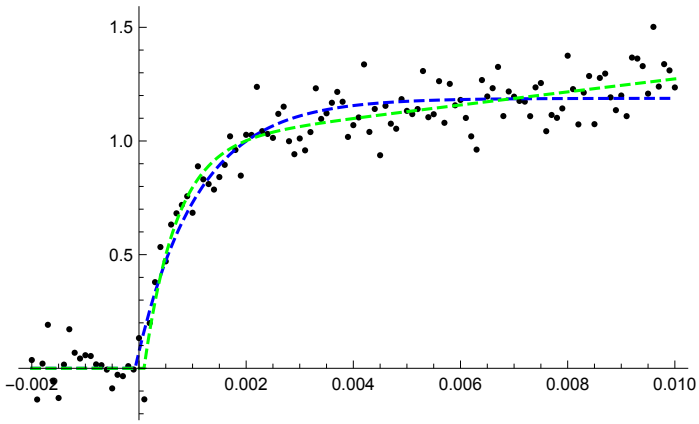


```
Mono: chi2 = 1.17934     d = 1.17934     a = 1.18766     t = 0.00112576
Bi: ratio chi2Mono/chi2Bi = 1.19771     d = 0.0000944725     a =
 8.51641     a1 = 0.985441     t1 =0.000597135     t2 = 0.25425
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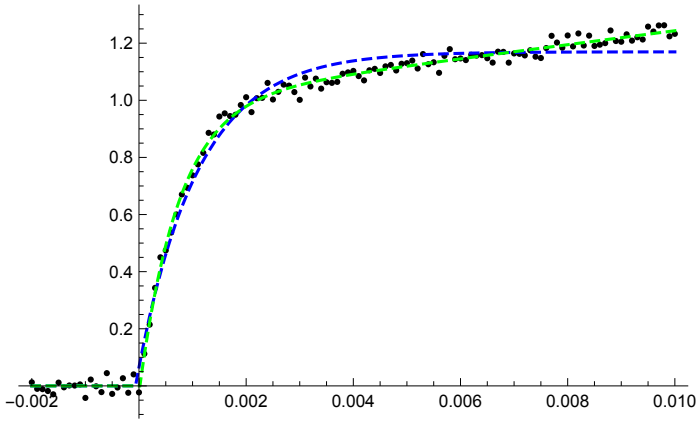


```
Mono: chi2 = 0.195572     d = 0.195572     a = 1.16967     t = 0.00112622
Bi: ratio chi2Mono/chi2Bi = 3.82753     d = 0.0000175702     a =
 6.07616     a1 = 0.994715     t1 =0.00073302     t2 = 0.198792
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----------------     Ca = 12.7076
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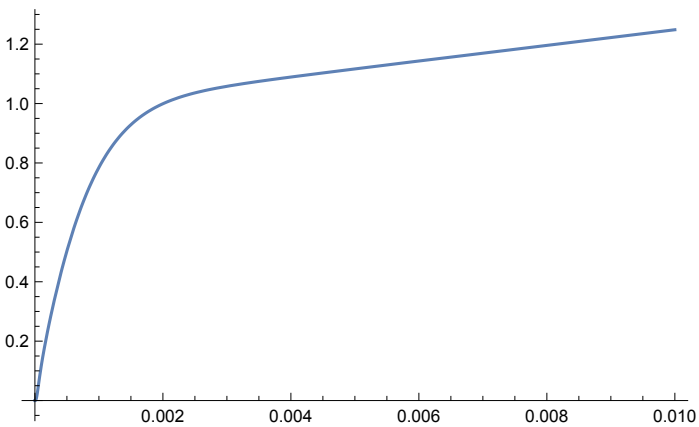

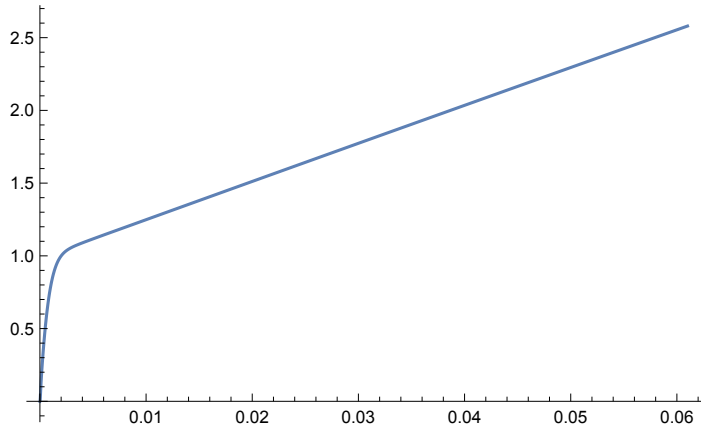


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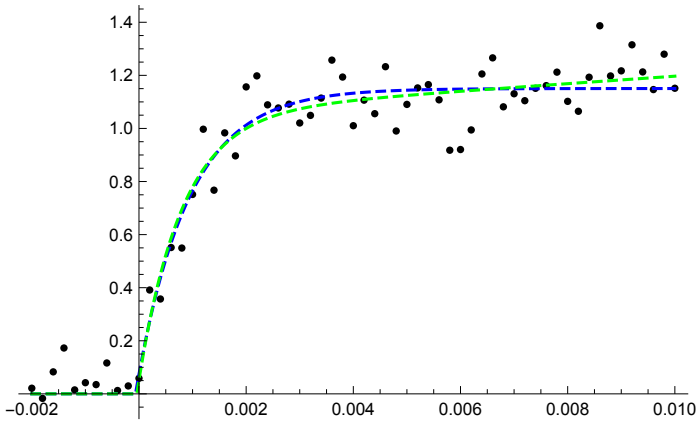


```
Mono: chi2 = 0.560016     d = 0.560016     a = 1.15041     t = 0.000973473
Bi: ratio chi2Mono/chi2Bi = 1.05571     d = -0.0000401171
      a = 7.7724     a1 = 1.05436     t1 =0.000806068     t2 = 0.468245
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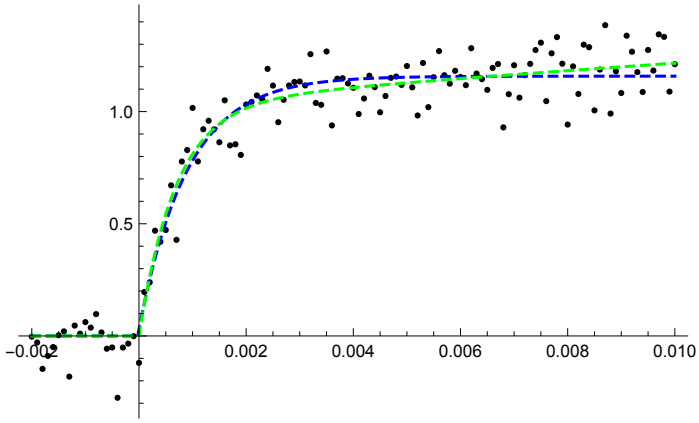


Mono: chi2 = 1.23817  d = 1.23817  a = 1.15788  t = 0.000910491

Bi: ratio chi2Mono/chi2Bi = 1.07536  d = $-1.71403 \times 10^{-17}$  a = 1.85784  a1 = 1.02983  t1 =0.000687285  t2 = 0.0393093

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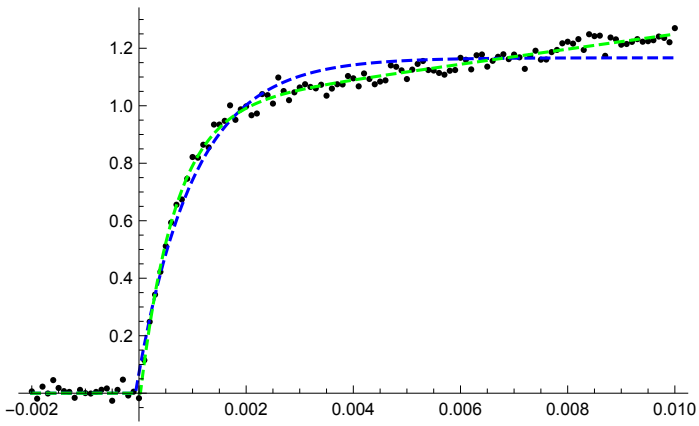

```
Mono: chi2 = 0.234665     d = 0.234665     a = 1.16678     t = 0.00105489
Bi: ratio chi2Mono/chi2Bi = 4.63242     d = 0.0000267977     a =
 10.722     a1 = 0.985745     t1 =0.000649631     t2 = 0.363504
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----------------     Ca = 13.3154
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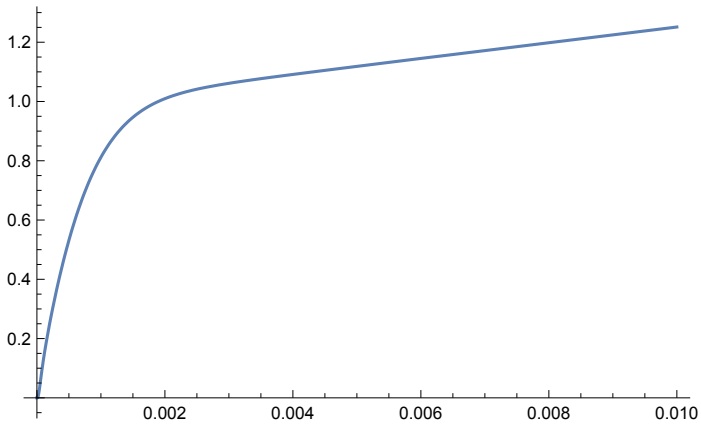


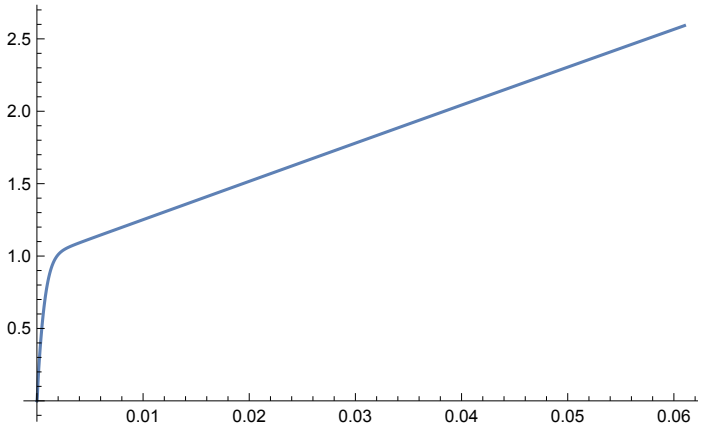


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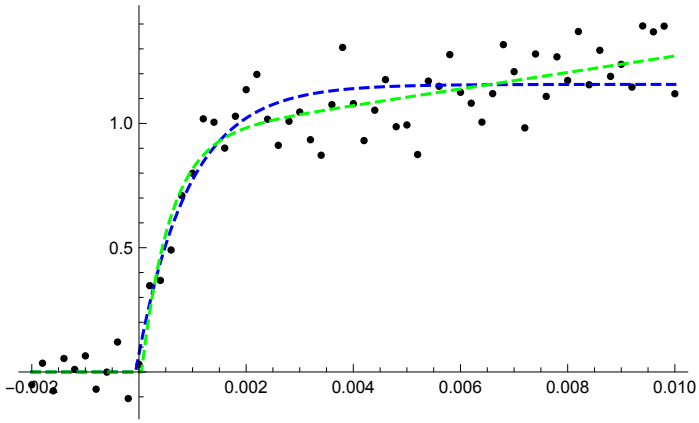


```
Mono: chi2 = 0.871527     d = 0.871527     a = 1.15704     t = 0.000962301

Bi: ratio chi2Mono/chi2Bi = 1.30522     d = 0.0000476611     a =
 16.0084     a1 = 0.939723     t1 =0.000528527     t2 = 0.447452

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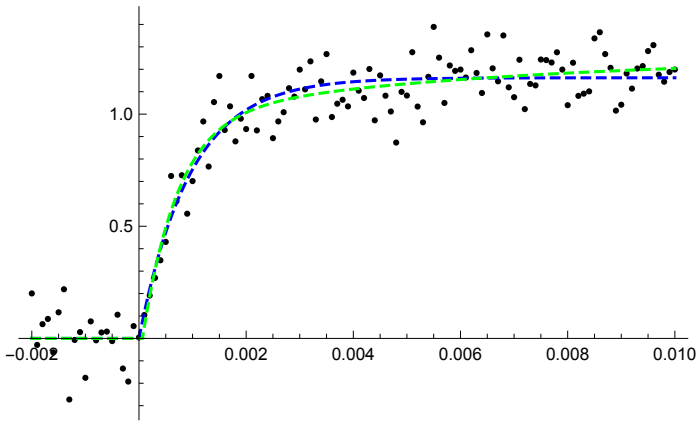


```
Mono: chi2 = 1.38264     d = 1.38264     a = 1.16212     t = 0.000956067
Bi: ratio chi2Mono/chi2Bi = 1.05355     d = 0.0000650498     a =
 1.25812     a1 = 0.986015     t1 =0.000659752     t2 = 0.00616336
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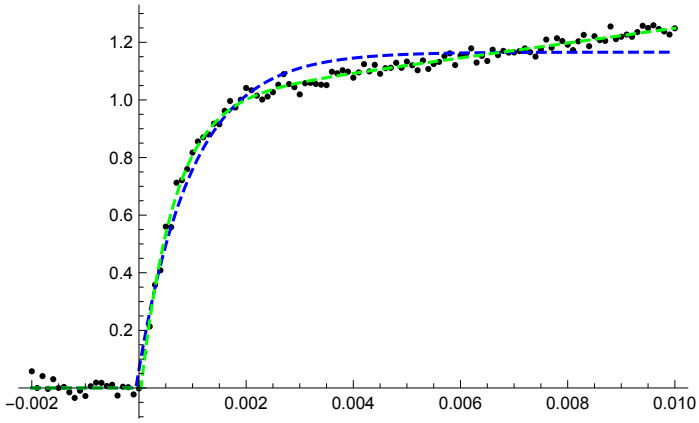


```
Mono: chi2 = 0.230838     d = 0.230838     a = 1.16581     t = 0.00100421
Bi: ratio chi2Mono/chi2Bi = 5.3065     d = 0.0000376195     a =
 11.1936     a1 = 0.990126     t1 =0.000616041     t2 = 0.387771
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----------------     Ca = 13.9549
  uM         -------------------------------------------------------
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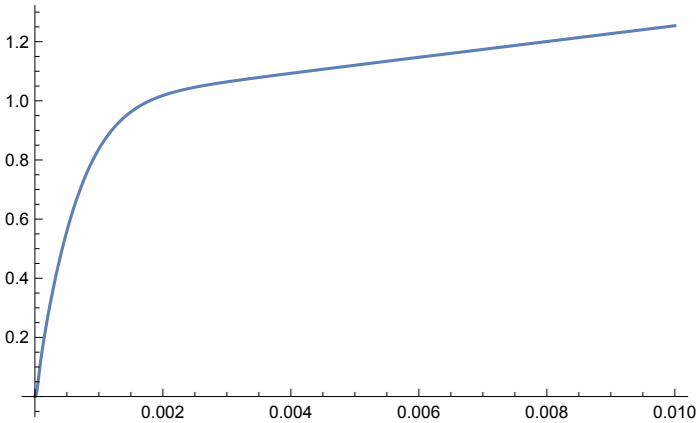

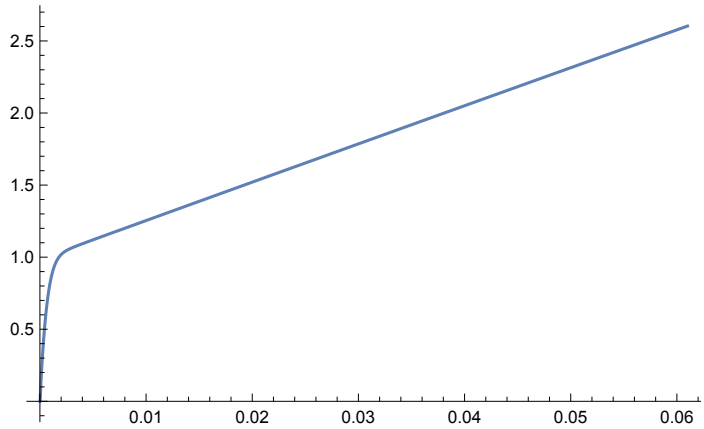


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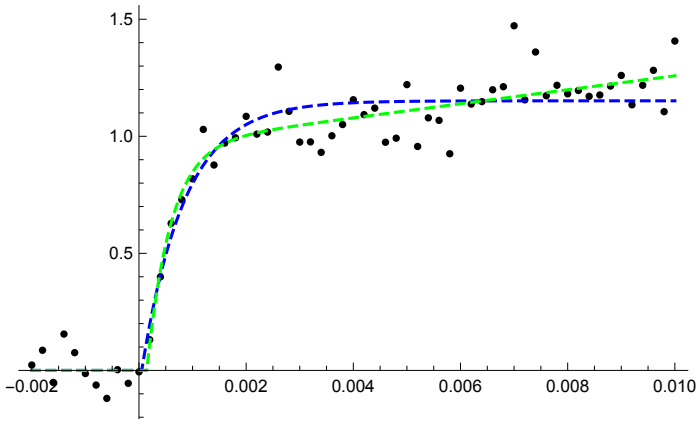


```
Mono: chi2 = 0.690695     d = 0.690695     a = 1.15155     t = 0.000802626
Bi: ratio chi2Mono/chi2Bi = 1.34941     d = 0.000146441     a =
 10.0289     a1 = 0.961465     t1 =0.000443239     t2 = 0.295905
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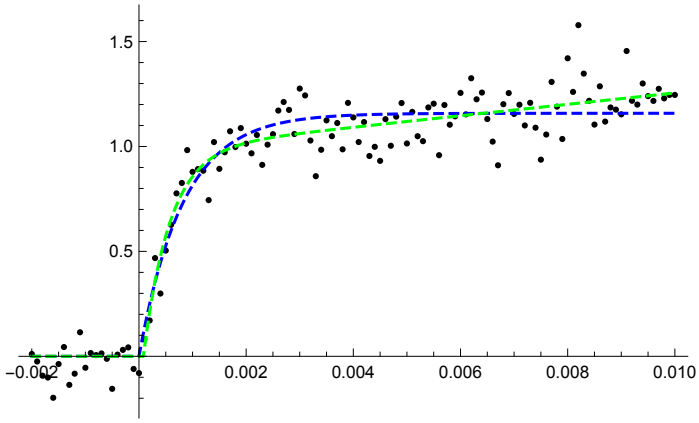


```
Mono: chi2 = 1.54984     d = 1.54984     a = 1.1582     t = 0.000822824
Bi: ratio chi2Mono/chi2Bi = 1.21303     d = 0.0000824949     a =
 11.137     a1 = 0.983574     t1 =0.000492187     t2 = 0.365992
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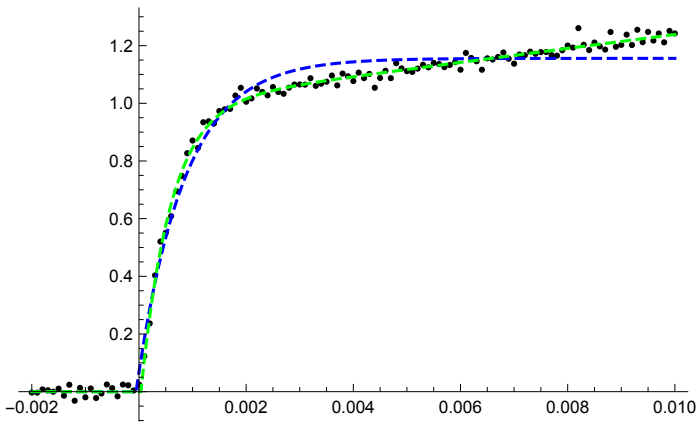

```
Mono: chi2 = 0.230725     d = 0.230725     a = 1.15583     t = 0.000890868
Bi: ratio chi2Mono/chi2Bi = 5.67381     d = 0.0000368321     a =
 6.97739     a1 = 0.99437     t1 =0.000551213     t2 = 0.239104
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 14.63
  uM         -------------------------------------------------------
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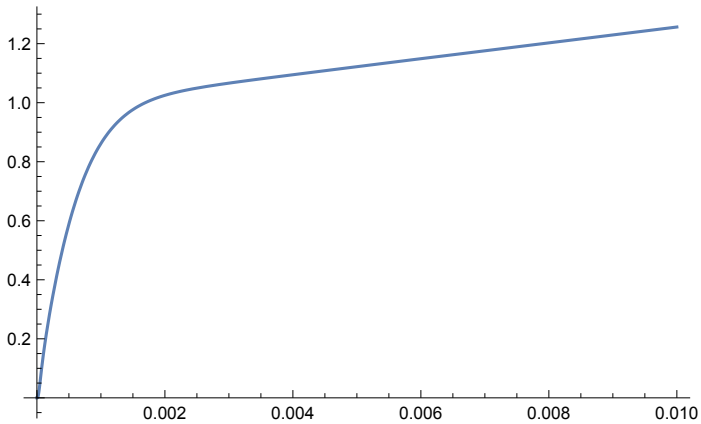


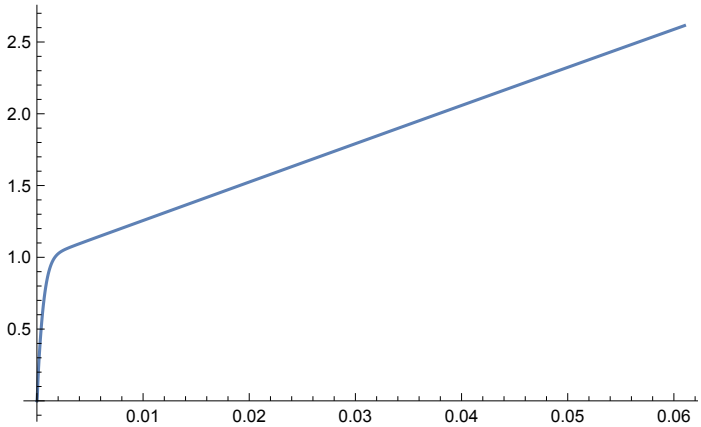


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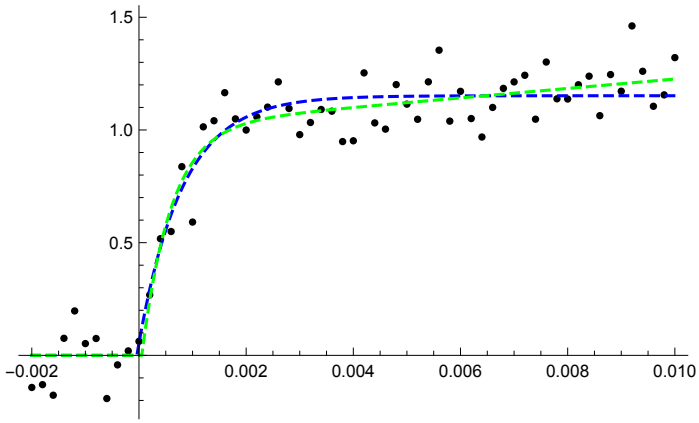


```
Mono: chi2 = 0.785277     d = 0.785277     a = 1.15186     t = 0.000816573

Bi: ratio chi2Mono/chi2Bi = 1.11264     d = 0.0000528259     a =
 9.38255     a1 = 1.01633     t1 =0.000547426     t2 = 0.39197

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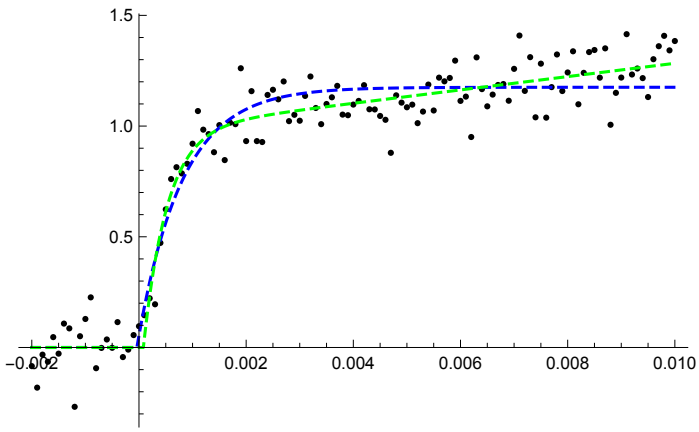


```
Mono: chi2 = 1.51626     d = 1.51626     a = 1.17525     t = 0.000825054
Bi: ratio chi2Mono/chi2Bi = 1.31093     d = 0.0000821037     a =
 22.7417     a1 = 0.984247     t1 =0.000442155     t2 = 0.716229
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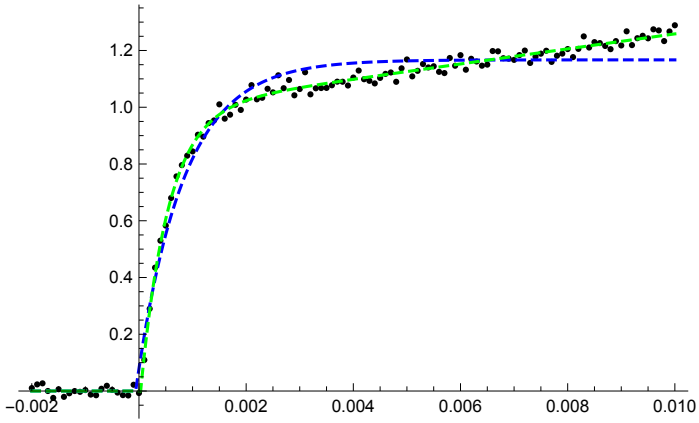


```
Mono: chi2 = 0.283214     d = 0.283214     a = 1.16695     t = 0.000876939
Bi: ratio chi2Mono/chi2Bi = 6.29203     d = 0.0000309699     a =
 7.14032     a1 = 0.990762     t1 =0.000512968     t2 = 0.22394
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  -------------------------
----------------     Ca = 15.3404
  uM         -------------------------------------------------------
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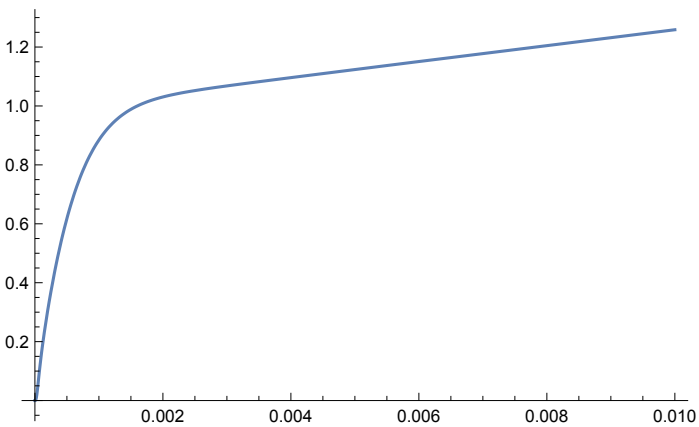

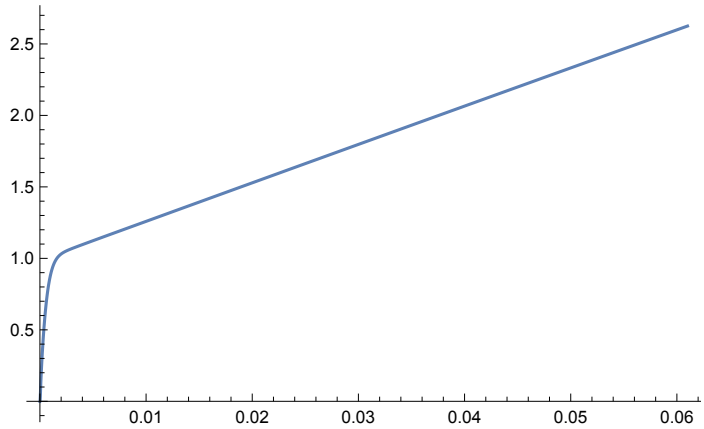


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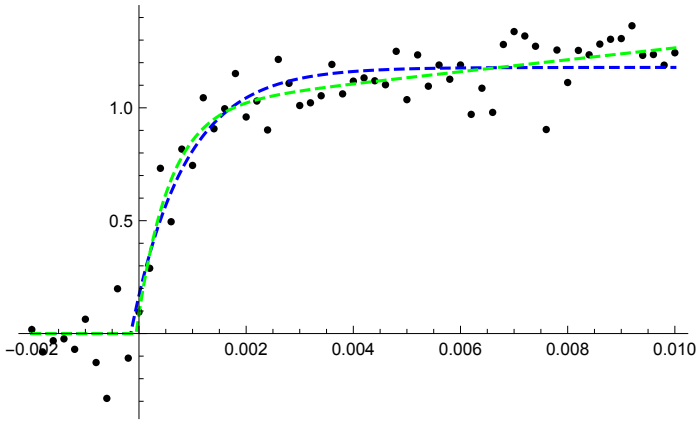


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Mono: chi2 = 0.792846     d = 0.792846     a = 1.179     t = 0.000993536
Bi: ratio chi2Mono/chi2Bi = 1.16119     d = -0.0000533795     a =
 9.86311     a1 = 0.99811     t1 =0.000597496     t2 = 0.328307
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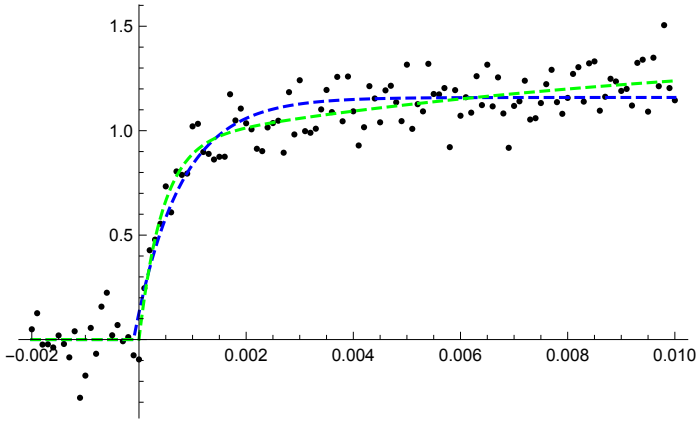


Mono: chi2 = 1.4832 d = 1.4832 a = 1.15907 t = 0.000857489

Bi: ratio chi2Mono/chi2Bi = 1.20775 d = $5.29904 \times 10^{-20}$ a = 1.41465 a1 = 0.935525 t1 =0.000433252 t2 = 0.00998835

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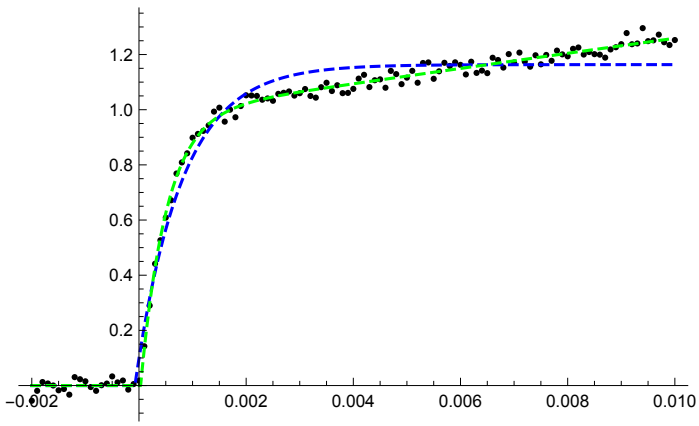

```
Mono: chi2 = 0.313316     d = 0.313316     a = 1.16346     t = 0.000863791
Bi: ratio chi2Mono/chi2Bi = 6.46654     d = 0.000030485     a =
 7.19456     a1 = 0.982519     t1 =0.00048217     t2 = 0.218982
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----------------     Ca = 16.0887
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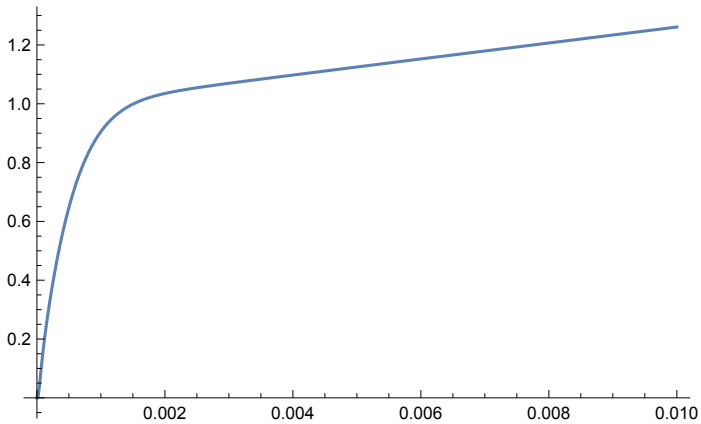


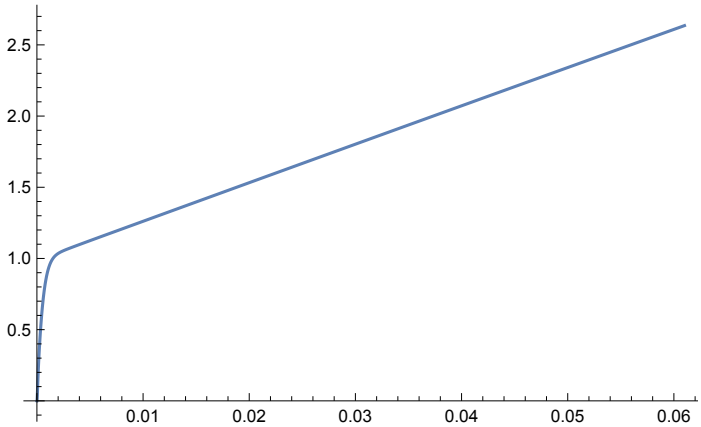


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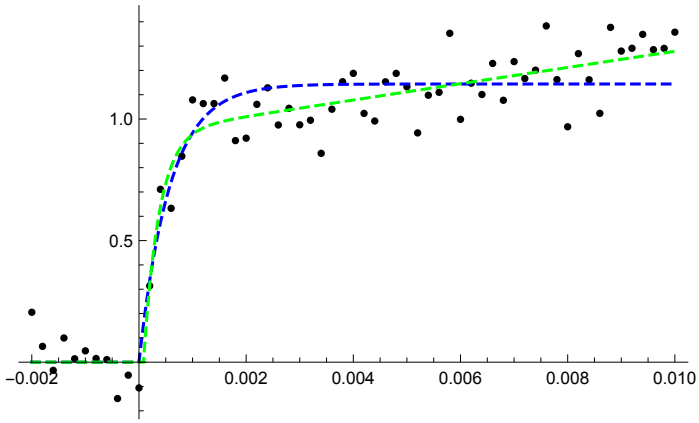


```
Mono: chi2 = 0.918424     d = 0.918424     a = 1.14409     t = 0.000574874

Bi: ratio chi2Mono/chi2Bi = 1.46868     d = 0.0000836647     a =
 16.2527     a1 = 0.945883     t1 =0.000290457     t2 = 0.451256

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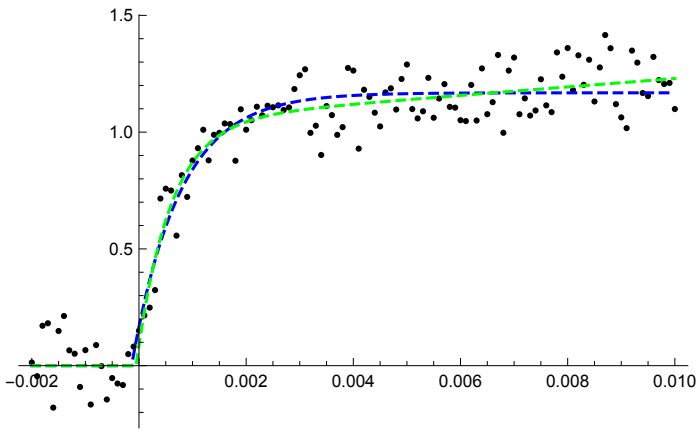


```
Mono: chi2 = 1.34143     d = 1.34143     a = 1.16838     t = 0.000895209
Bi: ratio chi2Mono/chi2Bi = 1.0811     d = -0.0000542779     a =
 5.4752     a1 = 1.04557     t1 =0.000629009     t2 = 0.237057
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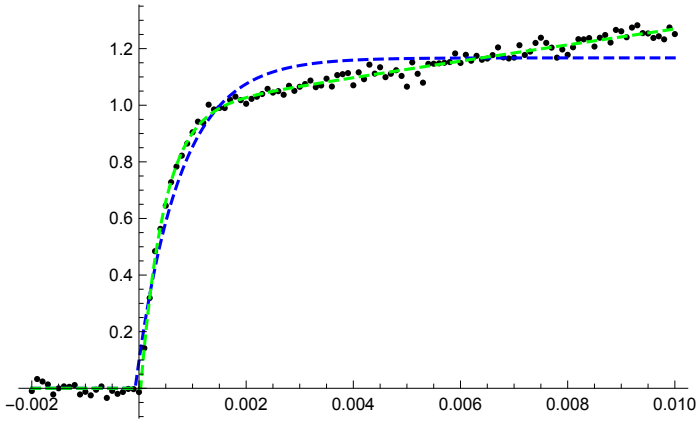


```
Mono: chi2 = 0.356682     d = 0.356682     a = 1.16729     t = 0.000815013
Bi: ratio chi2Mono/chi2Bi = 8.88035     d = 0.0000311899     a =
 3.68539     a1 = 0.976881     t1 =0.000434112     t2 = 0.0872521
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----------------     Ca = 16.8774
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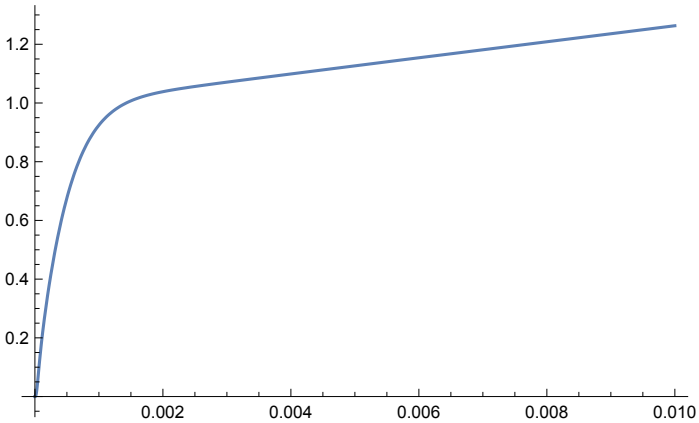

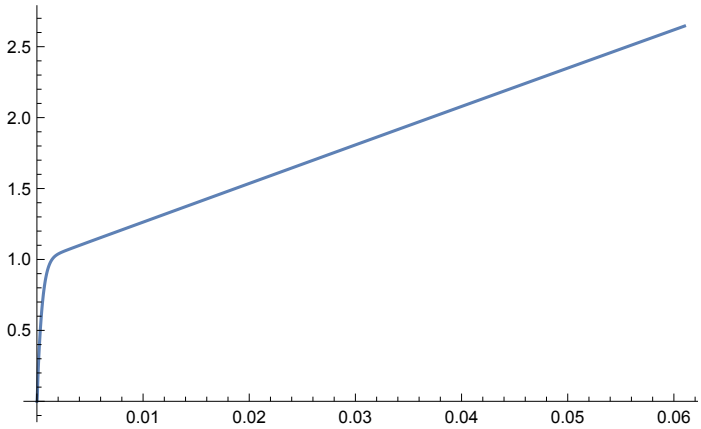


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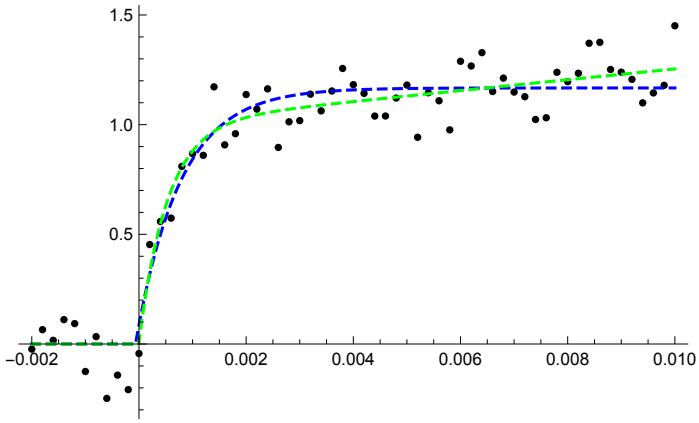


Mono: chi2 = 0.793174 d = 0.793174 a = 1.1673 t = 0.000832093

Bi: ratio chi2Mono/chi2Bi = 1.1617 d = $-5.37695 \times 10^{-6}$ a = 7.89496 a1 = 1.00457 t1 =0.000530316 t2 = 0.271394

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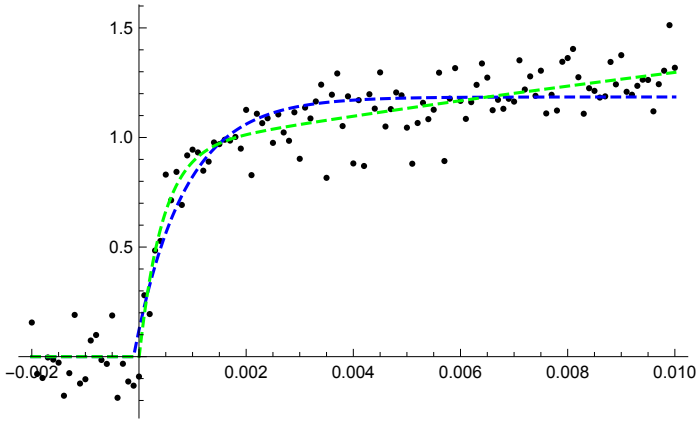


Mono: chi2 = 1.75261 d = 1.75261 a = 1.1849 t = 0.000930679

Bi: ratio chi2Mono/chi2Bi = 1.32611 d = $3.89867 \times 10^{-6}$ a = 2.30544 a1 = 0.942354 t1 =0.000432893 t2 = 0.0331707

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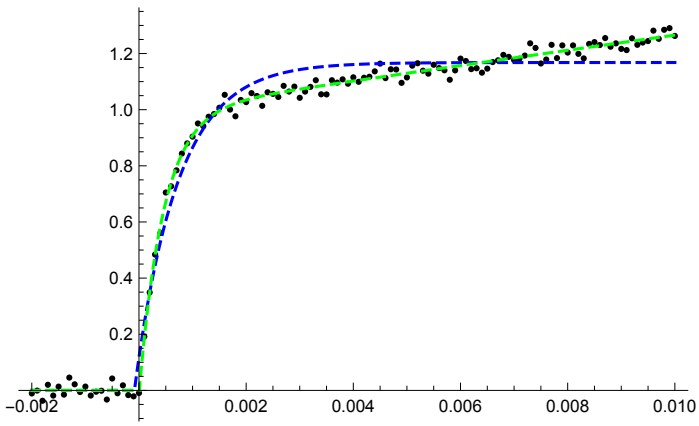

Mono: chi2 = 0.334774 d = 0.334774 a = 1.16802 t = 0.000803881

Bi: ratio chi2Mono/chi2Bi = 6.71016 d = $5.89528 \times 10^{-6}$ a = 6.59028 a1 = 0.990604 t1 =0.000453485 t2 = 0.198487

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---------- Ca = 17.7084 uM ----------

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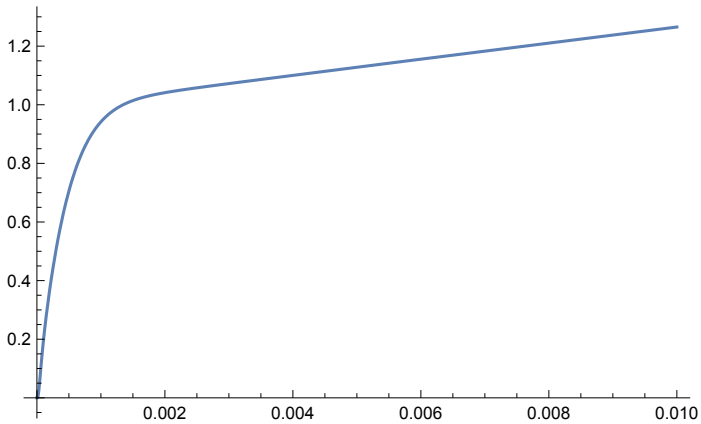


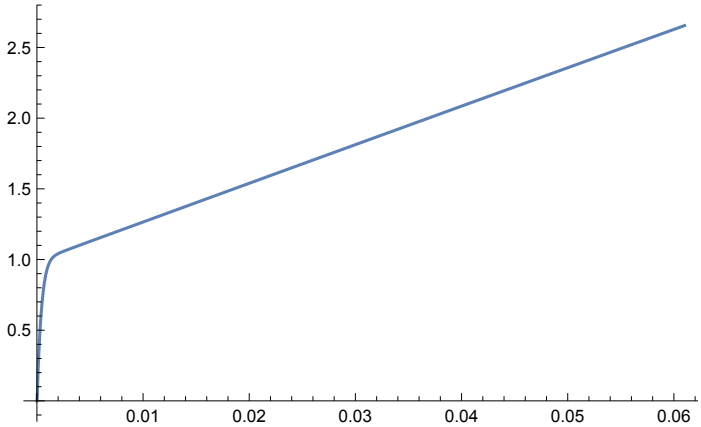


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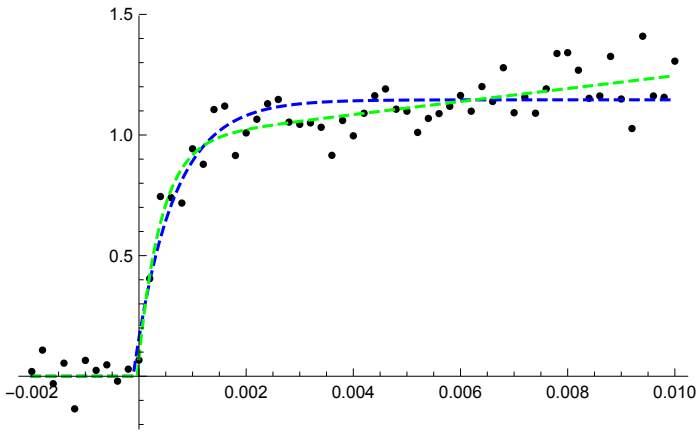


```
Mono: chi2 = 0.554108     d = 0.554108     a = 1.14585     t = 0.000735605
Bi: ratio chi2Mono/chi2Bi = 1.39005     d = -0.0000338111     a =
 8.12846     a1 = 0.974269     t1 =0.000424642     t2 = 0.259256
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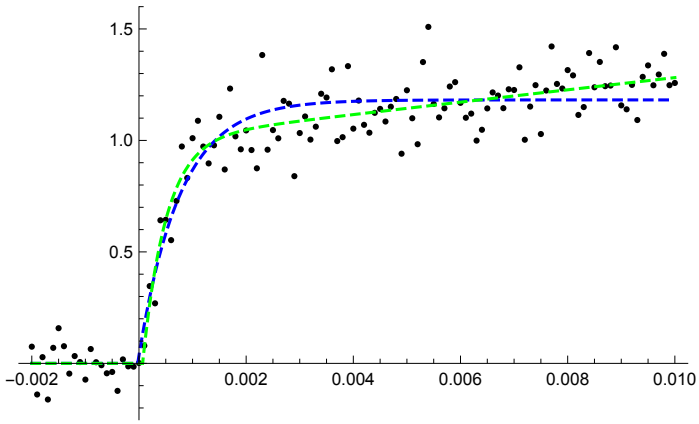


```
Mono: chi2 = 1.67161     d = 1.67161     a = 1.1817     t = 0.000771801
Bi: ratio chi2Mono/chi2Bi = 1.21612     d = 0.0000681834     a =
 7.41195     a1 = 1.00487     t1 =0.000436507     t2 = 0.22482
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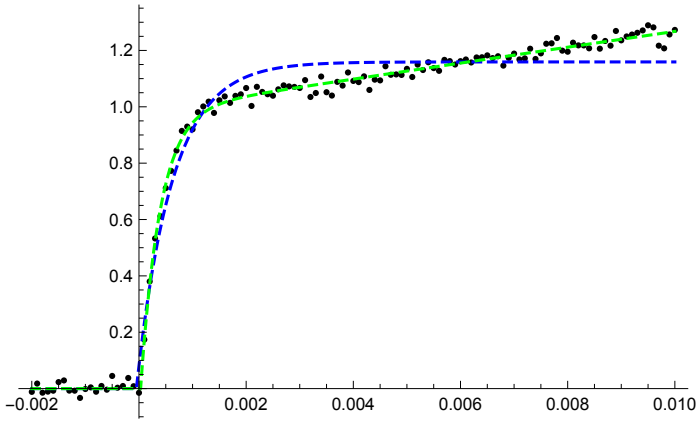


```
Mono: chi2 = 0.404928     d = 0.404928     a = 1.15923     t = 0.000664484
Bi: ratio chi2Mono/chi2Bi = 8.50307     d = 0.000030497     a =
 8.42258     a1 = 0.984037     t1 =0.000364871     t2 = 0.256611
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----------------     Ca = 18.5844
  uM         -------------------------------------------------------
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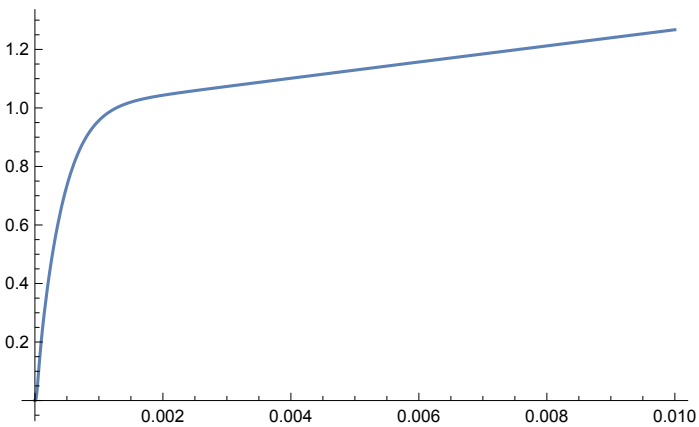

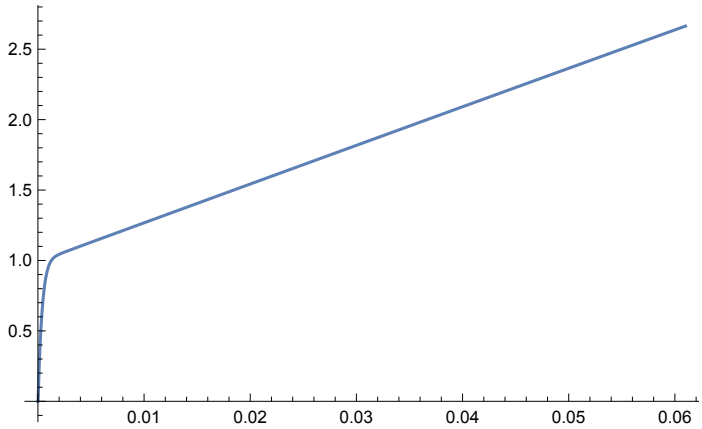


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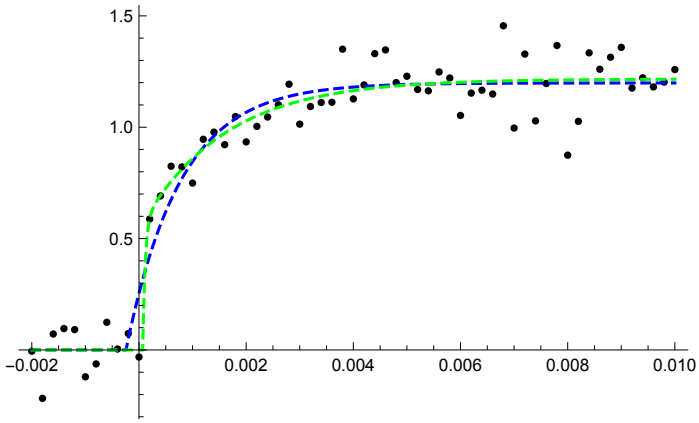


```
Mono: chi2 = 0.828326     d = 0.828326     a = 1.1987     t = 0.00101552
Bi: ratio chi2Mono/chi2Bi = 1.22601     d = 0.0000702661     a =
 1.21661     a1 = 0.570874     t1 =0.0000462694     t2 = 0.00156324
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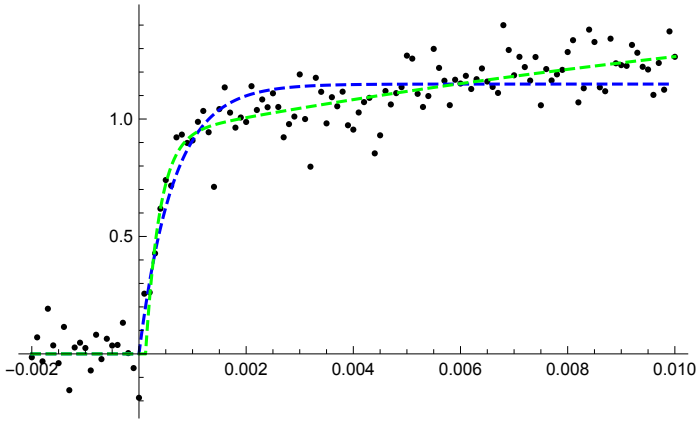


```
Mono: chi2 = 1.44826     d = 1.44826     a = 1.14886     t = 0.0006383
Bi: ratio chi2Mono/chi2Bi = 1.42908     d = 0.000122491     a =
 1.71905     a1 = 0.926756     t1 =0.000262552     t2 = 0.0176885
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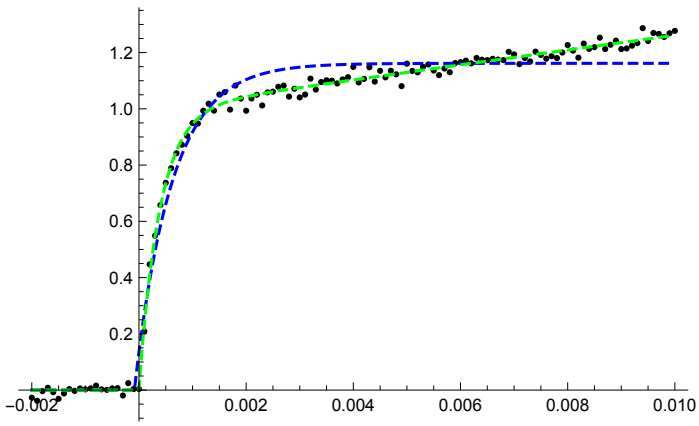

Mono: chi2 = 0.350063 d = 0.350063 a = 1.16181 t = 0.000695524

Bi: ratio chi2Mono/chi2Bi = 7.98209 d = $-2.02956 \times 10^{-6}$ a = 5.22773 a1 = 0.993179 t1 =0.000387382 t2 = 0.152795

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---------- Ca = 19.5079

uM ----------

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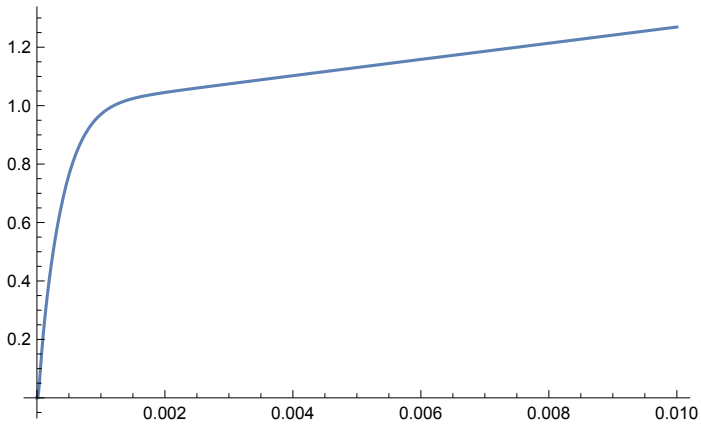


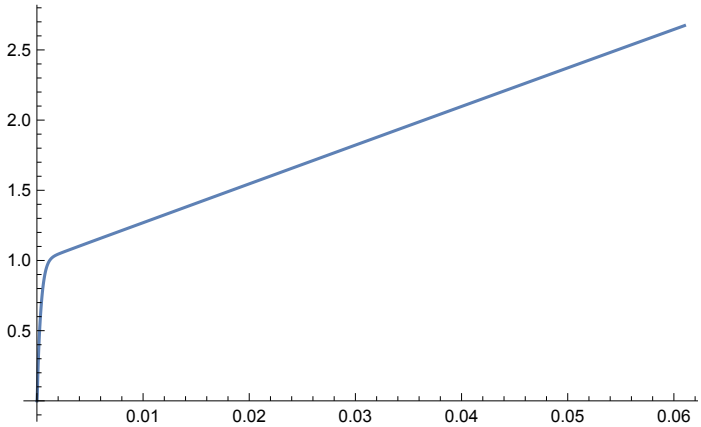


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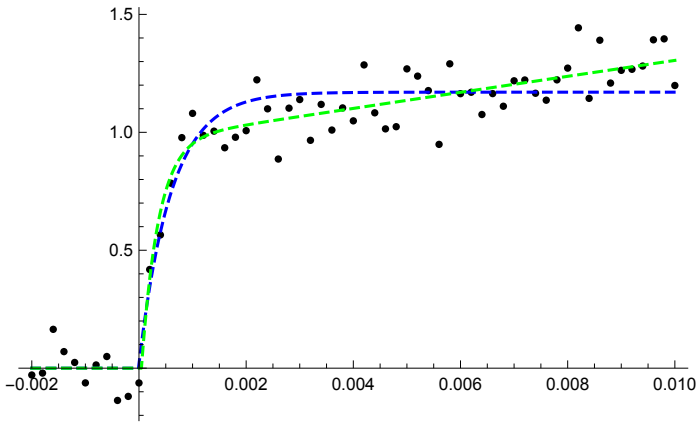


```
Mono: chi2 = 0.779374     d = 0.779374     a = 1.17022     t = 0.000601369

Bi: ratio chi2Mono/chi2Bi = 1.58832     d = 0.0000456958     a =
 13.8263     a1 = 0.965412     t1 =0.000316392     t2 = 0.372147

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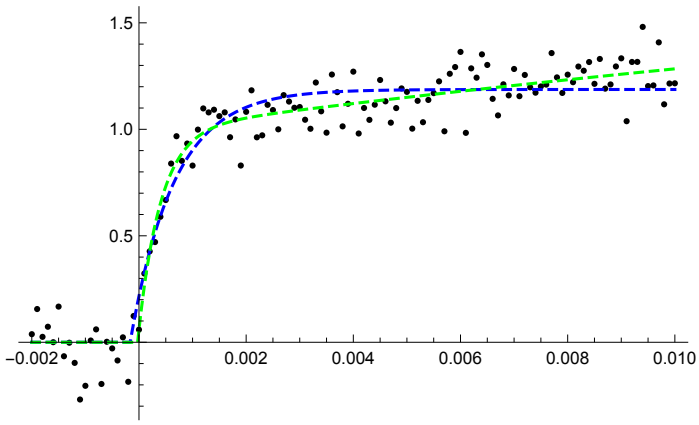


```
Mono: chi2 = 1.4135     d = 1.4135     a = 1.18705     t = 0.000816254
Bi: ratio chi2Mono/chi2Bi = 1.28422     d = -0.0000249588     a =
 2.1567     a1 = 0.994997     t1 =0.000414417     t2 = 0.0350592
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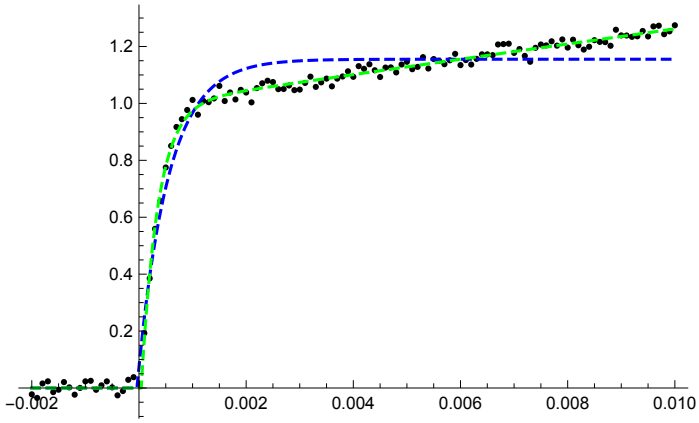


```
Mono: chi2 = 0.39252     d = 0.39252     a = 1.15524     t = 0.000571264
Bi: ratio chi2Mono/chi2Bi = 9.58318     d = 0.0000417723     a =
 5.85351     a1 = 0.992279     t1 =0.000309638     t2 = 0.174699
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----------------     Ca = 20.4816
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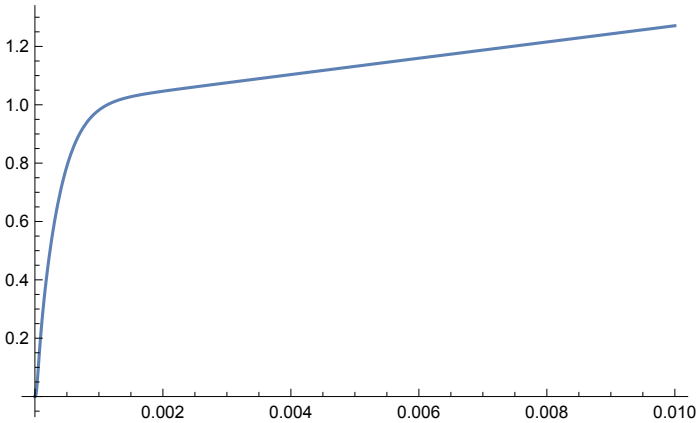

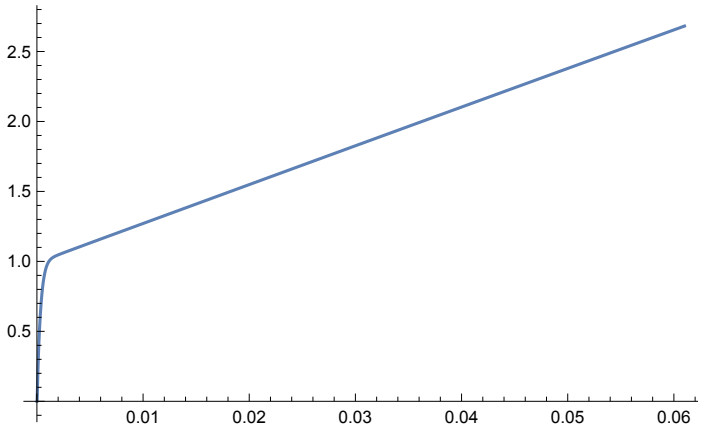


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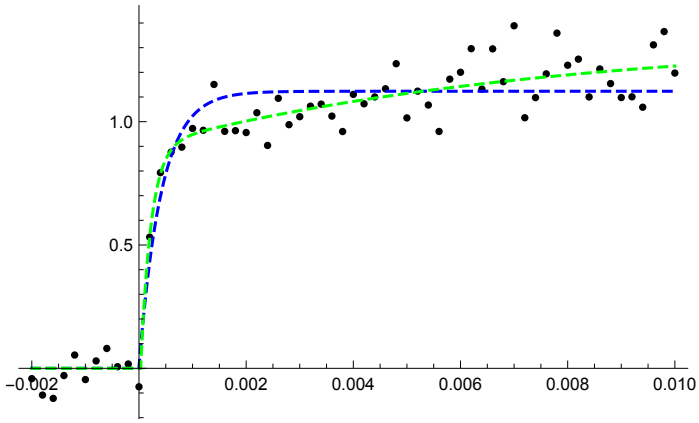


```
Mono: chi2 = 0.691209     d = 0.691209     a = 1.12331     t = 0.000414333
Bi: ratio chi2Mono/chi2Bi = 1.5922     d = 0.0000313475     a =
 1.34267     a1 = 0.900175     t1 =0.000194062     t2 = 0.00750123
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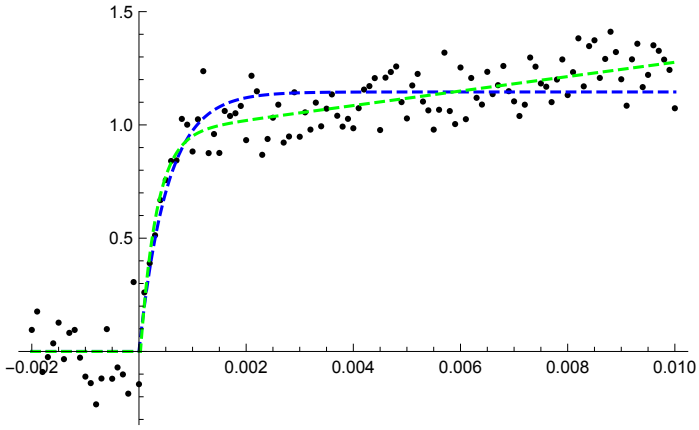


```
Mono: chi2 = 1.76953     d = 1.76953     a = 1.14544     t = 0.000525524
Bi: ratio chi2Mono/chi2Bi = 1.43354     d = 0.0000278015     a =
 9.5747     a1 = 0.95652     t1 =0.000300865     t2 = 0.263547
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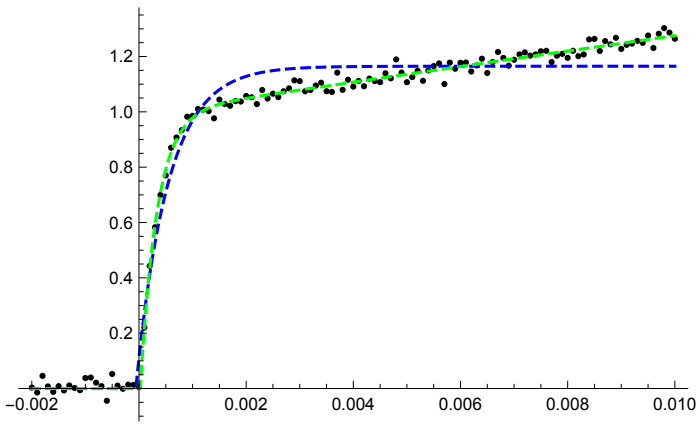

```
Mono: chi2 = 0.428681     d = 0.428681     a = 1.16485     t = 0.000594872
Bi: ratio chi2Mono/chi2Bi = 8.64772     d = 0.0000234707     a =
 6.9197     a1 = 0.993429     t1 =0.000311632     t2 = 0.204832
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----------------     Ca = 21.5084
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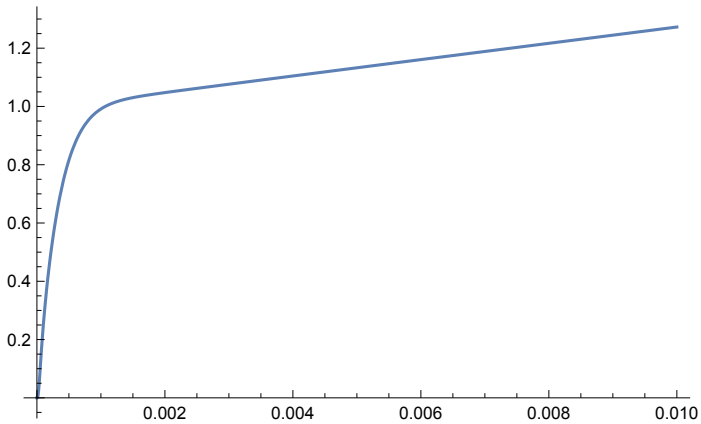


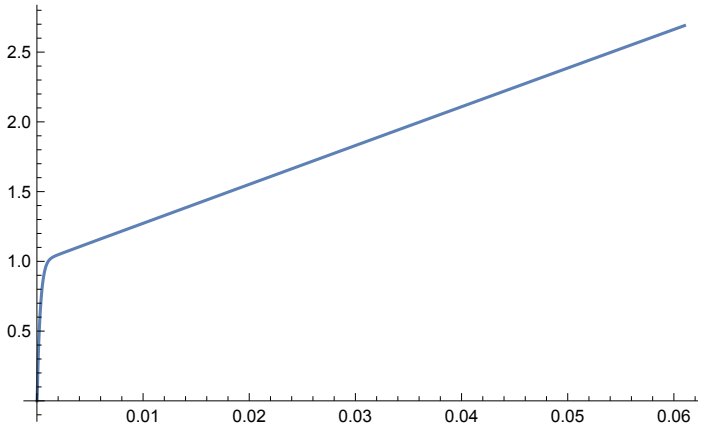


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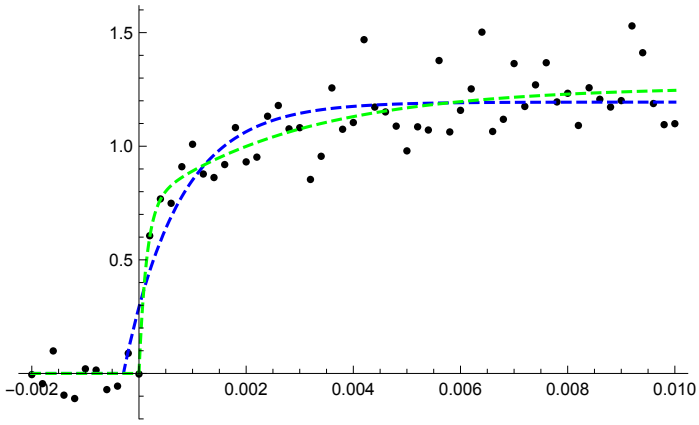


Mono: chi2 = 1.05207  d = 1.05207  a = 1.19419  t = 0.00103309

Bi: ratio chi2Mono/chi2Bi = 1.30416  d = $3.88541 \times 10^{-18}$  a = 1.26273  a1 = 0.739059  t1 =0.000138889  t2 = 0.00290748

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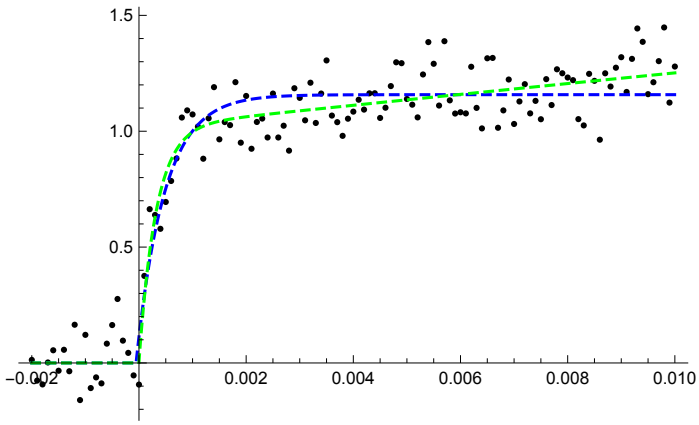


Mono: chi2 = 1.64289 d = 1.64289 a = 1.15778 t = 0.000527514

Bi: ratio chi2Mono/chi2Bi = 1.20007 d = $-1.83561 \times 10^{-6}$ a = 5.22985 a1 = 1.01594 t1 =0.000318885 t2 = 0.173661

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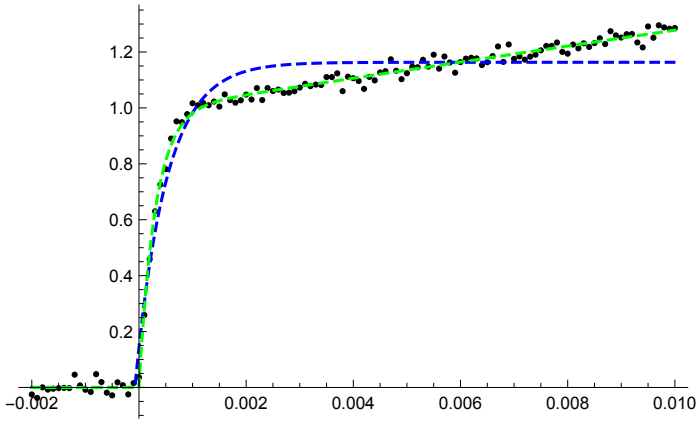


Mono: chi2 = 0.471377 d = 0.471377 a = 1.16315 t = 0.000577166

Bi: ratio chi2Mono/chi2Bi = 9.73567 d = $-2.73319 \times 10^{-6}$ a = 7.8906 a1 = 0.988889 t1 =0.000307392 t2 = 0.233717

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---- Ca = 22.5913

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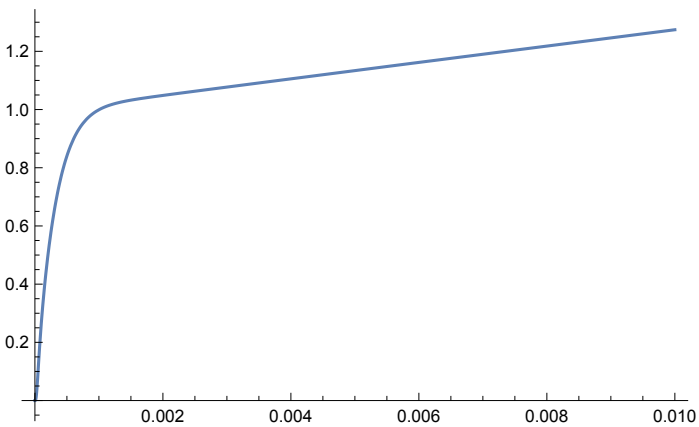

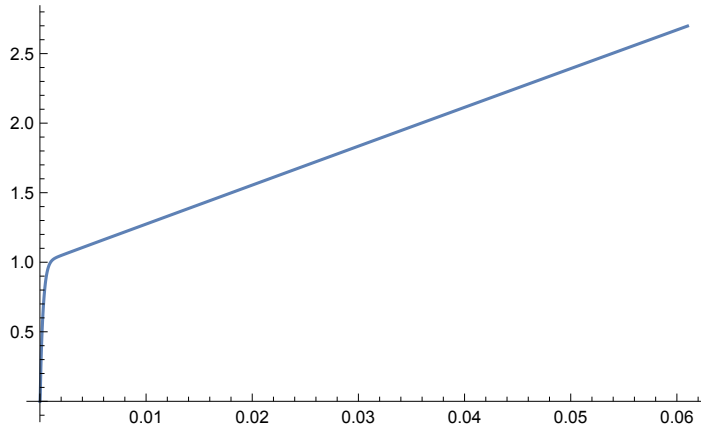


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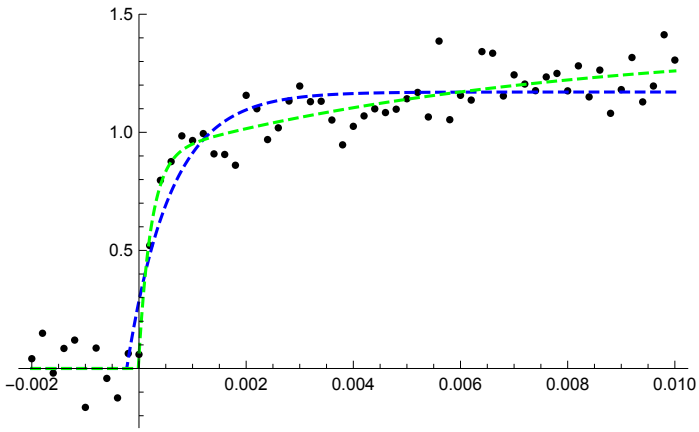


```
Mono: chi2 = 0.72191     d = 0.72191     a = 1.17066     t = 0.000813268
Bi: ratio chi2Mono/chi2Bi = 1.58414     d = -0.000013017     a =
 1.37869     a1 = 0.897704     t1 =0.000229849     t2 = 0.00715459
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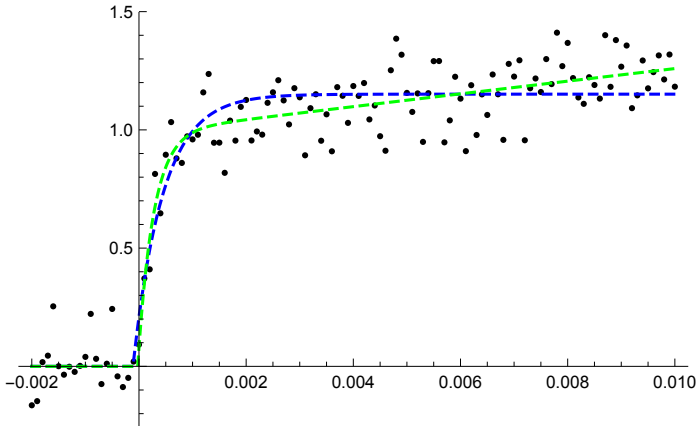


```
Mono: chi2 = 1.85153     d = 1.85153     a = 1.15105     t = 0.000557608
Bi: ratio chi2Mono/chi2Bi = 1.25439     d = -0.0000238022     a =
 7.98495     a1 = 0.988221     t1 =0.000288229     t2 = 0.25379
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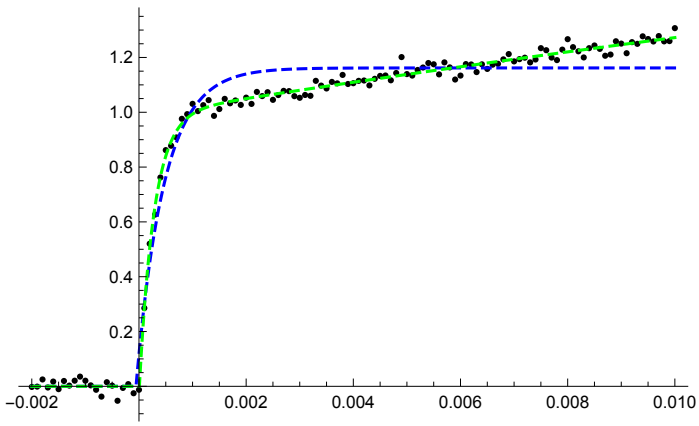

Mono: chi2 = 0.457878 d = 0.457878 a = 1.16177 t = 0.000519292

Bi: ratio chi2Mono/chi2Bi = 9.85875 d = $7.9097 \times 10^{-6}$ a = 2.51729 a1 = 0.989347 t1 =0.000274461 t2 = 0.0487628

---

---------- Ca = 23.7336 uM ----------

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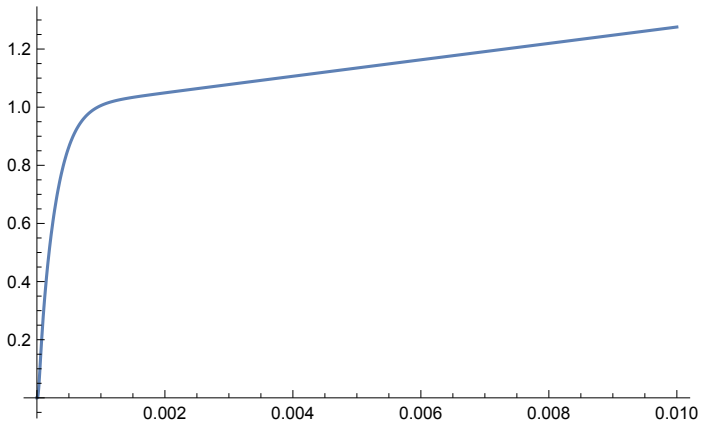


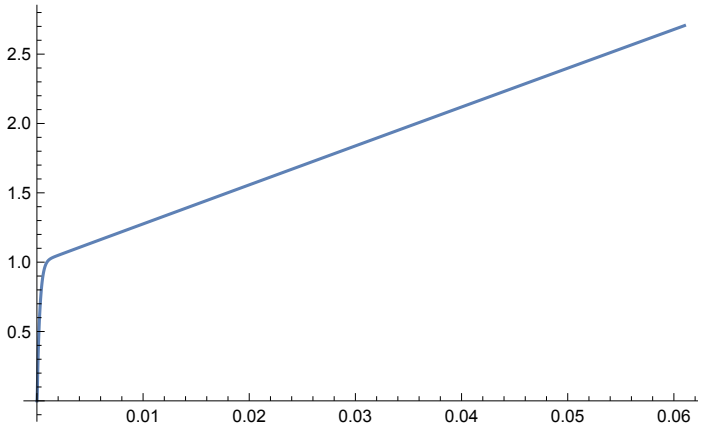


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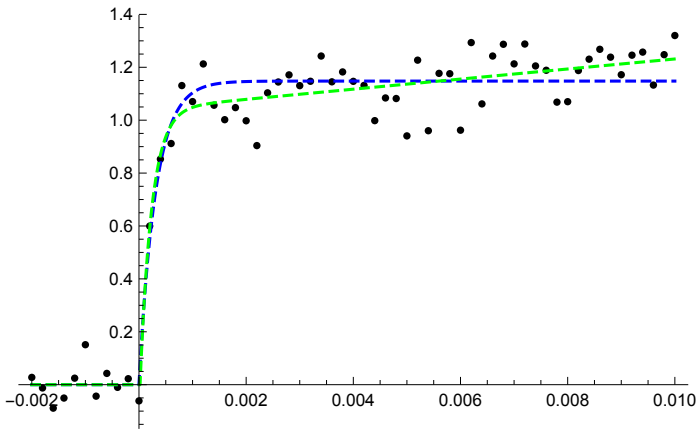


```
Mono: chi2 = 0.536676     d = 0.536676     a = 1.14782     t = 0.00030774

Bi: ratio chi2Mono/chi2Bi = 1.27276     d = 0.0000201003     a =
 9.30447     a1 = 1.04058     t1 =0.000216372     t2 = 0.427128

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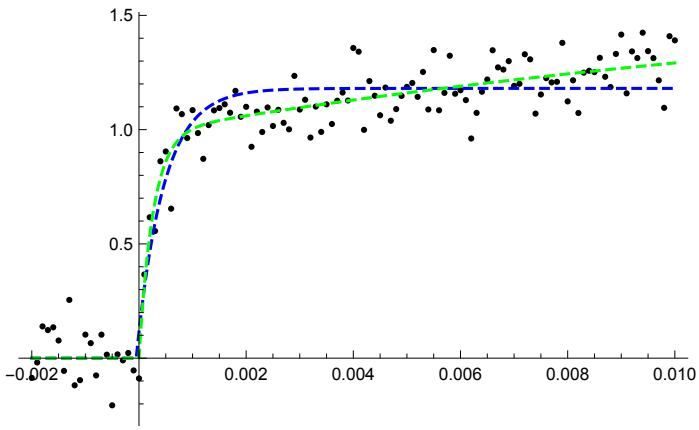


Mono: chi2 = 1.64294 d = 1.64294 a = 1.18045 t = 0.000504064

Bi: ratio chi2Mono/chi2Bi = 1.45317 d = $-8.48244 \times 10^{-19}$ a = 1.67174 a1 = 0.984168 t1 =0.00026106 t2 = 0.0168606

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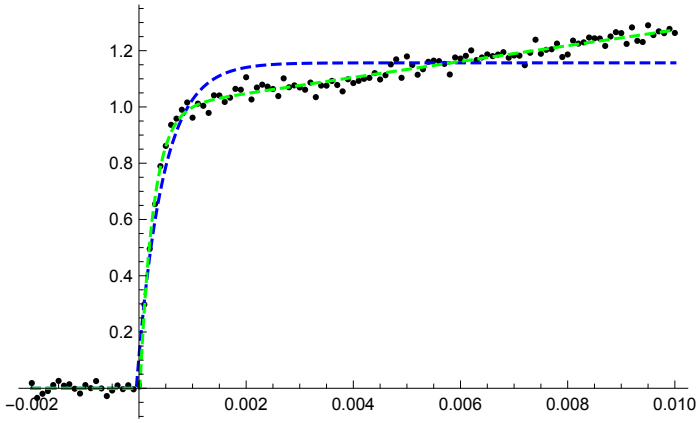


```
Mono: chi2 = 0.483918     d = 0.483918     a = 1.15673     t = 0.000481258
Bi: ratio chi2Mono/chi2Bi = 9.54188     d = 0.0000175533     a =
 7.48584     a1 = 0.990611     t1 =0.000250781     t2 = 0.224284
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----------------     Ca = 24.939
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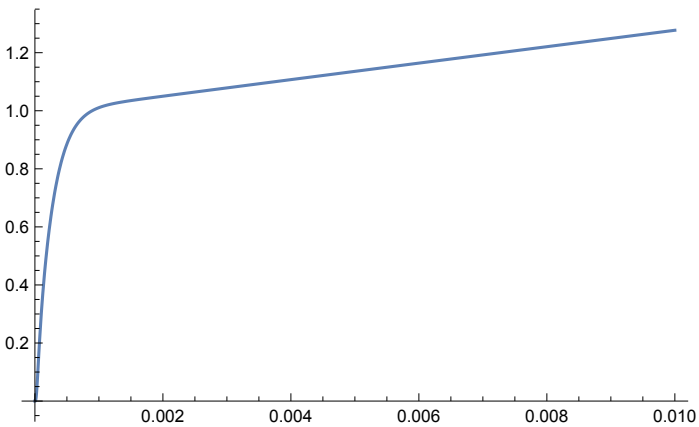

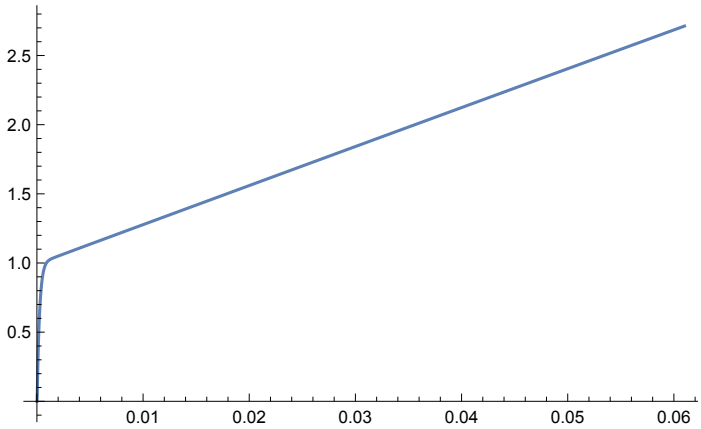


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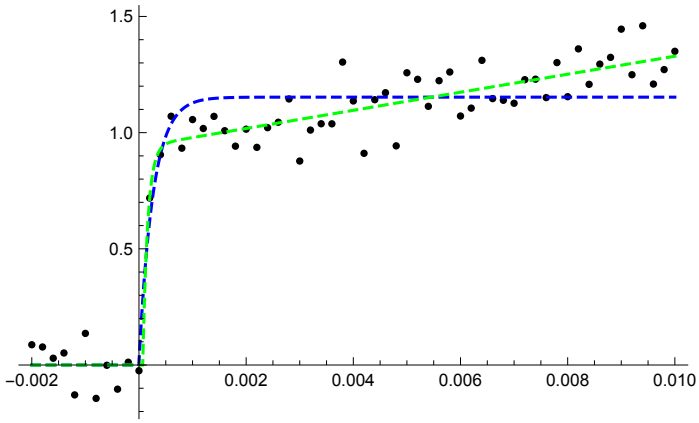


```
Mono: chi2 = 1.00087     d = 1.00087     a = 1.15271     t = 0.000261903
Bi: ratio chi2Mono/chi2Bi = 2.10015     d = 0.0000699856     a =
 24.7421     a1 = 0.942411     t1 =0.0000923133     t2 = 0.606788
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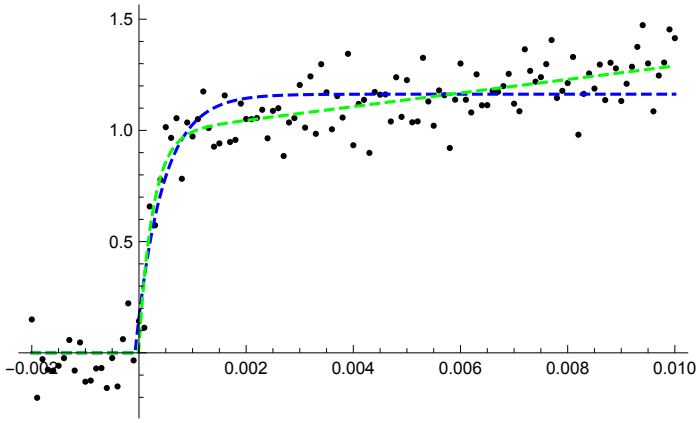


Mono: chi2 = 1.88577  d = 1.88577  a = 1.1628  t = 0.00050118

Bi: ratio chi2Mono/chi2Bi = 1.38838  d = $-8.98338 \times 10^{-6}$

a = 13.173  a1 = 0.983385  t1 =0.000262379  t2 = 0.39321

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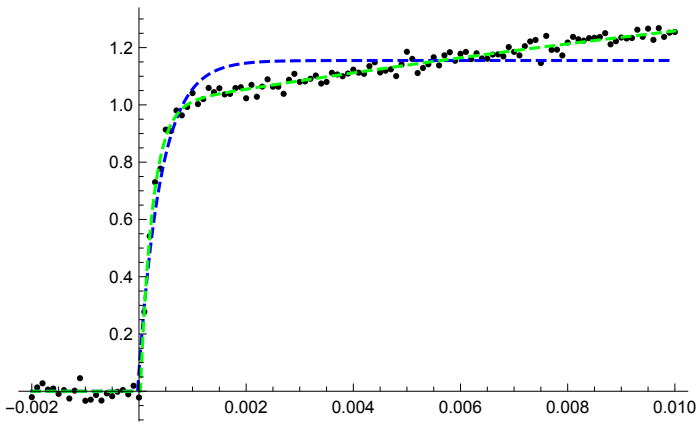

```
Mono: chi2 = 0.41797     d = 0.41797     a = 1.15501     t = 0.000418352
Bi: ratio chi2Mono/chi2Bi = 9.62337     d = 0.0000251697     a =
 1.81009     a1 = 0.99427     t1 =0.000227365     t2 = 0.0255364
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----------------     Ca = 26.2105
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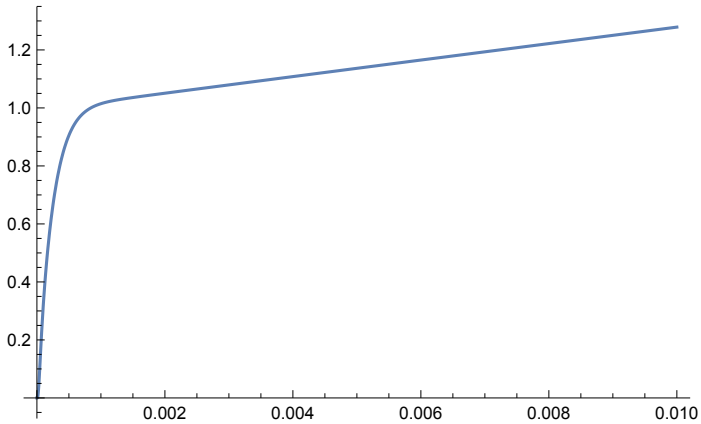


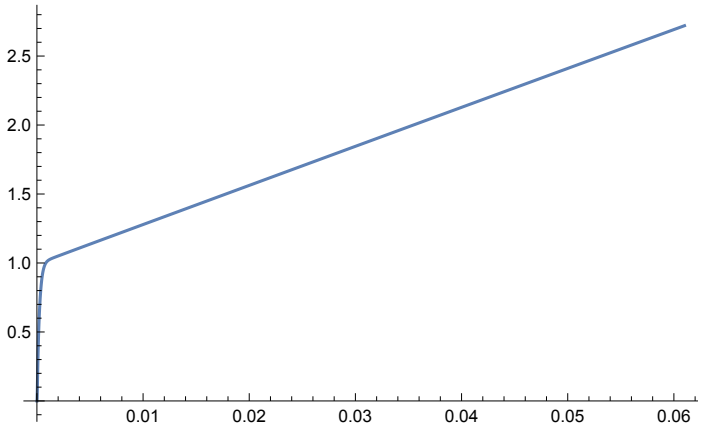


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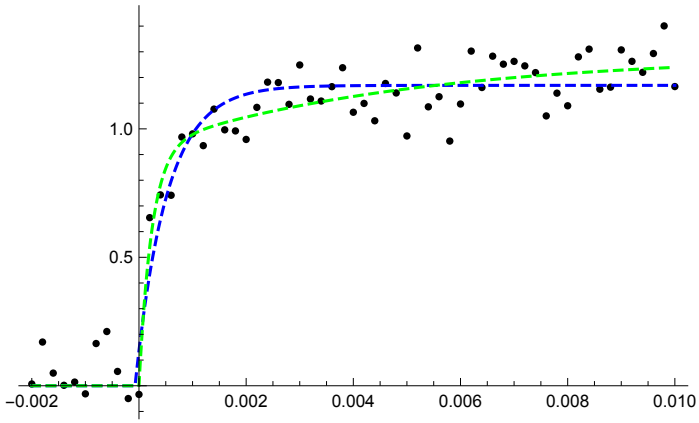


Mono: chi2 = 0.664073  d = 0.664073  a = 1.16926  t = 0.000588245

Bi: ratio chi2Mono/chi2Bi = 1.28303  d = $-1.4539 \times 10^{-17}$  a = 1.28707  a1 = 0.925079  t1 =0.000238585  t2 = 0.00493206

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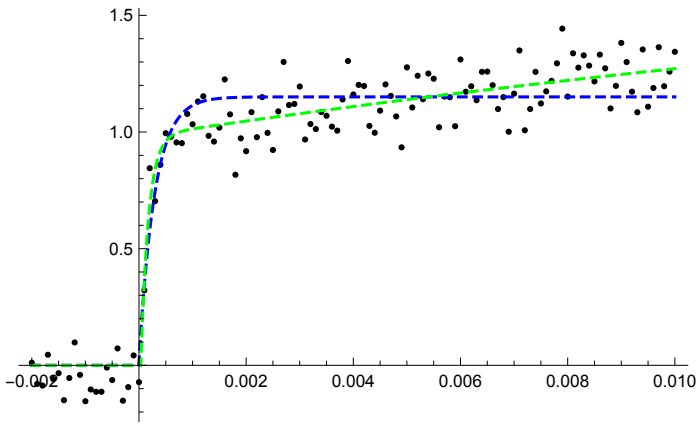


```
Mono: chi2 = 1.65561     d = 1.65561     a = 1.15057     t = 0.000291469
Bi: ratio chi2Mono/chi2Bi = 1.4543     d = 0.0000344495     a =
 1.94405     a1 = 0.981203     t1 =0.000142432     t2 = 0.0277824
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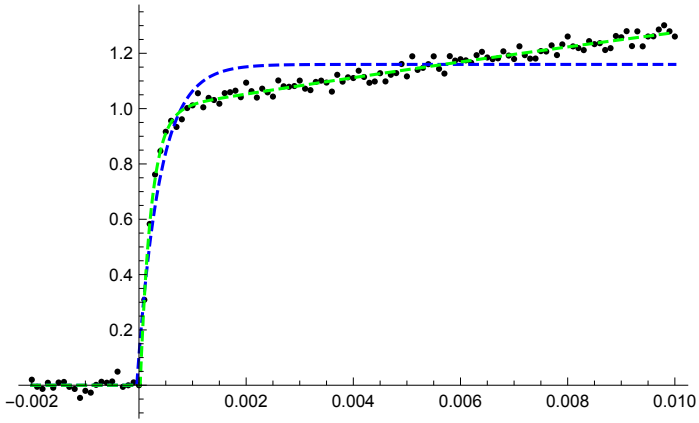


```
Mono: chi2 = 0.493841     d = 0.493841     a = 1.15977     t = 0.00041841
Bi: ratio chi2Mono/chi2Bi = 11.3101     d = 0.0000226988     a =
 2.41415     a1 = 0.991279     t1 =0.000204313     t2 = 0.0448781
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----------------     Ca = 30.4385
  uM         -------------------------------------------------------
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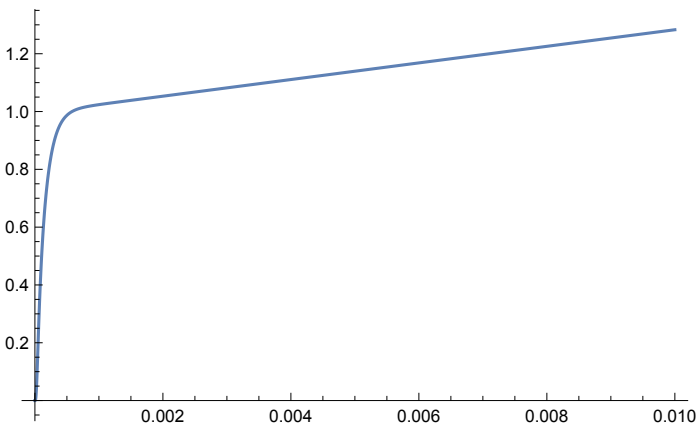

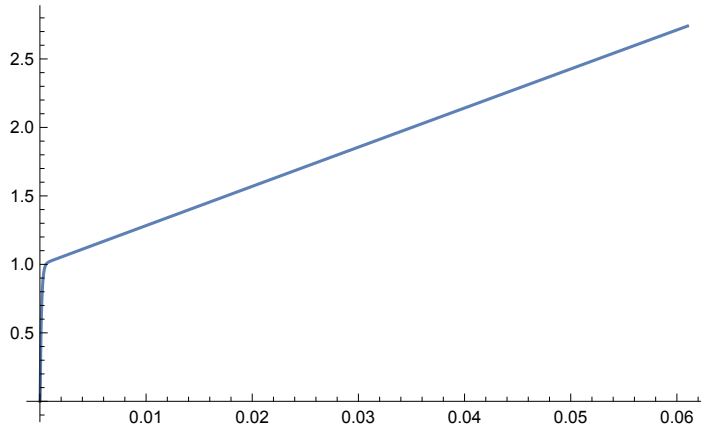


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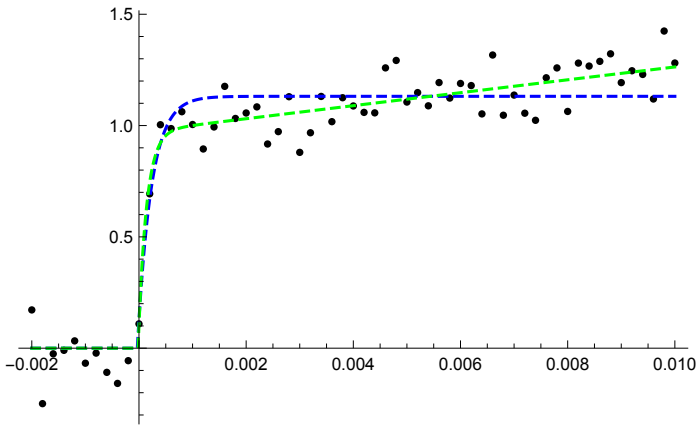


```
Mono: chi2 = 0.82103     d = 0.82103     a = 1.13136     t = 0.000257638
Bi: ratio chi2Mono/chi2Bi = 1.56028     d = -0.0000167184     a =
 11.8119     a1 = 0.971298     t1 =0.000151702     t2 = 0.36695
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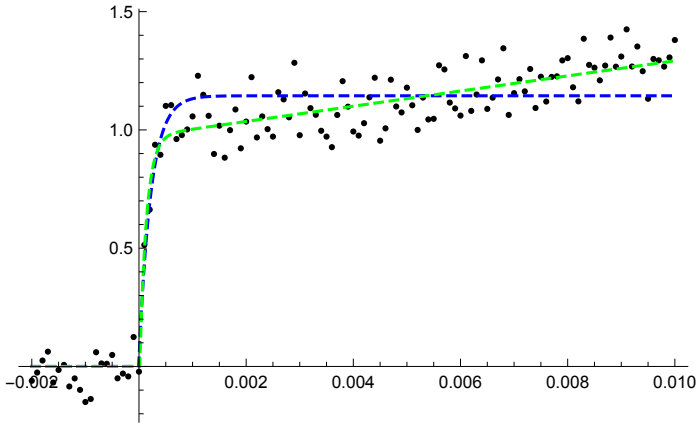


```
Mono: chi2 = 1.62711     d = 1.62711     a = 1.14425     t = 0.000222888
Bi: ratio chi2Mono/chi2Bi = 1.80035     d = 0.0000141551     a =
 16.4039     a1 = 0.971354     t1 =0.000125011     t2 = 0.475441
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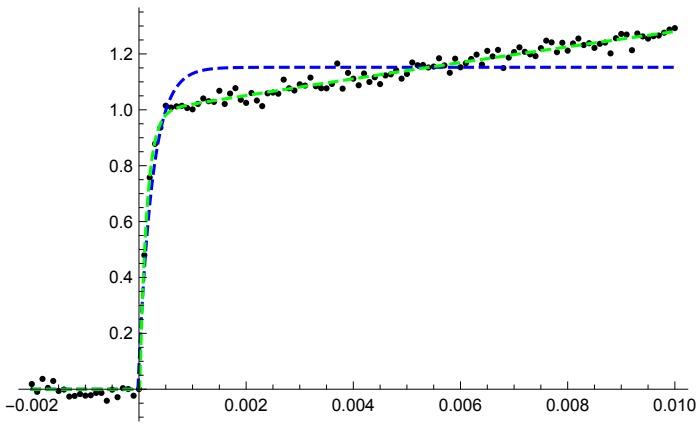

```
Mono: chi2 = 0.607561     d = 0.607561     a = 1.15215     t = 0.000258842
Bi: ratio chi2Mono/chi2Bi = 13.1178     d = 0.0000142776     a =
 3.11319     a1 = 0.990036     t1 =0.000130756     t2 = 0.0679374
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  -------------------------
----------------     Ca = 31.9006
  uM         -------------------------------------------------------
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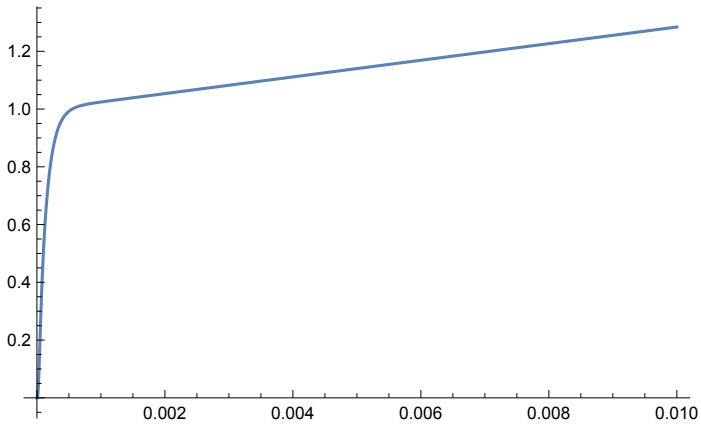


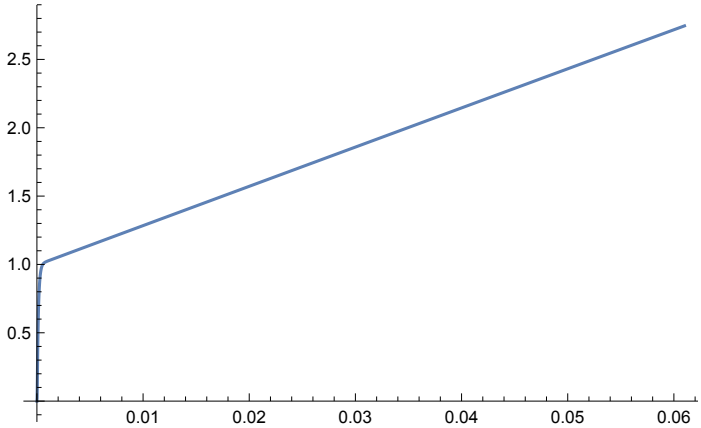


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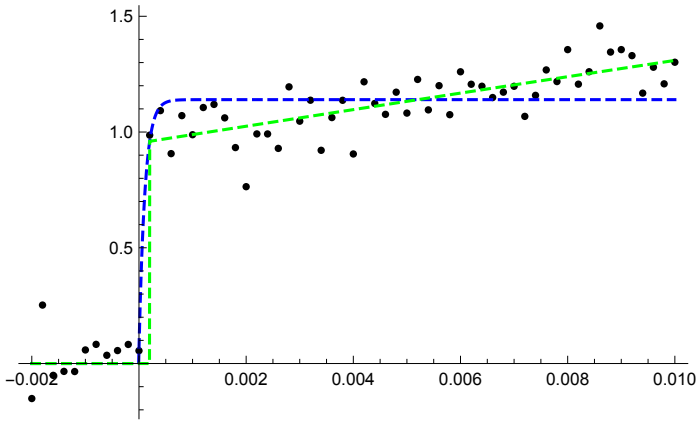


Mono: chi2 = 1.025  d = 1.025  a = 1.13985  t = 0.000111557

Bi: ratio chi2Mono/chi2Bi = 1.95257  d = 0.000199737  a = 11.4749  a1 = 0.959922  t1 = $7.0257 \times 10^{-9}$  t2 = 0.290007

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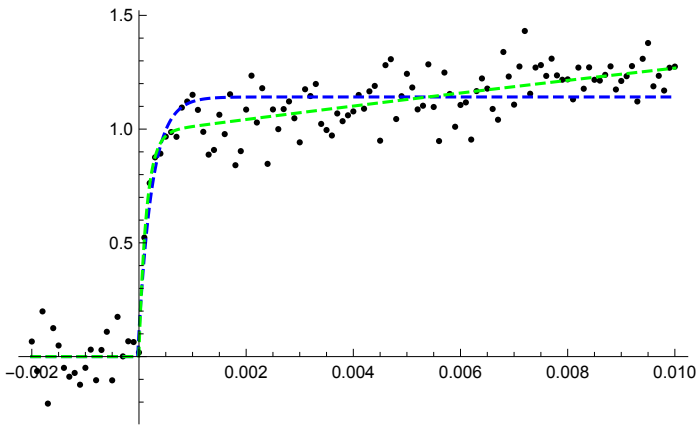


Mono: chi2 = 1.60093  d = 1.60093  a = 1.14131  t = 0.000254992

Bi: ratio chi2Mono/chi2Bi = 1.52685  d = $-3.13927 \times 10^{-6}$  a = 3.04073  a1 = 0.981337  t1 =0.000140445  t2 = 0.0666949

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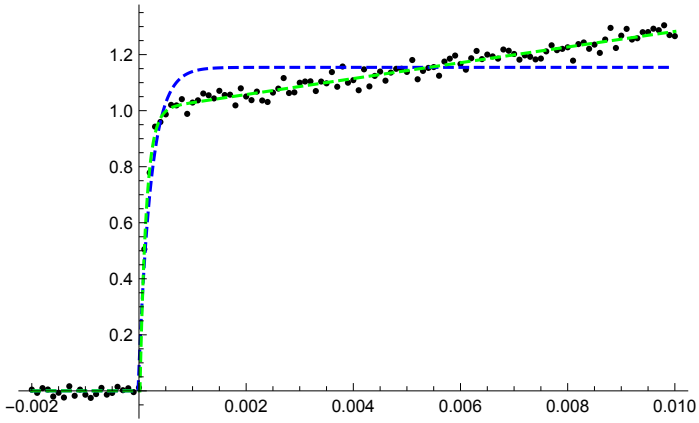


```
Mono: chi2 = 0.590964     d = 0.590964     a = 1.15455     t = 0.000233787
Bi: ratio chi2Mono/chi2Bi = 12.399     d = 0.000018303     a =
 7.60893     a1 = 1.00053     t1 =0.000117666     t2 = 0.228685
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----------------     Ca = 33.4338
  uM         -------------------------------------------------------
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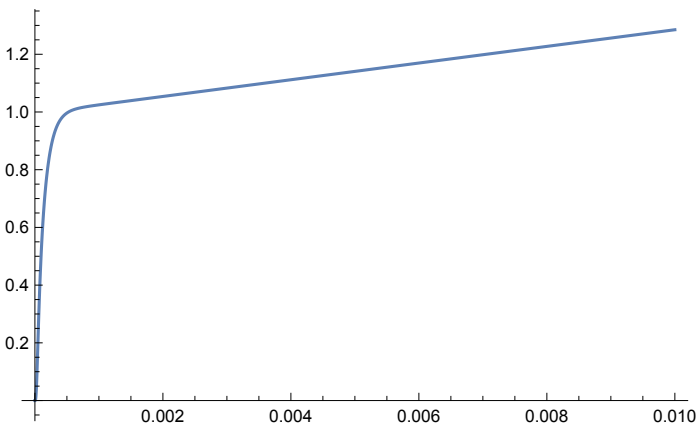

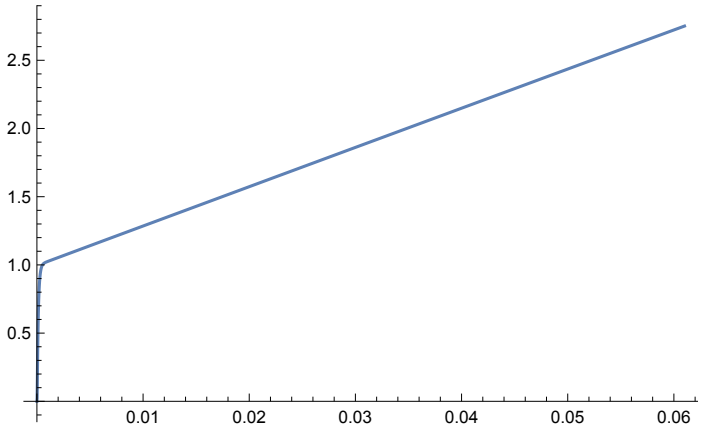


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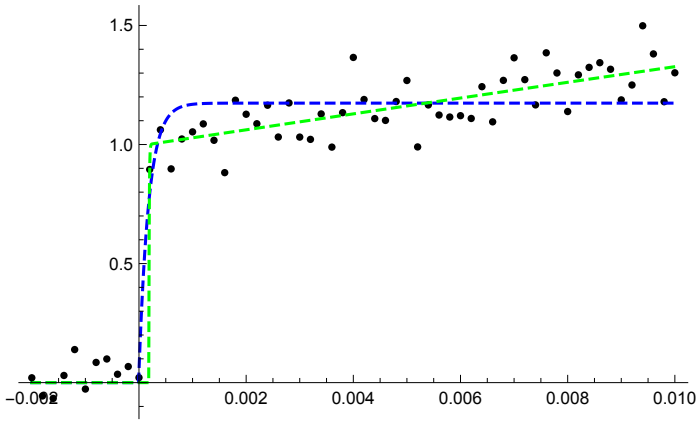


Mono: chi2 = 0.863819 d = 0.863819 a = 1.17383 t = 0.000184045

Bi: ratio chi2Mono/chi2Bi = 1.88187 d = 0.000183135 a = 11.2954 a1 = 1.00055 t1 = $7.51335 \times 10^{-6}$ t2 = 0.304712

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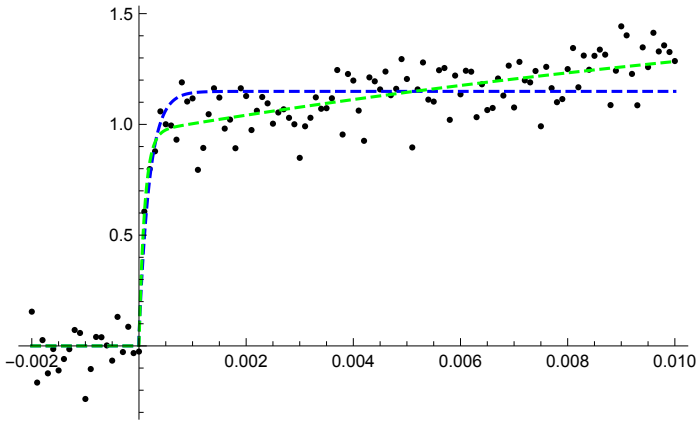


Mono: chi2 = 1.8506 d = 1.8506 a = 1.149 t = 0.000195387

Bi: ratio chi2Mono/chi2Bi = 1.6098 d = $-1.44899 \times 10^{-17}$ a = 1.73533 a1 = 0.962827 t1 =0.000105179 t2 = 0.0186097

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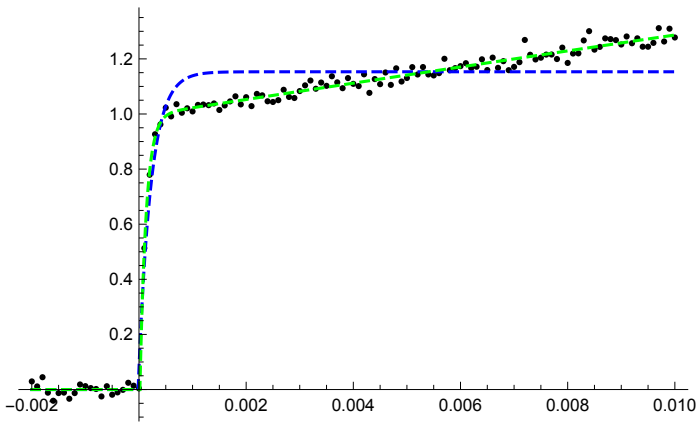

```
Mono: chi2 = 0.642743     d = 0.642743     a = 1.15318     t = 0.000232286
Bi: ratio chi2Mono/chi2Bi = 12.658     d = 0.0000174085     a =
 7.73426     a1 = 0.993203     t1 =0.000115682     t2 = 0.224281
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----------------     Ca = 35.0413
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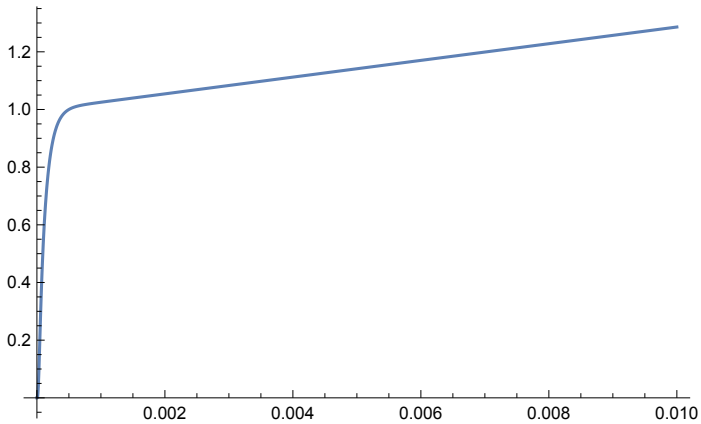


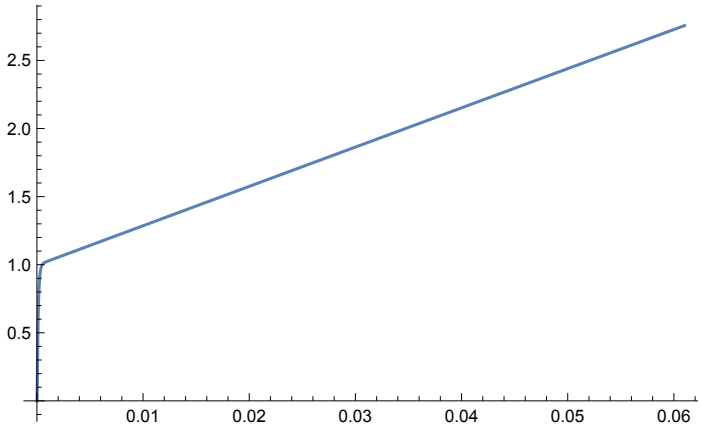


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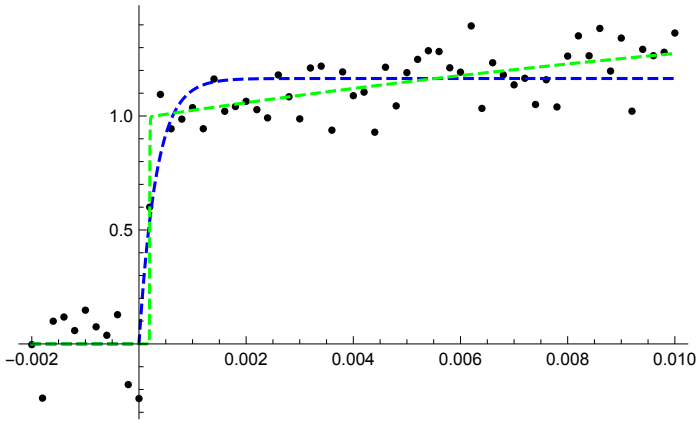


Mono: chi2 = 0.990951 d = 0.990951 a = 1.1645 t = 0.00032145

Bi: ratio chi2Mono/chi2Bi = 1.41727 d = 0.000195456 a = 1.71059 a1 = 0.996614 t1 =$4.92936 \times 10^{-6}$ t2 = 0.0199009

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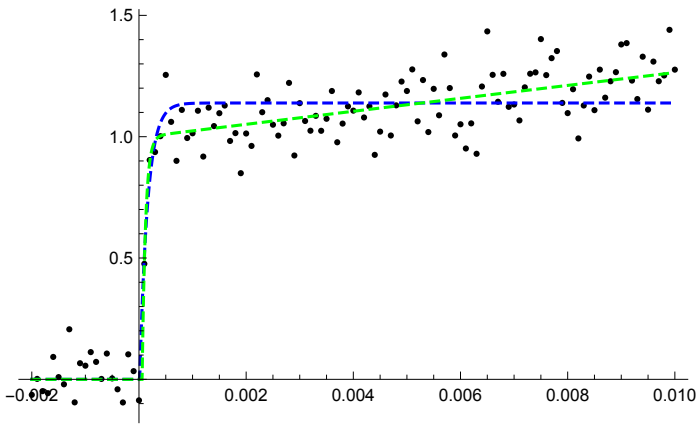


```
Mono: chi2 = 1.70897     d = 1.70897     a = 1.13887     t = 0.000147115
Bi: ratio chi2Mono/chi2Bi = 1.44748     d = 0.0000587965     a =
 11.2739     a1 = 0.998514     t1 =0.000063713     t2 = 0.379511
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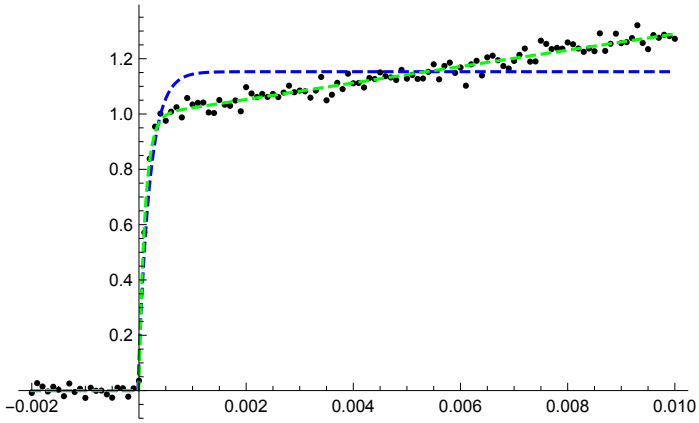


Mono: chi2 = 0.680866 d = 0.680866 a = 1.153 t = 0.000210596

Bi: ratio chi2Mono/chi2Bi = 12.198 d = $-3.48224 \times 10^{-6}$ a = 9.94158 a1 = 0.992386 t1 =0.000114258 t2 = 0.296263

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---- Ca = 36.727

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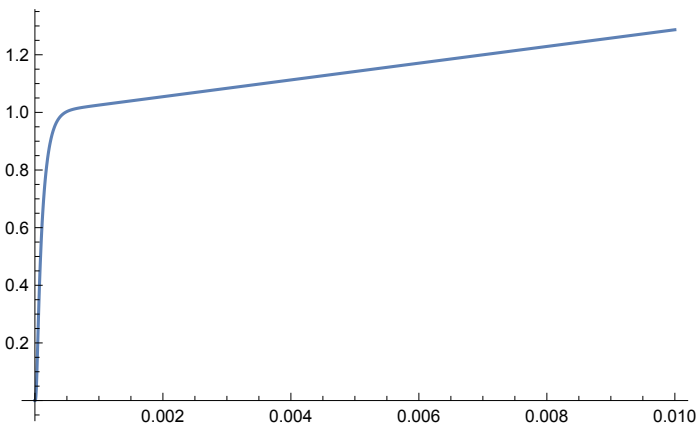

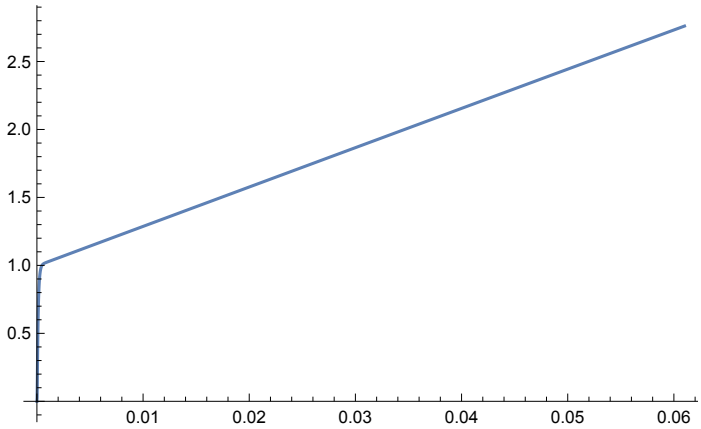


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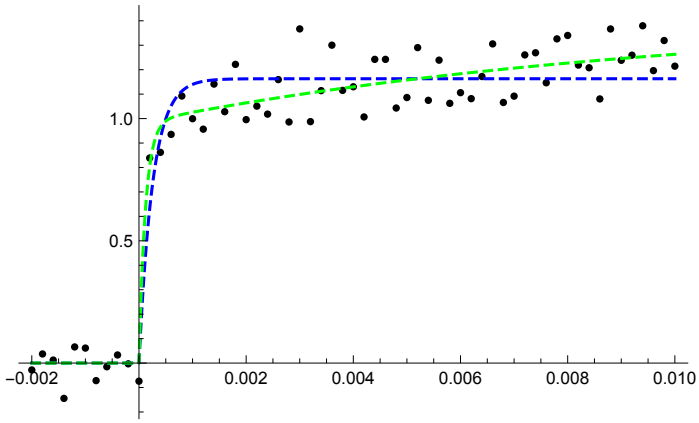


Mono: chi2 = 0.736945 d = 0.736945 a = 1.16298 t = 0.000255515

Bi: ratio chi2Mono/chi2Bi = 1.43905 d = $-4.09226 \times 10^{-19}$ a = 1.42184 a1 = 0.983889 t1 =0.000121116 t2 = 0.00987042

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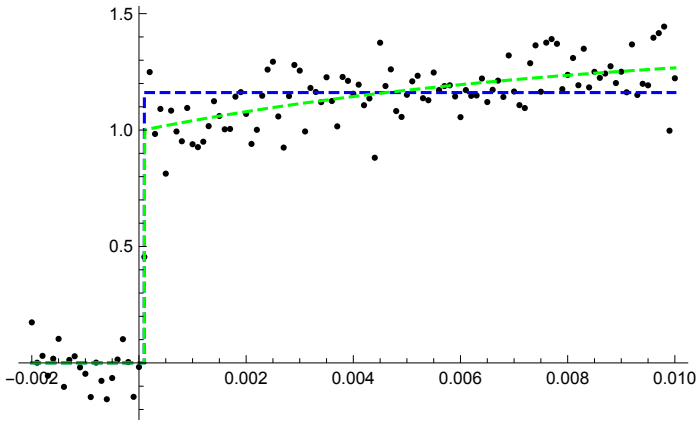


Mono: chi2 = 1.70001 d = 1.70001 a = 1.16102 t = $1.16203 \times 10^{-7}$

Bi: ratio chi2Mono/chi2Bi = 1.49627 d = 0.0000982922 a = 1.38477 a1 = 1.00098 t1 =$2.8178 \times 10^{-6}$ t2 = 0.00837652

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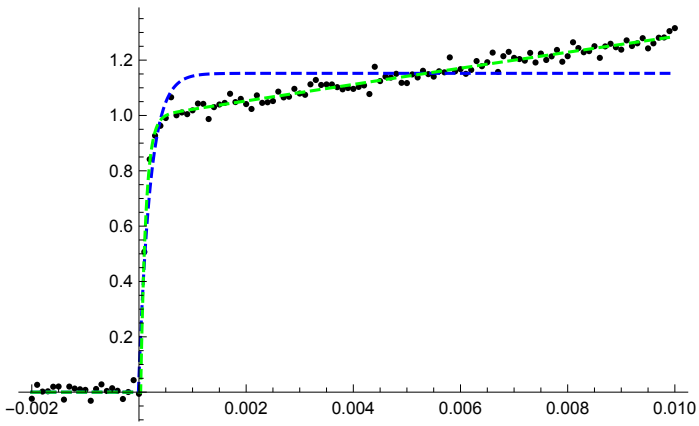

```
Mono: chi2 = 0.638335     d = 0.638335     a = 1.15226     t = 0.000212624
Bi: ratio chi2Mono/chi2Bi = 14.0248     d = 0.0000314078     a =
 4.38975     a1 = 0.992658     t1 =0.0000957705     t2 = 0.110745
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----------------     Ca = 38.4944
  uM         -------------------------------------------------------
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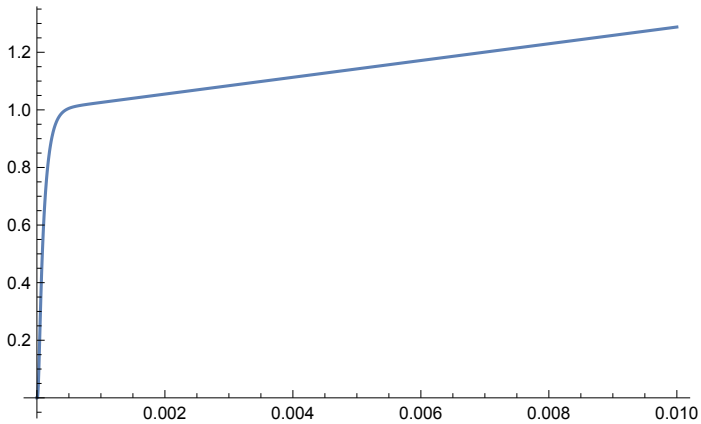


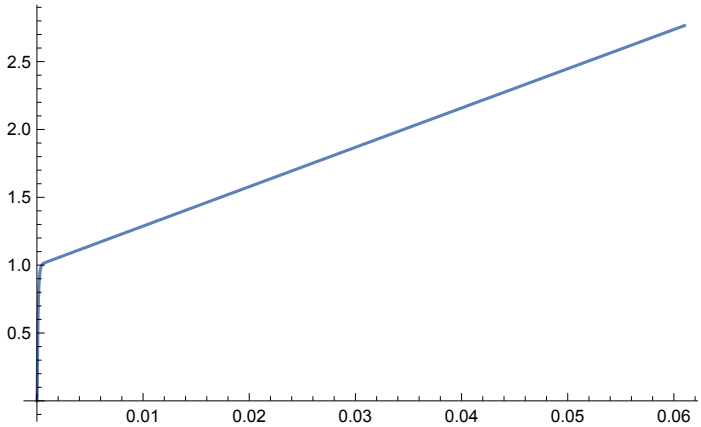


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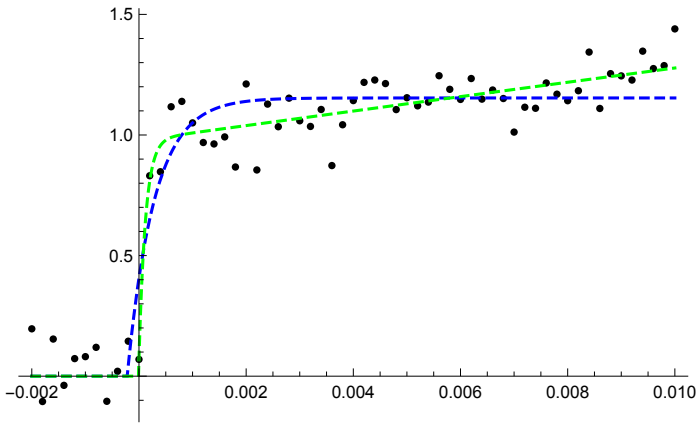


Mono: chi2 = 0.941337  d = 0.941337  a = 1.15351  t = 0.000504974

Bi: ratio chi2Mono/chi2Bi = 1.80016  d = $-9.21563 \times 10^{-6}$  a = 10.6126  a1 = 0.977991  t1 =0.000122332  t2 = 0.316678

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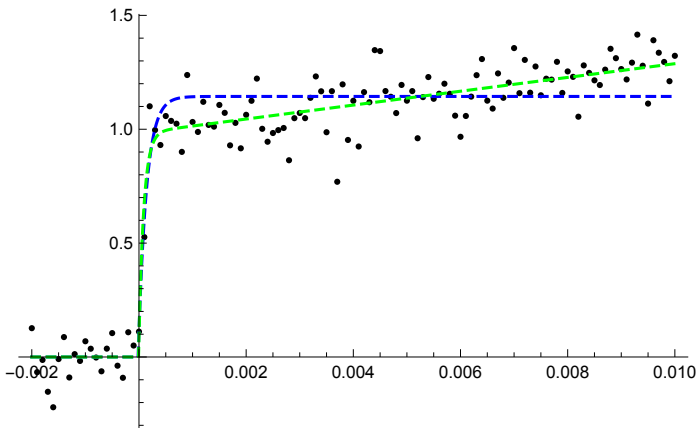


Mono: chi2 = 1.81545  d = 1.81545  a = 1.14401  t = 0.000151116

Bi: ratio chi2Mono/chi2Bi = 1.62401  d = $-8.27143 \times 10^{-6}$

a = 12.9957  a1 = 0.983  t1 =0.0000923965  t2 = 0.389349

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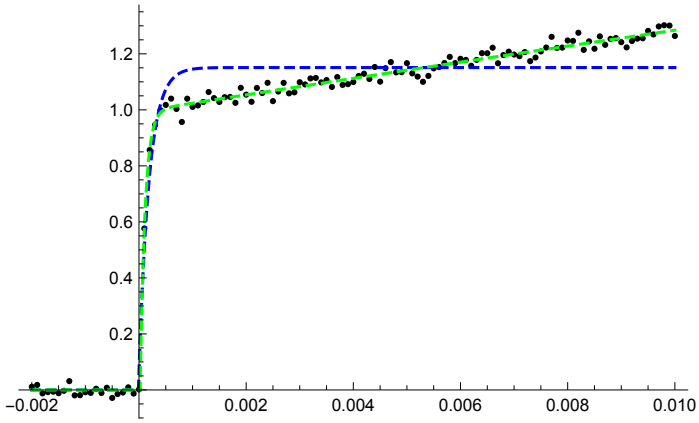


```
Mono: chi2 = 0.641227     d = 0.641227     a = 1.15096     t = 0.000189937
Bi: ratio chi2Mono/chi2Bi = 14.5333     d = 0.000020537     a =
 5.42349     a1 = 0.994506     t1 =0.0000924321     t2 = 0.147487
-------------------------------------------------------------------------------------
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----------------     Ca = 40.3477
  uM         -------------------------------------------------------
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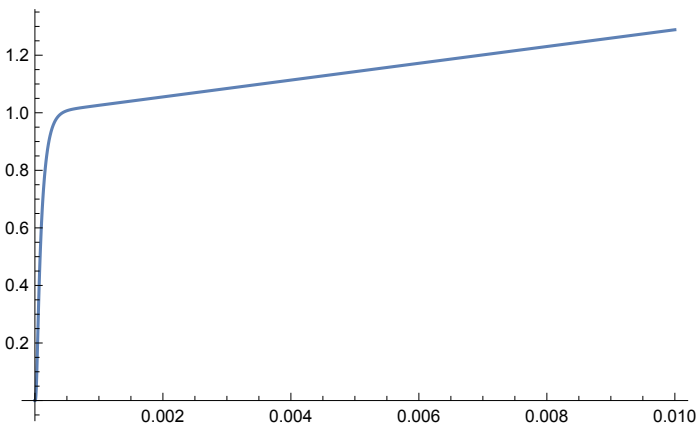

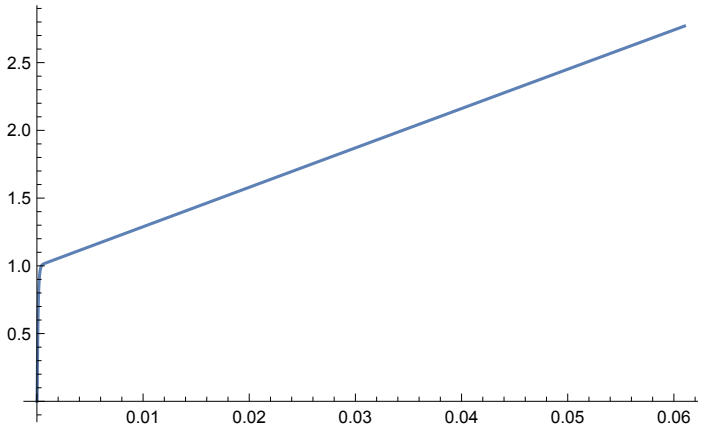


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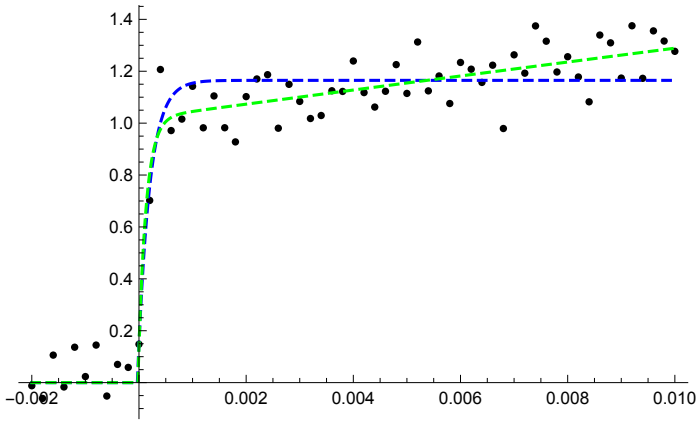


```
Mono: chi2 = 0.720385     d = 0.720385     a = 1.16487     t = 0.000219463
Bi: ratio chi2Mono/chi2Bi = 1.57246     d = -0.0000202652
      a = 8.87981     a1 = 1.01772     t1 =0.00014262     t2 = 0.285529
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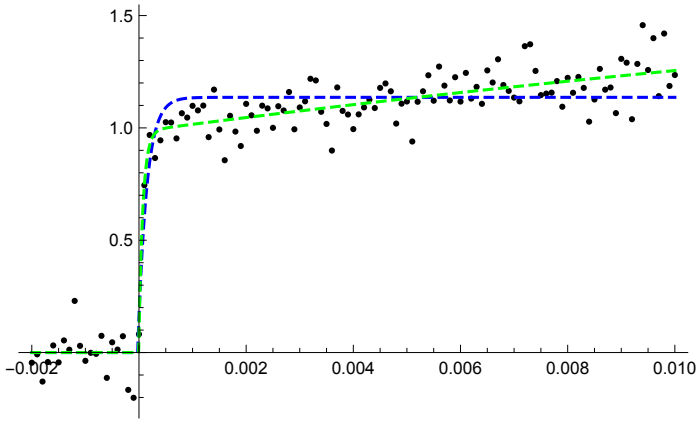


Mono: chi2 = 1.42927  d = 1.42927  a = 1.13603  t = 0.000163204

Bi: ratio chi2Mono/chi2Bi = 1.58329  d = $-6.80231 \times 10^{-6}$  a = 1.96713  a1 = 0.984567  t1 =0.0000770988  t2 = 0.0310646

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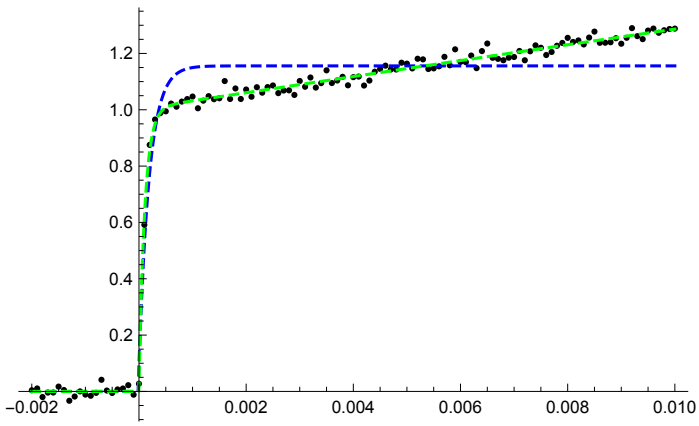

Mono: chi2 = 0.612936  d = 0.612936  a = 1.15577  t = 0.000193043

Bi: ratio chi2Mono/chi2Bi = 16.119  d = $-2.42644 \times 10^{-6}$  a = 6.3174  a1 = 1.00256  t1 =0.000108619  t2 = 0.182289

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---------- Ca = 42.2911 uM ----------

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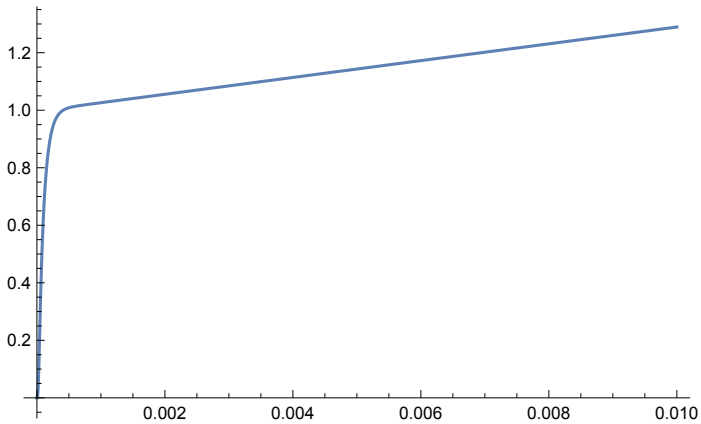


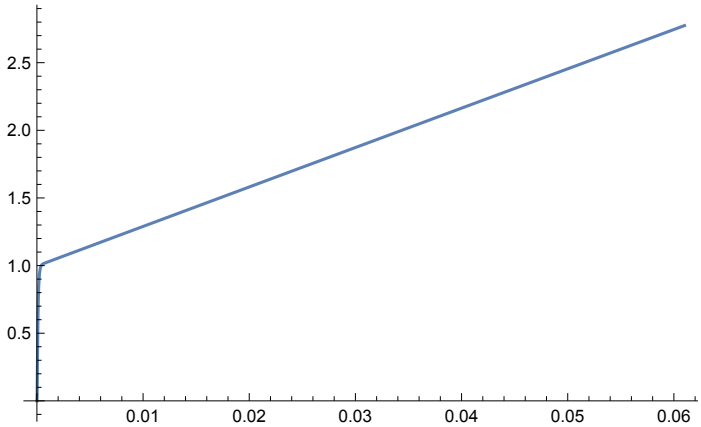


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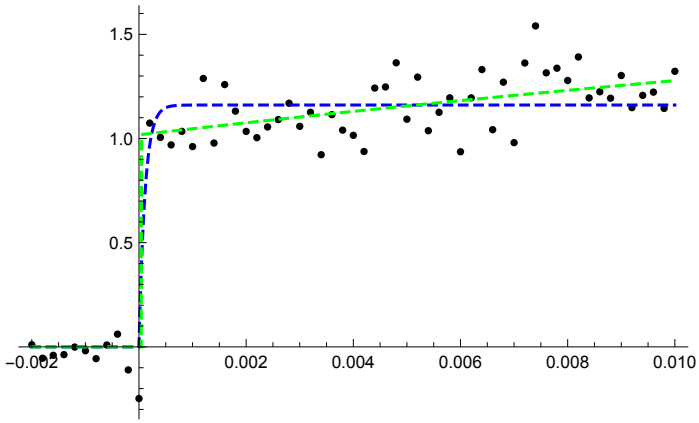


Mono: chi2 = 1.07701 d = 1.07701 a = 1.16075 t = 0.000111799

Bi: ratio chi2Mono/chi2Bi = 1.34057 d = 0.0000439618 a = 2.12662 a1 = 1.01902 t1 =$1.19765 \times 10^{-6}$ t2 = 0.0374104

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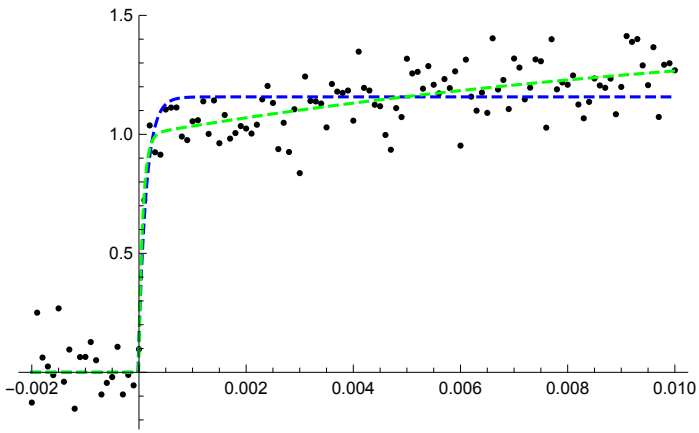


Mono: chi2 = 1.72174 d = 1.72174 a = 1.15746 t = 0.000143344

Bi: ratio chi2Mono/chi2Bi = 1.43188 d = $-7.44446 \times 10^{-6}$ a = 1.48352 a1 = 0.996776 t1 =0.0000761977 t2 = 0.0123794

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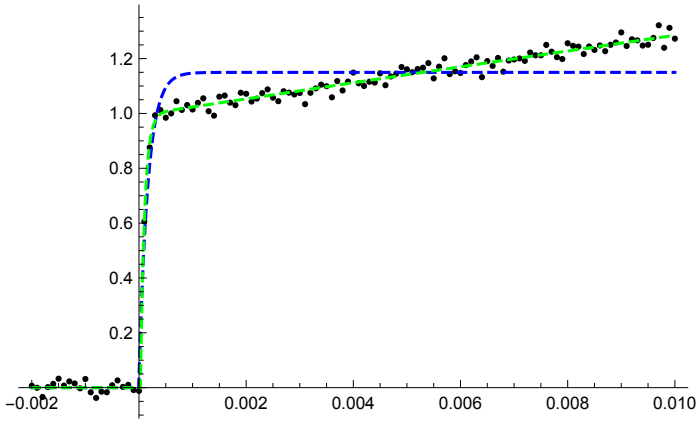


```
Mono: chi2 = 0.661739     d = 0.661739     a = 1.14971     t = 0.000166948
Bi: ratio chi2Mono/chi2Bi = 13.2295     d = 0.0000269386     a =
 7.20502     a1 = 0.994611     t1 =0.0000786754     t2 = 0.208317
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----------------     Ca = 44.3291
  uM         -------------------------------------------------------
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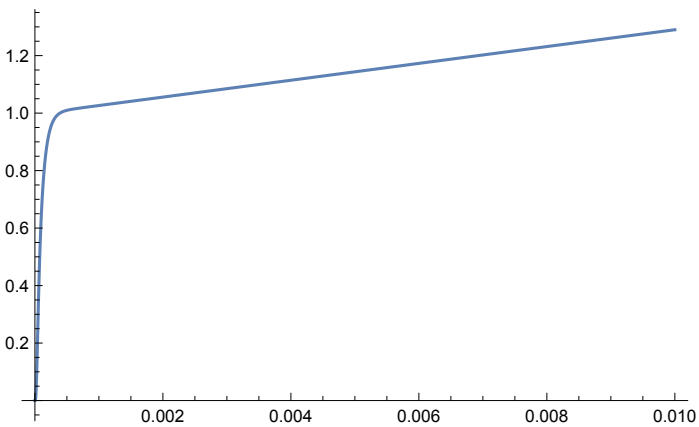

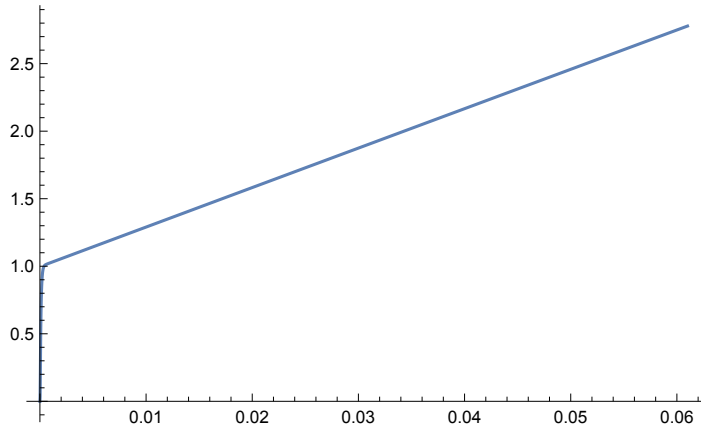


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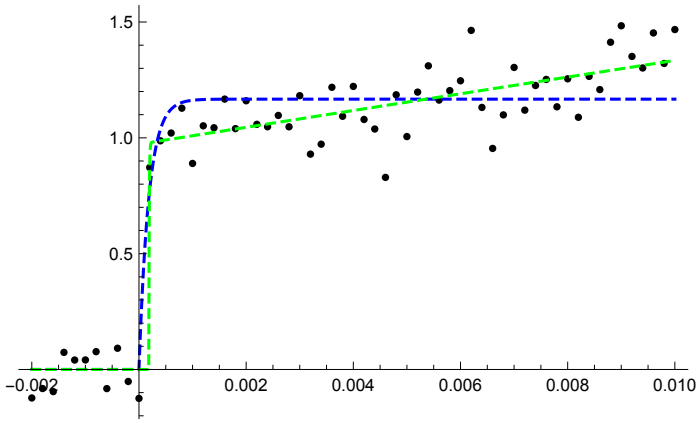


Mono: chi2 = 1.17114 d = 1.17114 a = 1.16701 t = 0.000182559

Bi: ratio chi2Mono/chi2Bi = 1.68935 d = 0.000183048 a = 21.9314 a1 = 0.979235 t1 = $7.69106 \times 10^{-6}$ t2 = 0.574648

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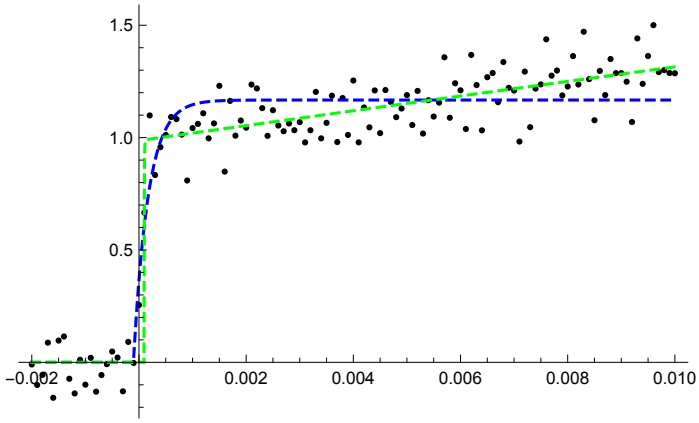


Mono: chi2 = 1.90358 d = 1.90358 a = 1.16714 t = 0.000274056

Bi: ratio chi2Mono/chi2Bi = 1.57945 d = 0.0000951719 a = 10.6469 a1 = 0.989924 t1 = $4.32244 \times 10^{-6}$ t2 = 0.28953

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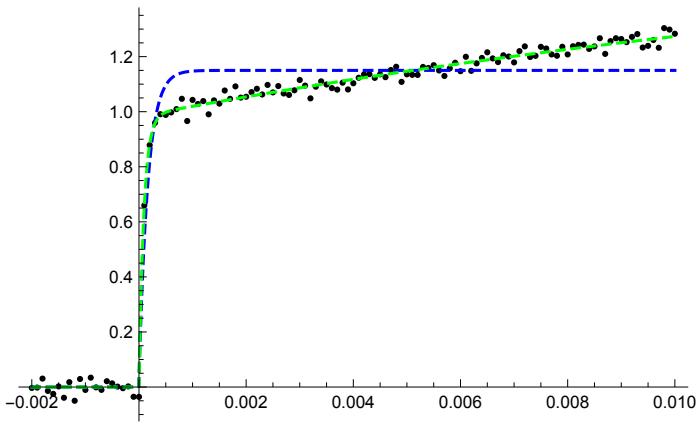

Mono: chi2 = 0.646361 d = 0.646361 a = 1.14999 t = 0.000164926

Bi: ratio chi2Mono/chi2Bi = 13.179 d = $1.23082 \times 10^{-17}$ a = 1.70464 a1 = 0.983376 t1 =0.0000911409 t2 = 0.0194552

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---------- Ca = 46.4665

uM ----------

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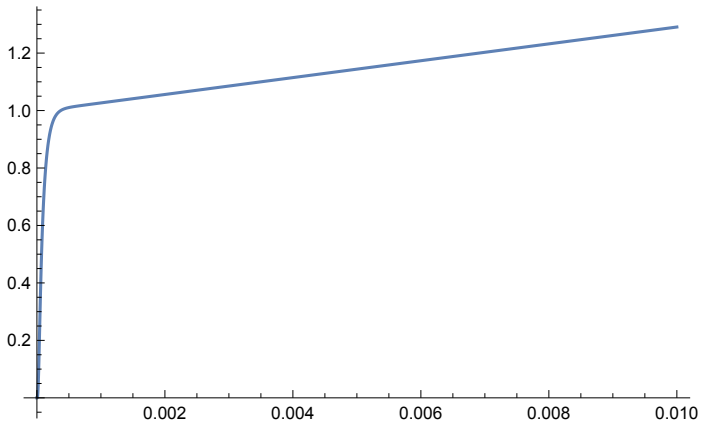


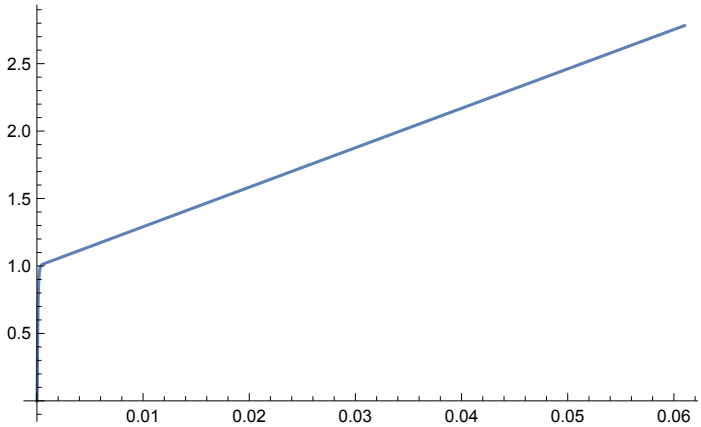


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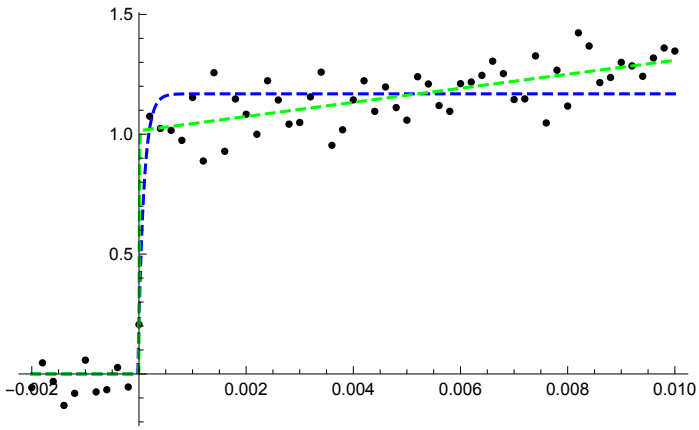


Mono: chi2 = 0.782467 d = 0.782467 a = 1.16855 t = 0.000105312

Bi: ratio chi2Mono/chi2Bi = 1.7932 d = $-1.82634 \times 10^{-6}$ a = 11.6907 a1 = 1.01464 t1 = $8.04002 \times 10^{-6}$ t2 = 0.358617

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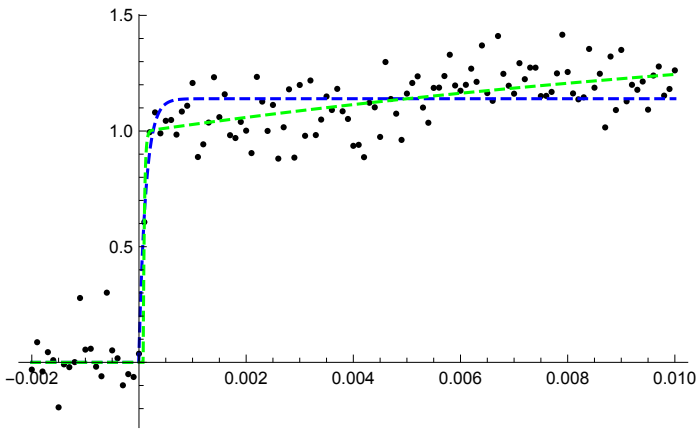


```
Mono: chi2 = 1.71001     d = 1.71001     a = 1.13972     t = 0.000127855
Bi: ratio chi2Mono/chi2Bi = 1.36731     d = 0.000078211     a =
 1.53193     a1 = 0.998507     t1 =0.0000233608     t2 = 0.0160218
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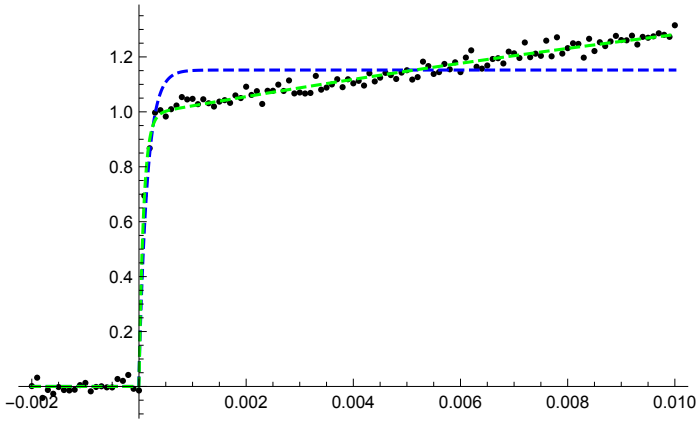


Mono: chi2 = 0.666395  d = 0.666395  a = 1.15219  t = 0.000154951

Bi: ratio chi2Mono/chi2Bi = 13.973  d = $2.14294 \times 10^{-19}$  a = 1.92495  a1 = 0.987343  t1 =0.0000851456  t2 = 0.0265897

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---  Ca = 48.7083

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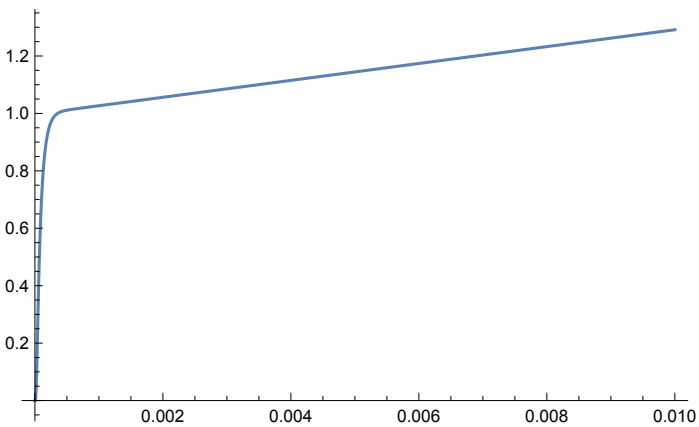

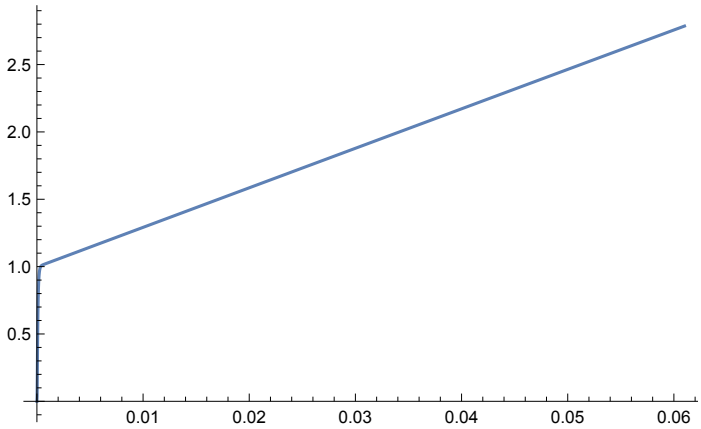


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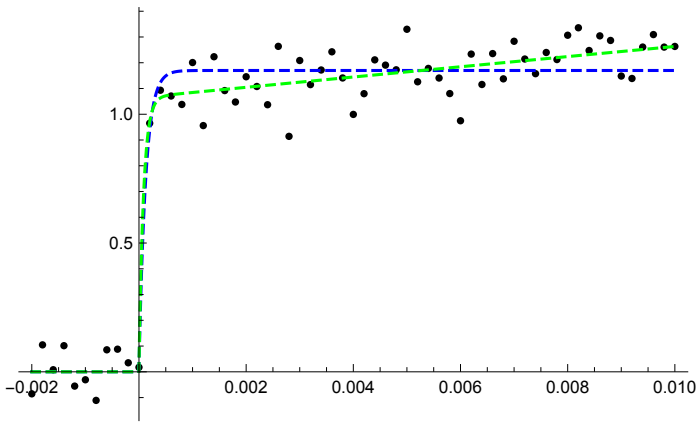


Mono: chi2 = 0.54329 d = 0.54329 a = 1.16992 t = 0.000125111

Bi: ratio chi2Mono/chi2Bi = 1.37749 d = $-1.37615 \times 10^{-6}$ a = 7.77646 a1 = 1.06429 t1 =0.0000844266 t2 = 0.33248

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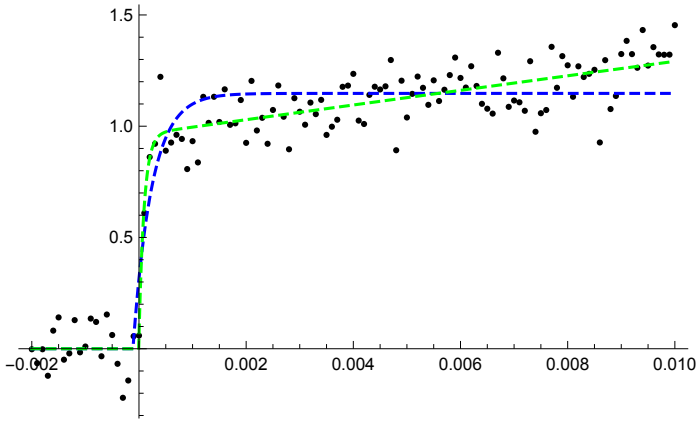


Mono: chi2 = 2.04793  d = 2.04793  a = 1.14745  t = 0.000350268

Bi: ratio chi2Mono/chi2Bi = 1.64224  d = $-5.12155 \times 10^{-6}$  a = 11.4563  a1 = 0.962373  t1 =0.0000957805  t2 = 0.31392

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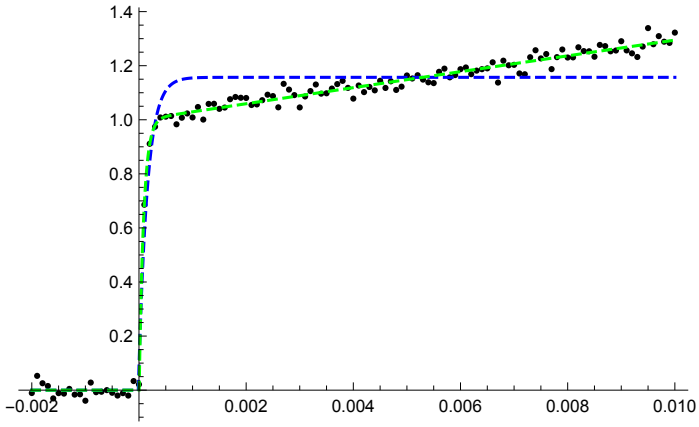

Mono: chi2 = 0.696415  d = 0.696415  a = 1.15695  t = 0.000162679

Bi: ratio chi2Mono/chi2Bi = 12.0793  d = $3.2366 \times 10^{-6}$  a = 8.76298  a1 = 0.999384  t1 =0.0000840851  t2 = 0.257861

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---  Ca = 51.0599

uM  ---

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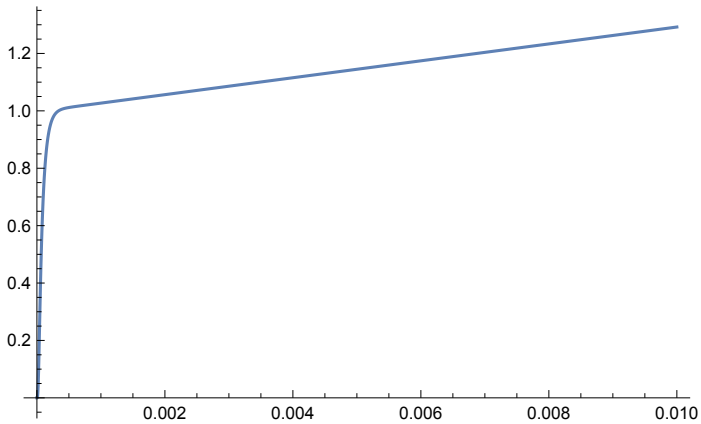


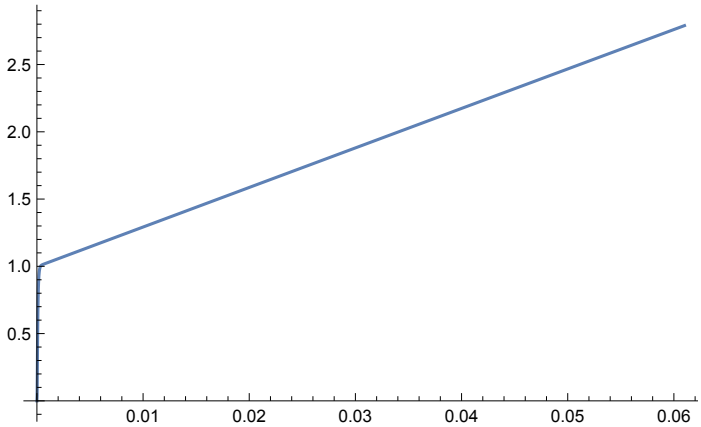


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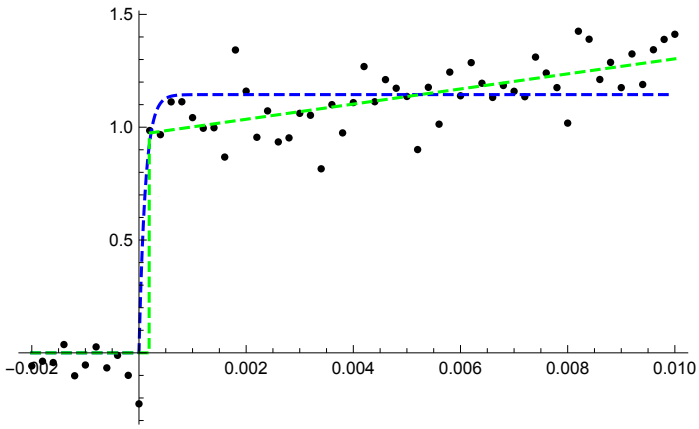


Mono: chi2 = 1.11641  d = 1.11641  a = 1.1445  t = 0.00011823

Bi: ratio chi2Mono/chi2Bi = 1.63596  d = 0.000191566  a = 18.9731  a1 = 0.974067  t1 = $2.72215 \times 10^{-7}$  t2 = 0.53188

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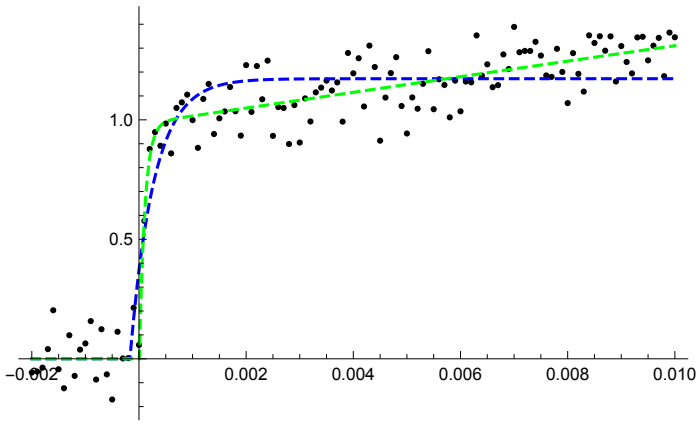


Mono: chi2 = 1.79147 d = 1.79147 a = 1.17204 t = 0.000445606

Bi: ratio chi2Mono/chi2Bi = 1.61836 d = $7.43211 \times 10^{-6}$ a = 11.0217 a1 = 0.983203 t1 =0.000102383 t2 = 0.301664

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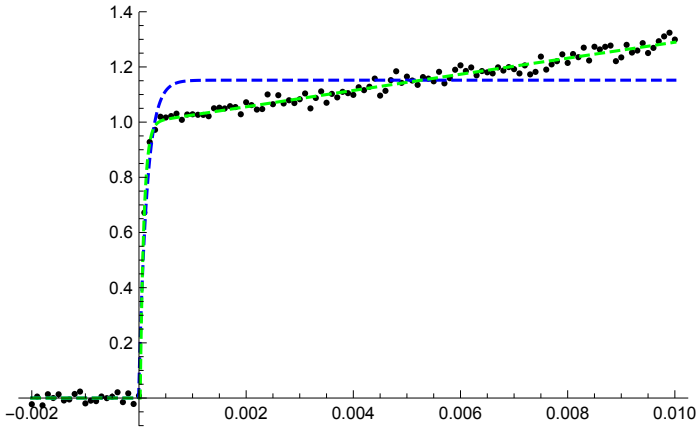


```
Mono: chi2 = 0.67148     d = 0.67148     a = 1.15202     t = 0.000149234
Bi: ratio chi2Mono/chi2Bi = 17.9753     d = 0.0000223789     a =
 8.41007     a1 = 0.996501     t1 =0.000069569     t2 = 0.247423
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----------------     Ca = 53.5266
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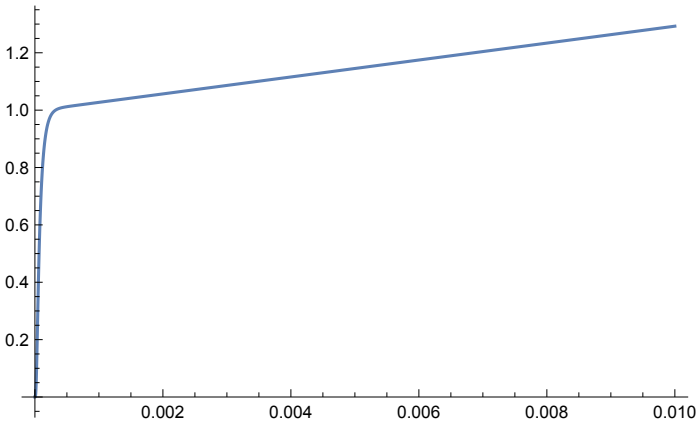

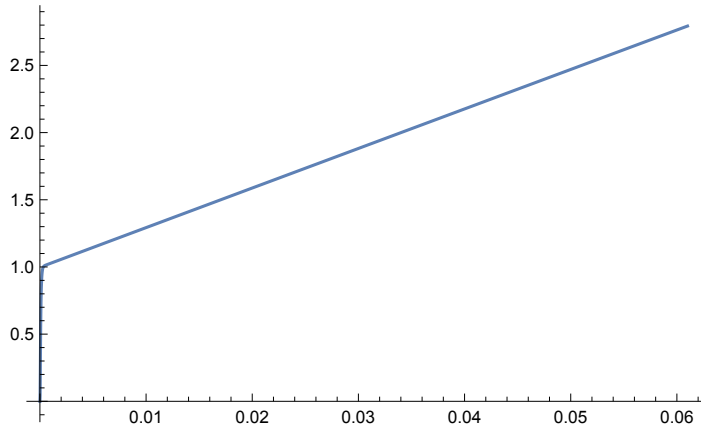


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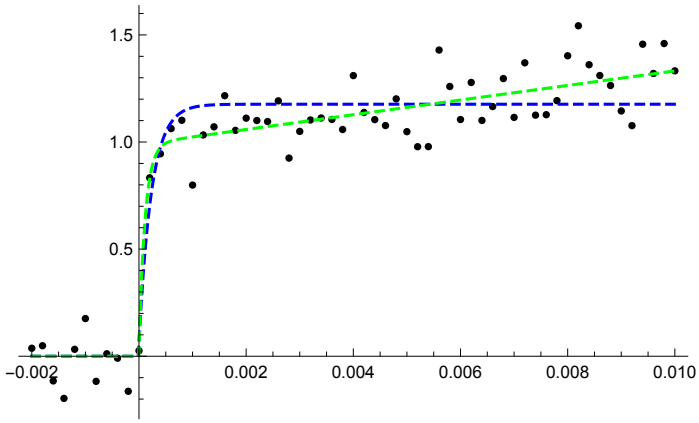


Mono: chi2 = 1.19358 d = 1.19358 a = 1.17644 t = 0.000233954

Bi: ratio chi2Mono/chi2Bi = 1.53043 d = $-3.0246 \times 10^{-6}$ a = 12.539 a1 = 0.989077 t1 =0.000114262 t2 = 0.332067

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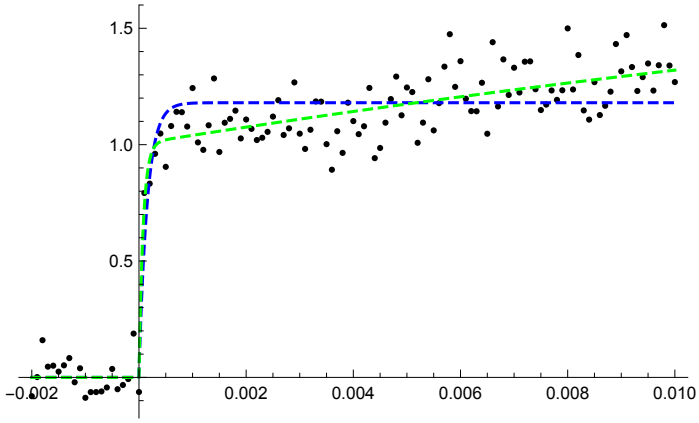


Mono: chi2 = 1.96118  d = 1.96118  a = 1.18017  t = 0.000155072

Bi: ratio chi2Mono/chi2Bi = 1.59112  d = $-1.29138 \times 10^{-17}$  a = 2.15135  a1 = 1.00367  t1 =0.0000773577  t2 = 0.0310017

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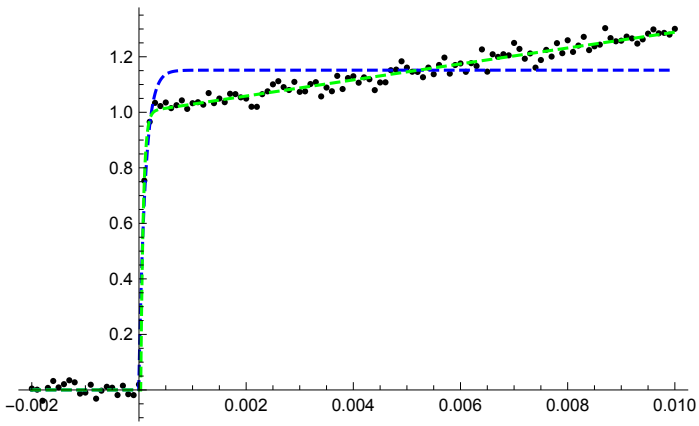

```
Mono: chi2 = 0.683169     d = 0.683169     a = 1.15169     t = 0.000116566
Bi: ratio chi2Mono/chi2Bi = 12.8579     d = 0.0000323573     a =
 9.13719     a1 = 1.00092     t1 =0.0000487063     t2 = 0.276997
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----------------     Ca = 56.1157
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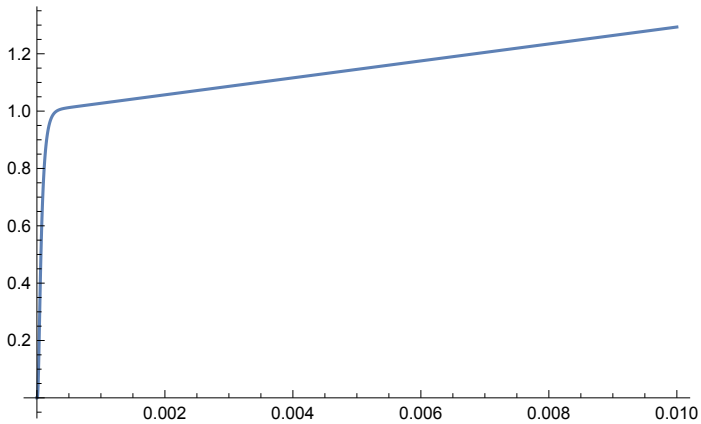


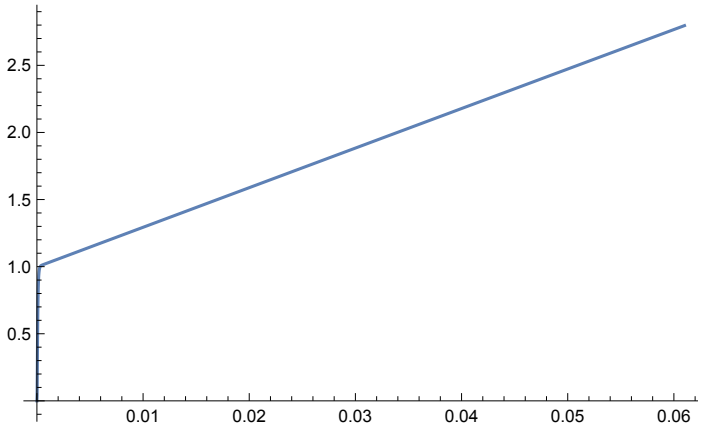


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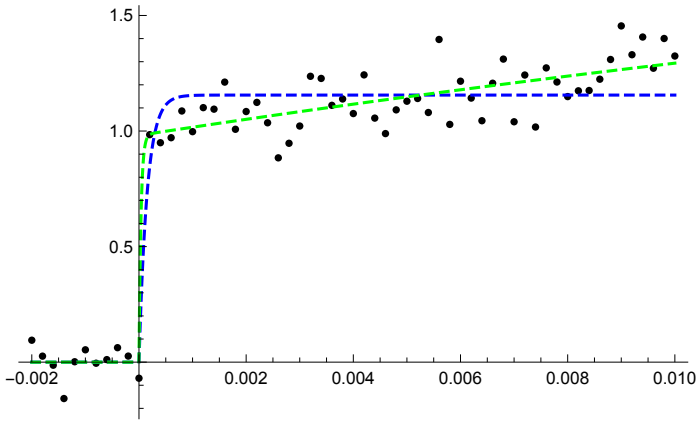


Mono: chi2 = 0.888307  d = 0.888307  a = 1.15555  t = 0.000151838

Bi: ratio chi2Mono/chi2Bi = 1.68837  d = $-2.10885 \times 10^{-17}$  a = 2.33107  a1 = 0.981451  t1 =0.0000373838  t2 = 0.0380086

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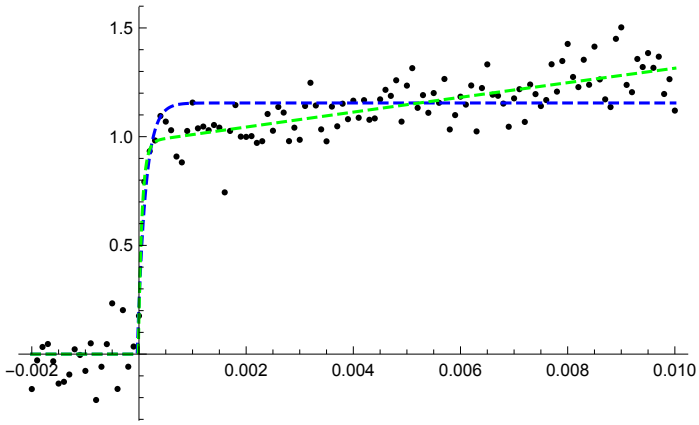


```
Mono: chi2 = 1.9069     d = 1.9069     a = 1.15495     t = 0.000149285
Bi: ratio chi2Mono/chi2Bi = 1.84884     d = -0.0000133321     a =
 7.23193     a1 = 0.974221     t1 =0.0000675192     t2 = 0.178938
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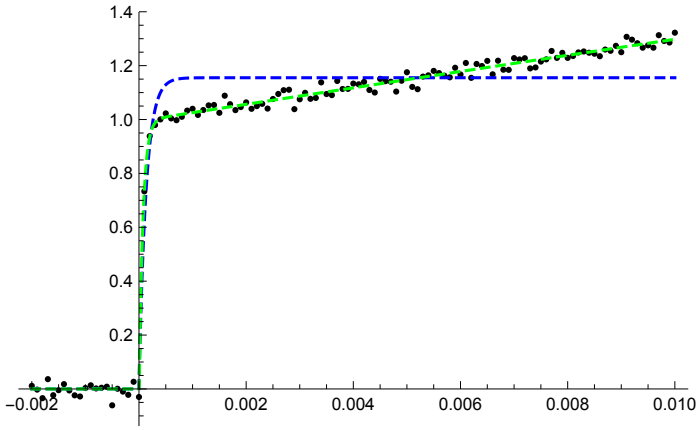


Mono: chi2 = 0.735472  d = 0.735472  a = 1.15512  t = 0.000132403

Bi: ratio chi2Mono/chi2Bi = 16.157  d = $3.803 \times 10^{-6}$  a = 7.56857  a1 = 0.994722  t1 =0.0000724872  t2 = 0.211765

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---  Ca = 58.8318

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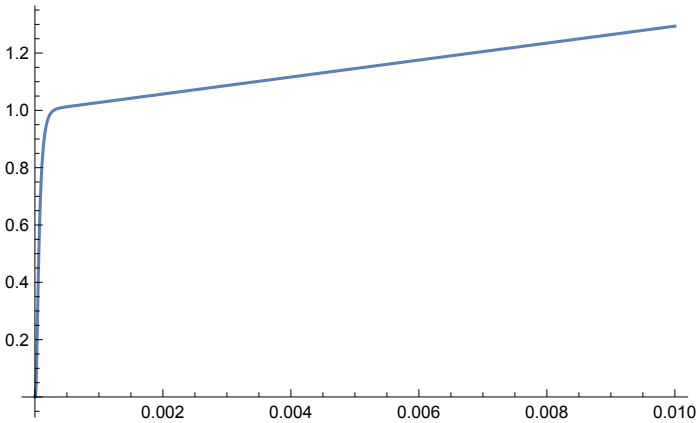

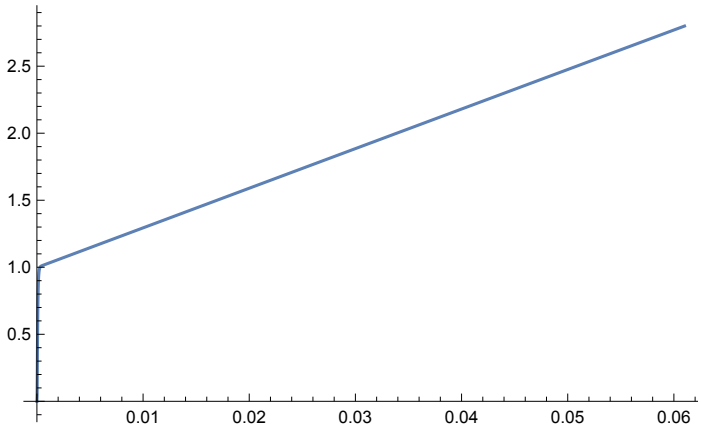


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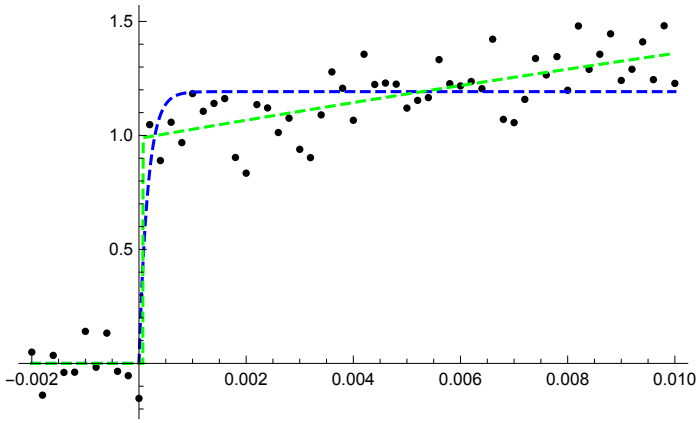


Mono: chi2 = 1.21813  d = 1.21813  a = 1.19206  t = 0.000163073

Bi: ratio chi2Mono/chi2Bi = 1.79872  d = 0.0000734265  a = 3.24977  a1 = 0.989599  t1 = $1.43835 \times 10^{-6}$  t2 = 0.0554655

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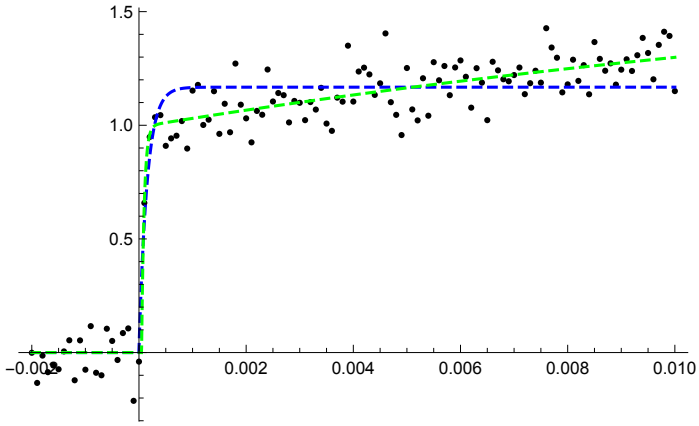


```
Mono: chi2 = 1.6382     d = 1.6382     a = 1.16761     t = 0.000150617
Bi: ratio chi2Mono/chi2Bi = 1.69264     d = 0.0000483561     a =
 1.78022     a1 = 0.994453     t1 =0.0000479555     t2 = 0.020311
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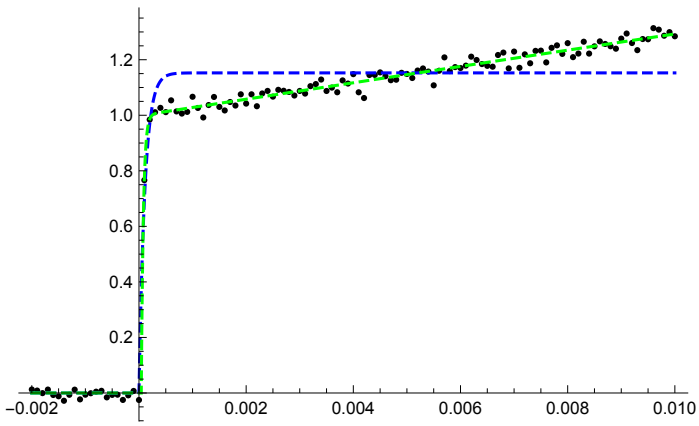

```
Mono: chi2 = 0.704995     d = 0.704995     a = 1.15257     t = 0.0001094
Bi: ratio chi2Mono/chi2Bi = 15.2258     d = 0.0000427333     a =
 12.3736     a1 = 0.999551     t1 =0.0000395691     t2 = 0.381324
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----------------     Ca = 61.6839
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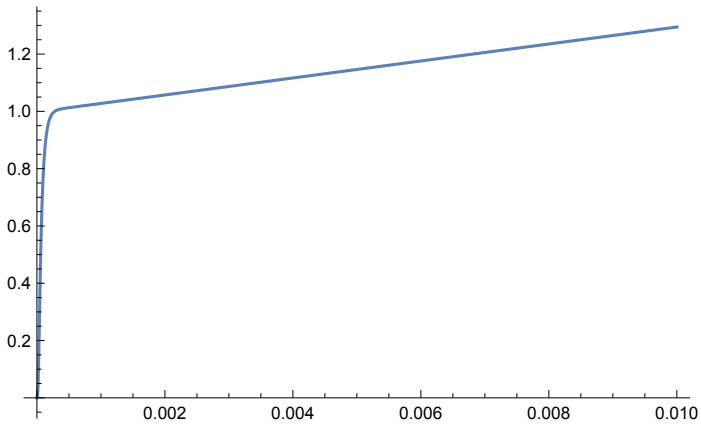


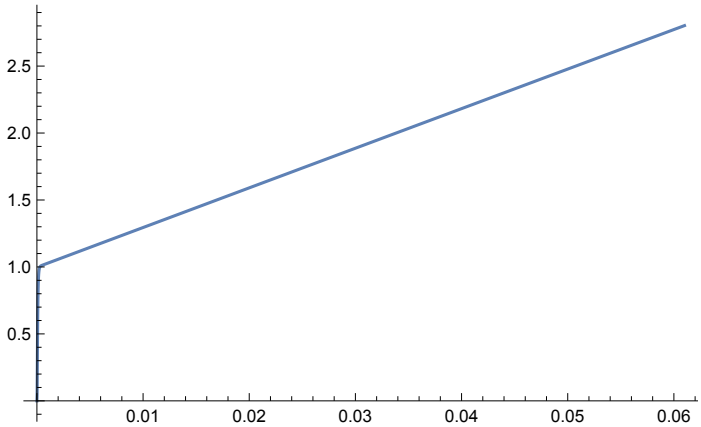


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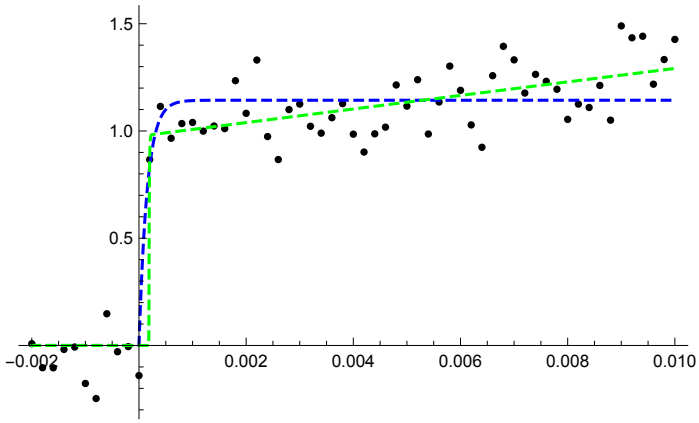


Mono: chi2 = 1.28693  d = 1.28693  a = 1.14333  t = 0.000153028

Bi: ratio chi2Mono/chi2Bi = 1.42829  d = 0.000184495  a = 18.7275  a1 = 0.981256  t1 = $7.23694 \times 10^{-6}$  t2 = 0.556522

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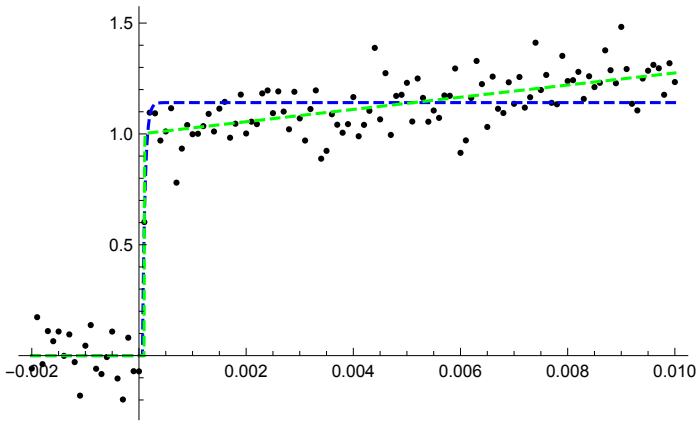


Mono: chi2 = 1.74788 d = 1.74788 a = 1.14128 t = 0.0000465323

Bi: ratio chi2Mono/chi2Bi = 1.53831 d = 0.0000961724 a = 10.1802 a1 = 1.0019 t1 = $4.16604 \times 10^{-6}$ t2 = 0.327945

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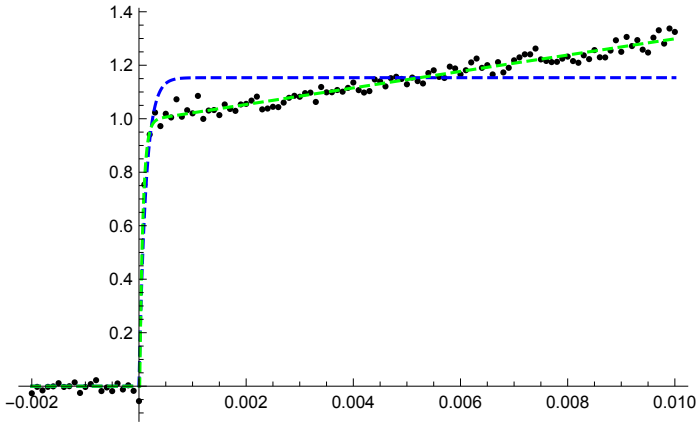


```
Mono: chi2 = 0.770213     d = 0.770213     a = 1.15348     t = 0.000125716
Bi: ratio chi2Mono/chi2Bi = 14.9478     d = 0.0000139603     a =
 9.60846     a1 = 0.991162     t1 =0.0000608519     t2 = 0.274655
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----------------     Ca = 64.6772
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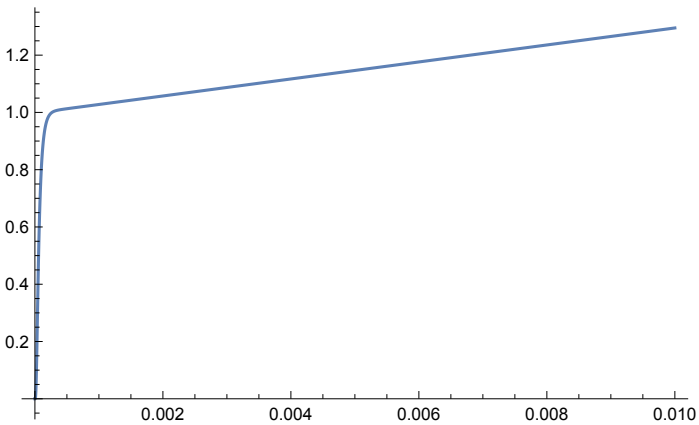

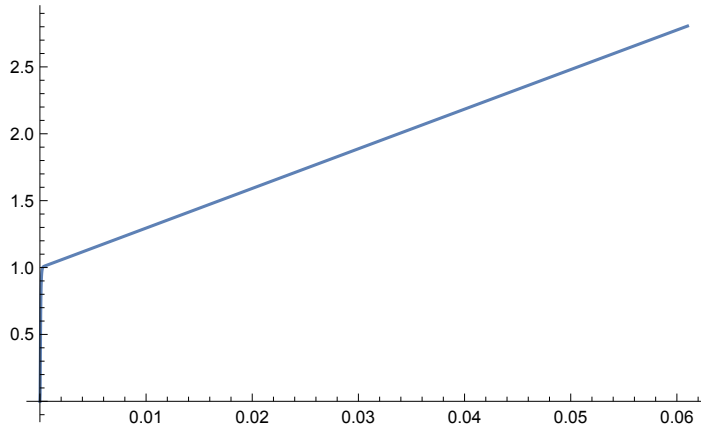


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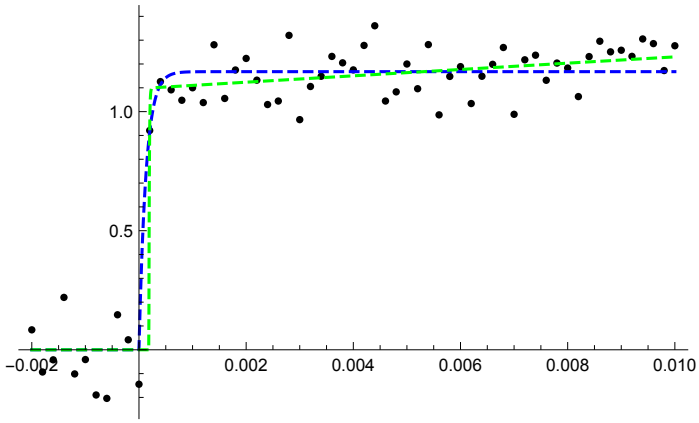


Mono: chi2 = 0.668146  d = 0.668146  a = 1.16776  t = 0.000131109

Bi: ratio chi2Mono/chi2Bi = 1.10912  d = 0.000184249  a = 6.38003  a1 = 1.09909  t1 = $8.66746 \times 10^{-6}$  t2 = 0.39145

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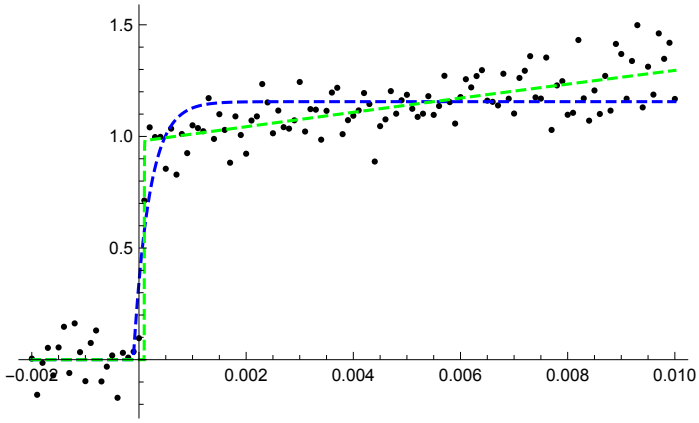


Mono: chi2 = 1.82283 d = 1.82283 a = 1.15575 t = 0.000297812

Bi: ratio chi2Mono/chi2Bi = 1.74156 d = 0.0000972111 a = 5.07509 a1 = 0.98107 t1 =$2.15041 \times 10^{-6}$ t2 = 0.12381

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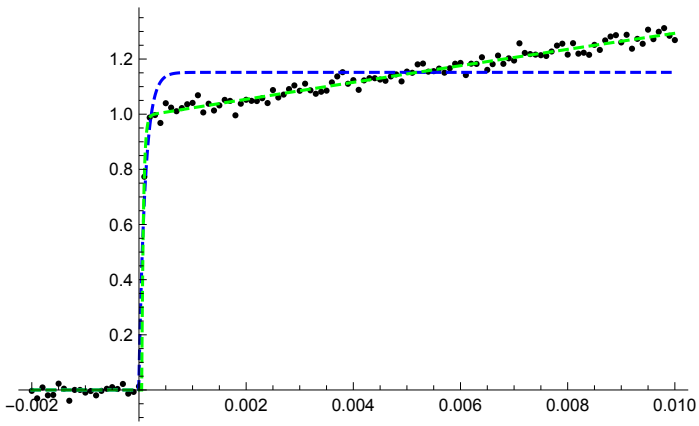

```
Mono: chi2 = 0.72774     d = 0.72774     a = 1.15171     t = 0.000116033
Bi: ratio chi2Mono/chi2Bi = 17.9943     d = 0.0000508229     a =
 4.56655     a1 = 0.993157     t1 =0.000032776     t2 = 0.113332
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 67.8199
  uM         -------------------------------------------------------
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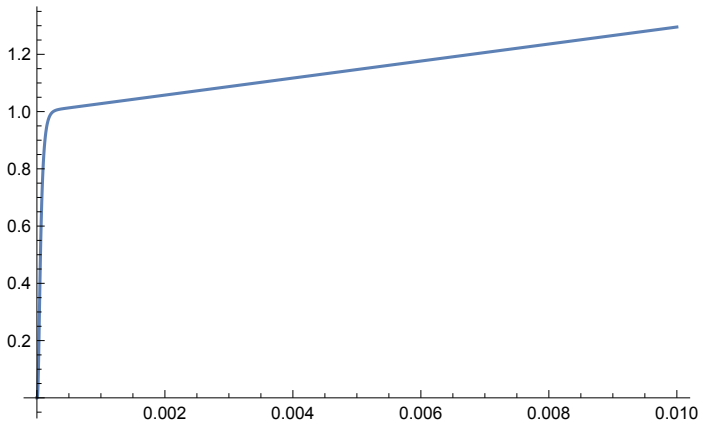
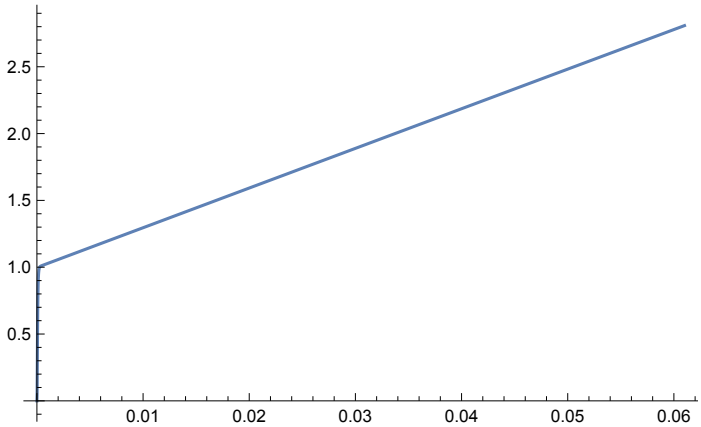
  -------------------------
```

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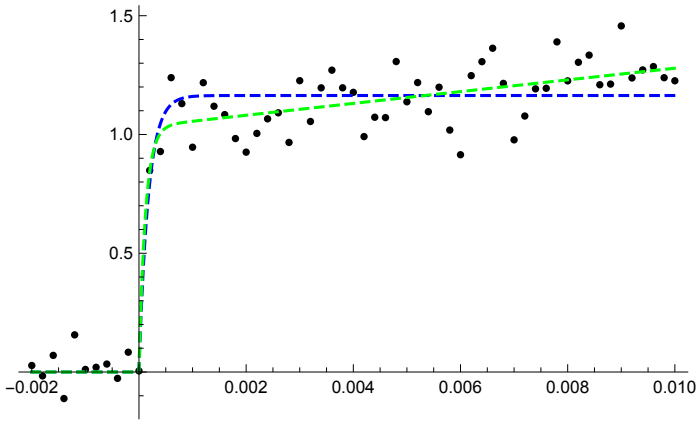


Mono: chi2 = 0.846534  d = 0.846534  a = 1.16402  t = 0.000175926

Bi: ratio chi2Mono/chi2Bi = 1.36087  d = $-5.21354 \times 10^{-7}$

a = 9.64614  a1 = 1.0306  t1 =0.000119602  t2 = 0.341898

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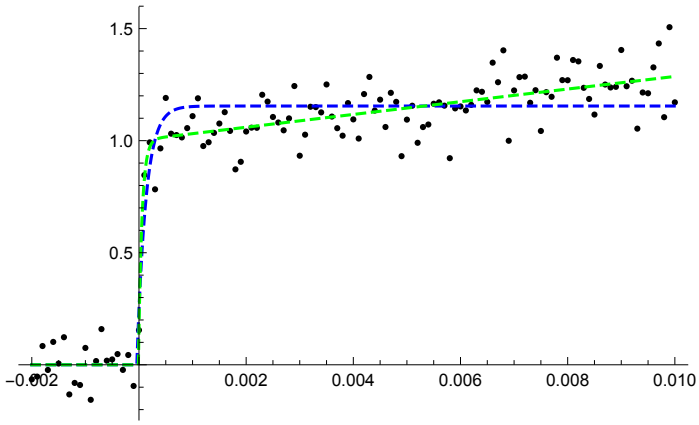


```
Mono: chi2 = 1.6912     d = 1.6912     a = 1.15453     t = 0.0001671
Bi: ratio chi2Mono/chi2Bi = 1.53365     d = -0.0000110403
      a = 11.633     a1 = 1.00219     t1 =0.0000645663     t2 = 0.3693
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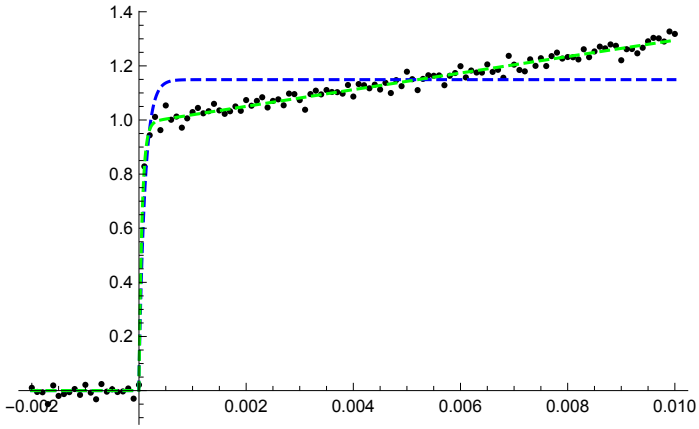


Mono: chi2 = 0.764951 d = 0.764951 a = 1.14912 t = 0.000111122

Bi: ratio chi2Mono/chi2Bi = 17.4406 d = $-1.26791 \times 10^{-6}$ a = 9.10241 a1 = 0.988064 t1 =0.0000573517 t2 = 0.259559

---

---

---------- Ca = 71.1201

uM ----------

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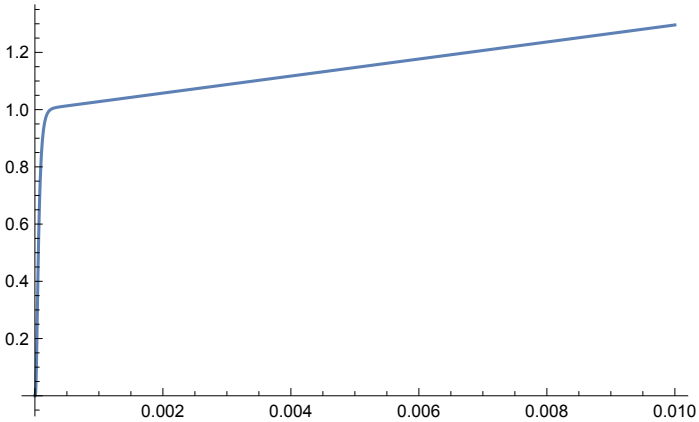

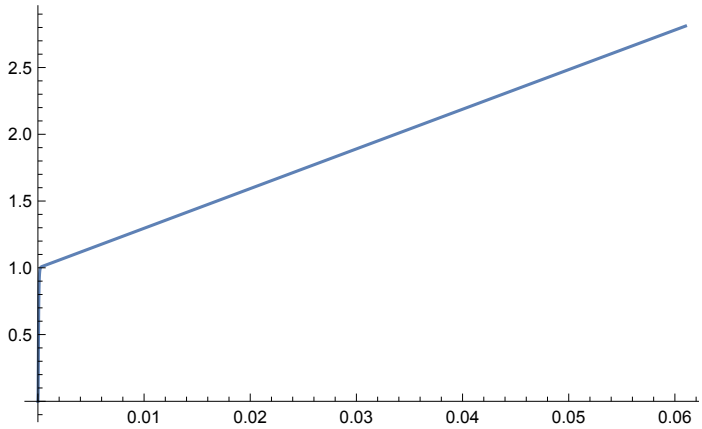


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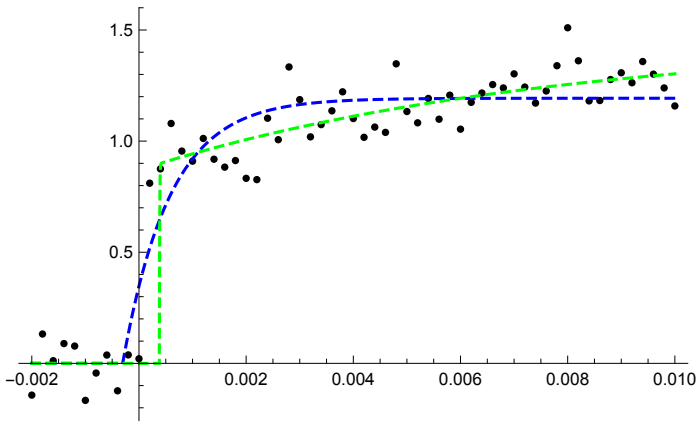


Mono: chi2 = 1.16104 d = 1.16104 a = 1.19289 t = 0.000883472

Bi: ratio chi2Mono/chi2Bi = 0.938392 d = 0.000380424 a = 1.46126 a1 = 0.898709 t1 =$5.48261 \times 10^{-6}$ t2 = 0.00759638

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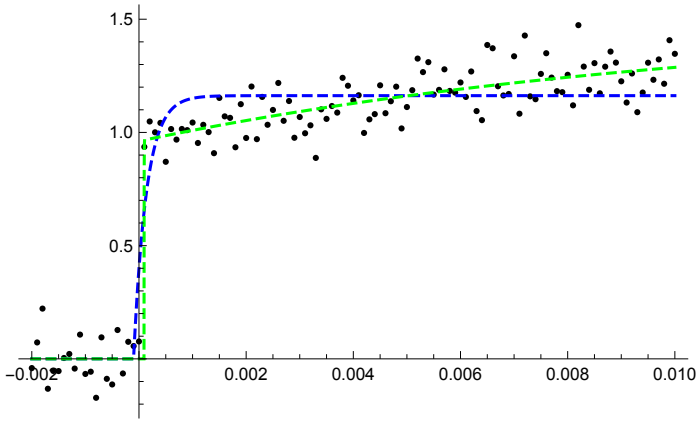


Mono: chi2 = 1.88097 d = 1.88097 a = 1.16239 t = 0.000240236

Bi: ratio chi2Mono/chi2Bi = 1.94501 d = 0.0000936883 a = 1.5027 a1 = 0.966041 t1 =$1.8223 \times 10^{-6}$ t2 = 0.0108541

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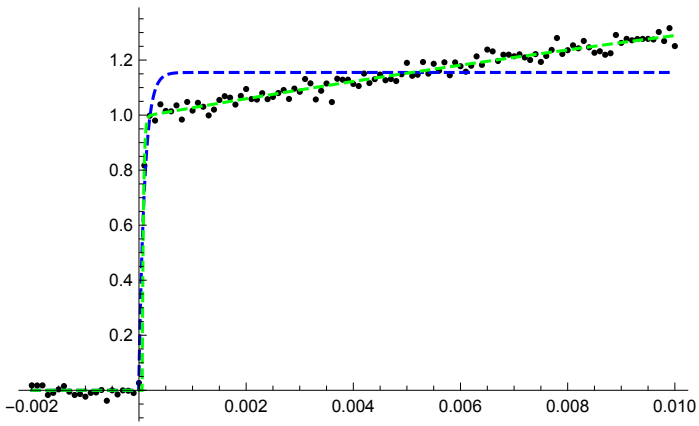

```
Mono: chi2 = 0.710203     d = 0.710203     a = 1.15501     t = 0.00010615
Bi: ratio chi2Mono/chi2Bi = 14.8911     d = 0.0000595472     a =
 2.10566     a1 = 0.99475     t1 =0.0000235778     t2 = 0.0322831
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 74.5861
  uM         -------------------------------------------------------
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  -------------------------
```

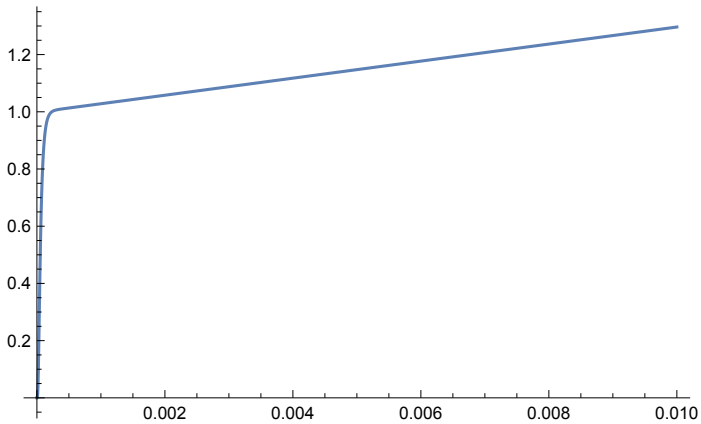


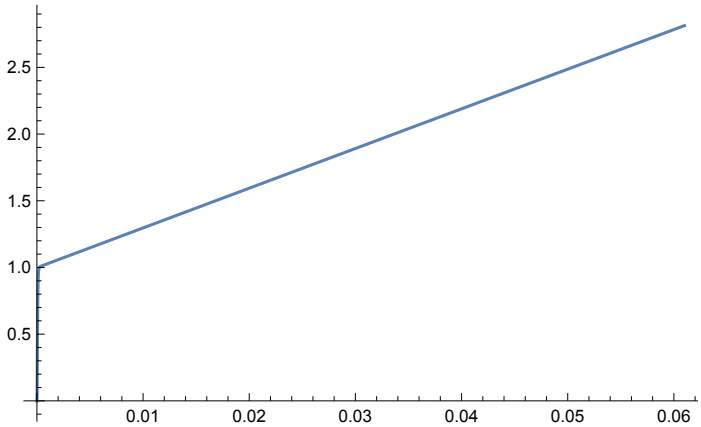


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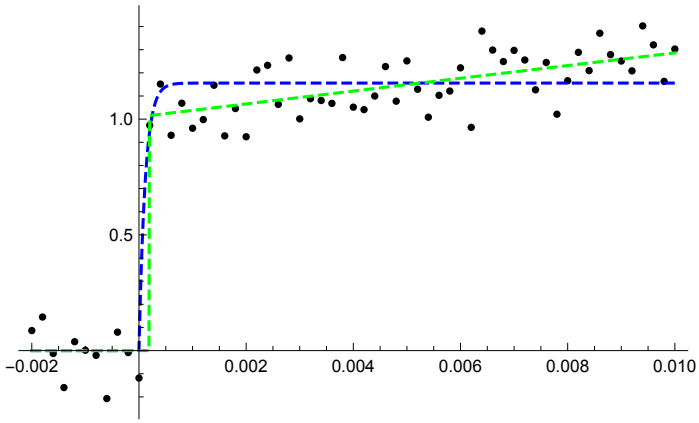


Mono: chi2 = 0.895715 d = 0.895715 a = 1.15584 t = 0.000116684

Bi: ratio chi2Mono/chi2Bi = 1.4964 d = 0.000187921 a = 10.4248 a1 = 1.01523 t1 = $3.79902 \times 10^{-6}$ t2 = 0.335898

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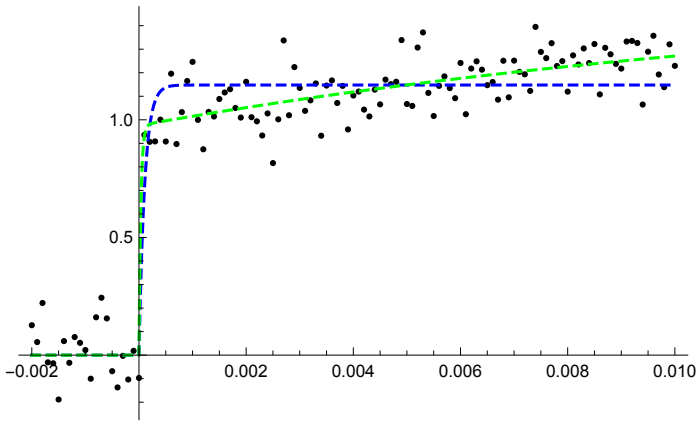


Mono: chi2 = 1.85007 d = 1.85007 a = 1.14778 t = 0.000106714

Bi: ratio chi2Mono/chi2Bi = 1.56178 d = $-6.65427 \times 10^{-18}$ a = 1.57115 a1 = 0.975667 t1 =0.00003429 t2 = 0.0146114

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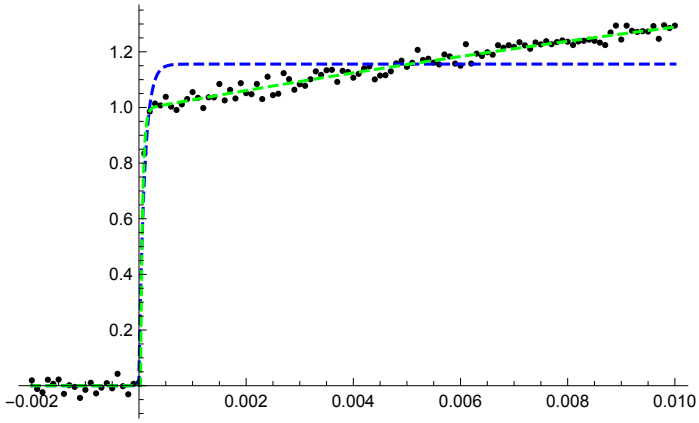



```
Mono: chi2 = 0.713975     d = 0.713975     a = 1.1559     t = 0.000100877
Bi: ratio chi2Mono/chi2Bi = 15.1806     d = 0.0000287032     a =
 1.96074     a1 = 0.993666     t1 =0.0000391894     t2 = 0.0273677
```

# Plots

In[331]:=
```
rrp = 10;
```

In[332]:=
```
caFact = 1*^6;
```

In[333]:=
```
colorA = Green;
colorB = Red;
colorC = Blue;
```

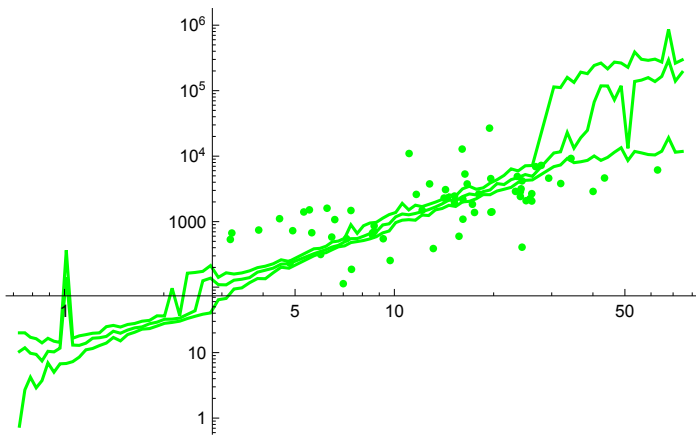
## release rate 1/tau1 (merge of mono 1/tau and bi 1/tau1)

In[336]:=
```
simParam = 15;
```

## C5

In[337]:=
```
gr1a = ListLogLogPlot[
   Transpose[{dataT1C5Ca, dataT1C5RelRate}], PlotStyle → {colorA}];
gr2a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr3a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr4a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
Show[gr1a, gr2a, gr3a, gr4a, PlotRange → All ]
If[exportYes == 1,
  Export["plot InvTau1 C5 data.txt",
   Transpose[{dataT1C5Ca, dataT1C5RelRate}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C5[[simParam, All]],
      simParamMedianC5[[simParam, All]], simParamQuantile2C5[[simParam, All]]}];
  Export["plot InvTau1 C5 fit - quantiles and median.txt", toExport, "Table"];
 ];
```

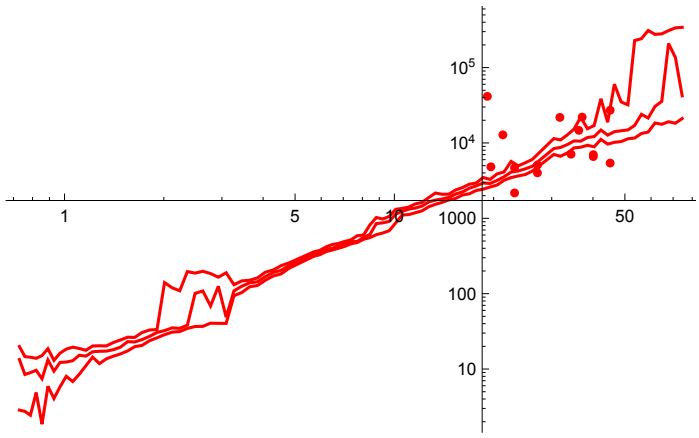
Out[341]=



## C10

In[343]:=
```
gr1b = ListLogLogPlot[
   Transpose[{dataT1C10Ca, dataT1C10RelRate}], PlotStyle → {colorB}];
gr2b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr3b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr4b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
Show[gr1b, gr2b, gr3b, gr4b, PlotRange → All ]
If[exportYes == 1,
  Export["plot InvTau1 C10 data.txt",
   Transpose[{dataT1C10Ca, dataT1C10RelRate}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C10[[simParam, All]],
      simParamMedianC10[[simParam, All]],
      simParamQuantile2C10[[simParam, All]]}];
  Export["plot InvTau1 C10 fit - quantiles and median.txt", toExport, "Table"];
 ];
```

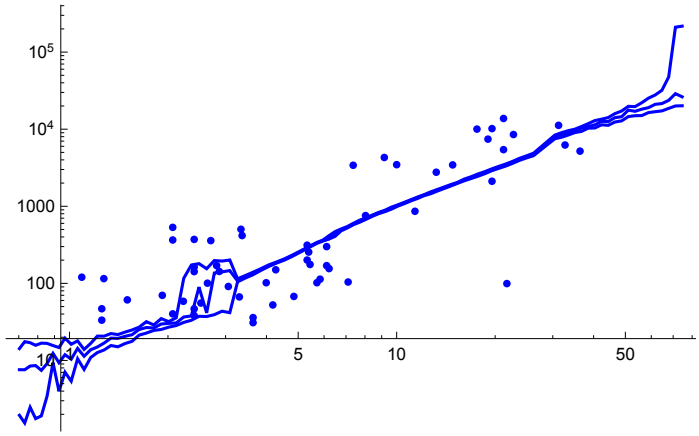
Out[347]=



## D

In[349]:=
```
gr1c =
  ListLogLogPlot[Transpose[{dataT1DCa, dataT1DRelRate}], PlotStyle → {colorC}];
gr2c = ListLogLogPlot[Transpose[
    {caFact simCaList, simParamMedianD[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr3c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile1D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr4c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile2D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
Show[gr1c, gr2c, gr3c, gr4c, PlotRange → All ]
If[exportYes == 1,
  Export["plot InvTau1 D data.txt",
   Transpose[{dataT1DCa, dataT1DRelRate}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1D[[simParam, All]],
     simParamMedianD[[simParam, All]], simParamQuantile2D[[simParam, All]]}];
  Export["plot InvTau1 D fit - quantiles and median.txt", toExport, "Table"];
 ];
```

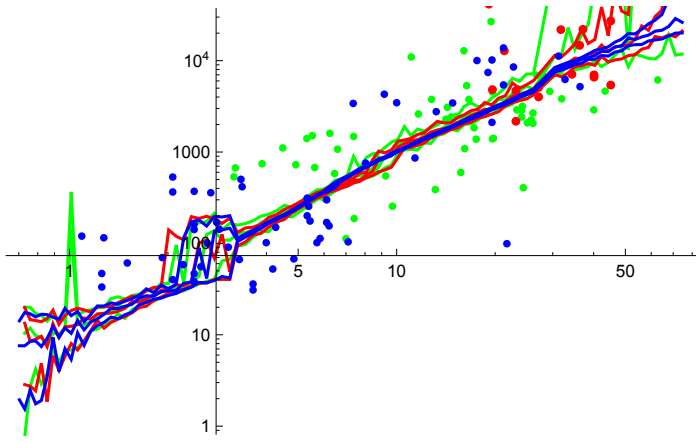
Out[353]=



## C5 and C10 and D

In[355]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {All, {0, 10}}]
```

Out[355]=




In[356]:=
```
Show[gr1a, gr1b, gr1c, PlotRange → {All, {2, 10}}];
```

# delay (mono and bi merged)

In[357]:=
```
simParam = 12;
```

In[358]:=
```
Transpose[{caFact simCaList, simParamMedianC5[[simParam, All]]}] // TableForm
```

Out[358]//TableForm=

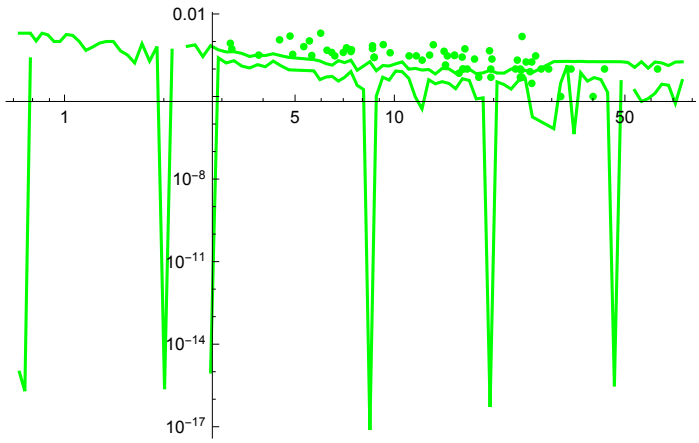
| | |
|---|---|
| 0.703073 | |
| 0.729825 | $9.58594 \times 10^{-16}$ |
| 0.758204 | $1.96486 \times 10^{-16}$ |
| 0.788054 | 0.000233487 |
| 0.820427 | -0.000633631 |
| 0.854404 | -0.000587305 |
| 0.890526 | -0.000366235 |
| 0.928936 | -0.000928035 |
| 0.968962 | -0.000709193 |
| 1.01226 | 0.000788551 |
| 1.05883 | -0.000560485 |
| 1.10833 | -0.000433913 |
| 1.16077 | -0.000324988 |
| 1.21664 | -0.000511742 |
| 1.27589 | -0.000669917 |
| 1.33895 | -0.000318237 |
| 1.40597 | -0.0000534165 |
| 1.47745 | -0.000548535 |
| 1.55324 | -0.000408262 |
| 1.63202 | -0.000483095 |
| 1.71772 | -0.000539573 |
| 1.81058 | -0.000638501 |
| 1.90732 | -0.000281413 |
| 2.01009 | -0.000797626 |
| 2.11924 | -0.000449691 |
| 2.23489 | -0.001 |
| 2.35773 | -0.000700422 |
| 2.48791 | -0.000724638 |
| 2.62605 | -0.0000503756 |
| 2.77177 | $9.7844 \times 10^{-16}$ |
| 2.92648 | 0.00025497 |

| | |
|---|---|
| 3.0905 | 0.000165417 |
| 3.26357 | 0.0002 |
| 3.44741 | 0.000127751 |
| 3.64088 | 0.000109048 |
| 3.84593 | 0.000143833 |
| 4.06272 | 0.000120992 |
| 4.29254 | 0.000193687 |
| 4.53549 | 0.00013022 |
| 4.79194 | 0.0000933557 |
| 5.70182 | 0.0000855618 |
| 5.94854 | 0.0000411087 |
| 6.20769 | 0.0000510616 |
| 6.48003 | 0.0000536894 |
| 6.76619 | 0.0000365659 |
| 7.06711 | 0.0000497554 |
| 7.38317 | 0.000081037 |
| 7.71513 | 0.0000253597 |
| 8.06387 | 0.0000180231 |
| 8.43035 | $7.57923 \times 10^{-18}$ |
| 8.8155 | 0.0000103716 |
| 9.22041 | 0.0000503406 |
| 9.64607 | 0.000039611 |
| 10.0938 | 0.0000845057 |
| 10.5647 | 0.0000799111 |
| 11.0598 | 0.0000460023 |
| 11.5813 | $9.5268 \times 10^{-6}$ |
| 12.1299 | $3.55452 \times 10^{-6}$ |
| 12.7076 | 0.0000407335 |
| 13.3154 | 0.0000290584 |
| 13.9549 | 0.0000346107 |
| 14.63 | 0.0000299476 |
| 15.3404 | 0.0000192148 |
| 16.0887 | 0.0000443227 |
| 16.8774 | 0.0000382479 |
| 17.7084 | $8.20175 \times 10^{-6}$ |
| 18.5844 | $8.93567 \times 10^{-6}$ |
| 19.5079 | $5.20274 \times 10^{-17}$ |
| 20.4816 | 0.0000339953 |
| 21.5084 | 0.0000272017 |
| 22.5913 | 0.0000186774 |
| 23.7336 | 0.000036984 |
| 24.939 | 0.0000448693 |
| 26.2105 | $1.81127 \times 10^{-6}$ |
| 30.4385 | $6.77892 \times 10^{-7}$ |
| 31.9006 | 0.0000300582 |
| 33.4338 | 0.000135375 |
| 35.0413 | $4.29215 \times 10^{-7}$ |
| 36.727 | 0.0000731939 |
| 38.4944 | 0.0000363007 |
| 40.3477 | 0.0000488133 |
| 42.2911 | 0.0000413158 |
| 44.3291 | 0.0000140662 |
| 46.4665 | $2.94631 \times 10^{-16}$ |
| 48.7083 | 0.0000346358 |
| 51.0599 | $-4.0387 \times 10^{-18}$ |
| 53.5266 | 0.0000166284 |
| 56.1157 | $6.6093 \times 10^{-6}$ |
| 58.8318 | $8.42348 \times 10^{-6}$ |
| 61.6839 | 0.000013046 |
| 64.6772 | 0.0000281097 |
| 67.8199 | 0.0000256621 |
| 71.1201 | $5.57682 \times 10^{-6}$ |

## C5

In[359]:=
```
gr1a =
  ListLogLogPlot[Transpose[{dataT1C5Ca, dataT1C5Delay}], PlotStyle → {colorA}];
gr2a = ListLogLogPlot[Transpose[
    {caFact simCaList, simParamMedianC5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr3a = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile1C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr4a = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile2C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
Show[gr1a, gr2a, gr3a, gr4a, PlotRange → All ]
If[exportYes == 1,
  Export["plot delay C5 data.txt",
   Transpose[{dataT1C5Ca, dataT1C5Delay}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C5[[simParam, All]],
     simParamMedianC5[[simParam, All]], simParamQuantile2C5[[simParam, All]]}];
  Export["plot delay C5 fit - quantiles and median.txt", toExport, "Table"];
 ];
```

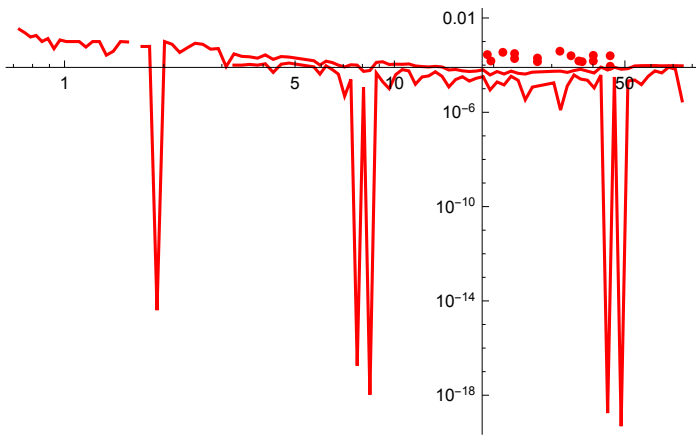
Out[363]=



## C10

In[365]:=
```
gr1b = ListLogLogPlot[
   Transpose[{dataT1C10Ca, dataT1C10Delay}], PlotStyle → {colorB}];
gr2b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr3b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr4b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
Show[gr1b, gr2b, gr3b, gr4b, PlotRange → All ]
If[exportYes == 1,
  Export["plot delay C10 data.txt",
   Transpose[{dataT1C10Ca, dataT1C10Delay}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C10[[simParam, All]],
      simParamMedianC10[[simParam, All]],
      simParamQuantile2C10[[simParam, All]]}];
  Export["plot delay C10 fit - quantiles and median.txt", toExport, "Table"];
 ];
```

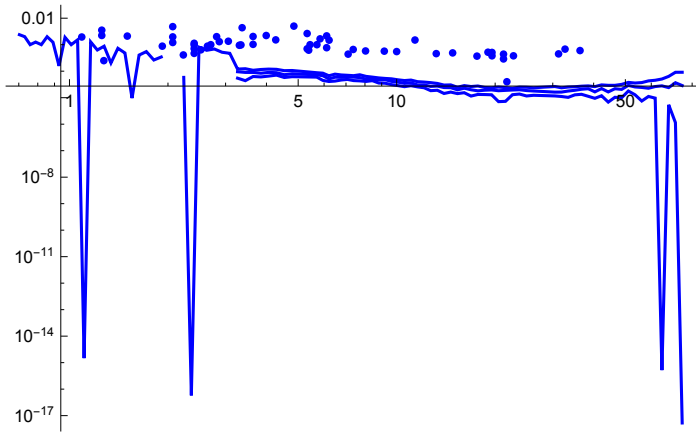
Out[369]=



## D

In[371]:=
```
gr1c =
  ListLogLogPlot[Transpose[{dataT1DCa, dataT1DDelay}], PlotStyle → {colorC}];
gr2c = ListLogLogPlot[Transpose[
    {caFact simCaList, simParamMedianD[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr3c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile1D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr4c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile2D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
Show[gr1c, gr2c, gr3c, gr4c, PlotRange → All ]
If[exportYes == 1,
  Export["plot delay D data.txt",
   Transpose[{dataT1DCa, dataT1DDelay}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1D[[simParam, All]],
     simParamMedianD[[simParam, All]], simParamQuantile2D[[simParam, All]]}];
  Export["plot delay D fit - quantiles and median.txt", toExport, "Table"];
 ];
```

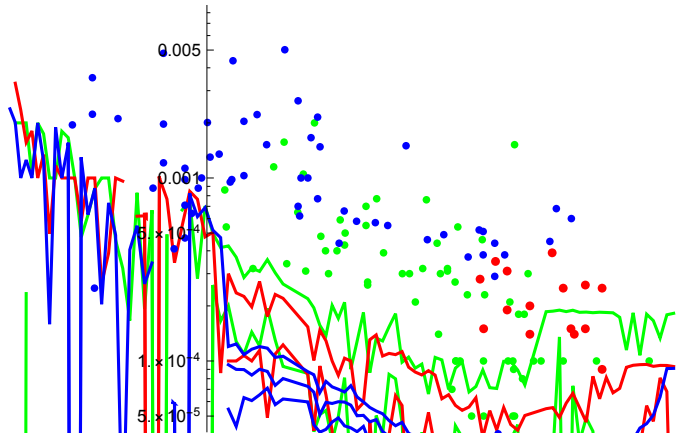
Out[375]=



## C5 and C10 and D

In[377]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {-10, -5}]
```

Out[377]=




In[378]:=
```
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

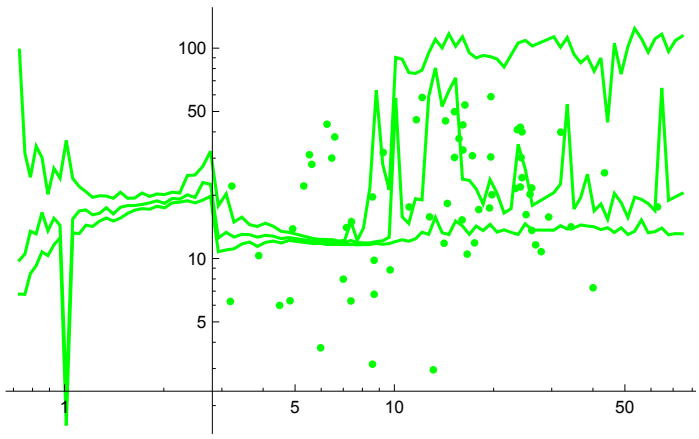
# amp (merge of mono amp and bi amp)

In[379]:=
```
simParam = 13;
```

## C5

In[380]:=
```
gr1a = ListLogLogPlot[
   Transpose[{dataT1C5Ca, dataT1C5Amplitude}], PlotStyle → {colorA}];
gr2a = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamMedianC5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr3a = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile1C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr4a = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile2C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
Show[gr1a, gr2a, gr3a, gr4a, PlotRange → All ]
```

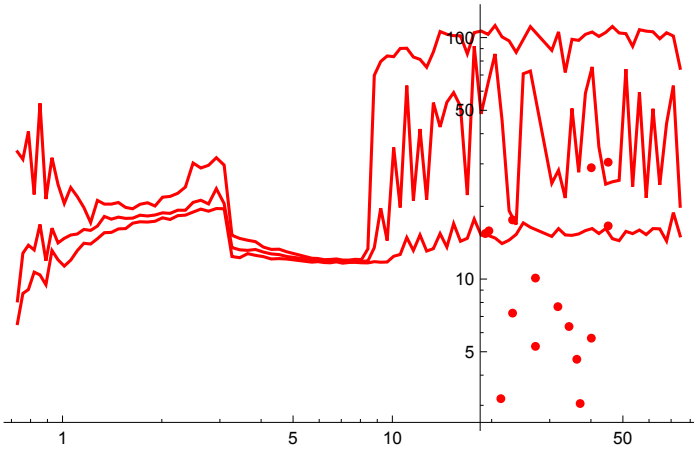
Out[384]=



## C10

In[385]:=
```
gr1b = ListLogLogPlot[
   Transpose[{dataT1C10Ca, dataT1C10Amplitude}], PlotStyle → {colorB}];
gr2b = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamMedianC10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr3b = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile1C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr4b = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile2C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
Show[gr1b, gr2b, gr3b, gr4b, PlotRange → All ]
```

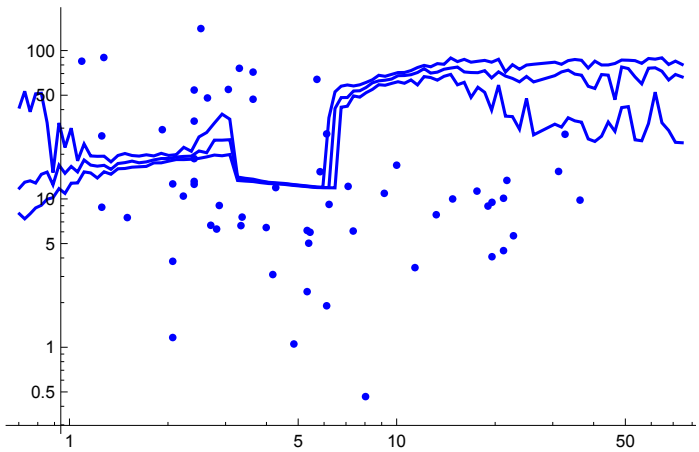
Out[389]=



## D

In[390]:=
```
gr1c = ListLogLogPlot[
   Transpose[{dataT1DCa, dataT1DAmplitude}], PlotStyle → {colorC}];
gr2c = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamMedianD[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr3c = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile1D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr4c = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile2D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
Show[gr1c, gr2c, gr3c, gr4c, PlotRange → All ]
```

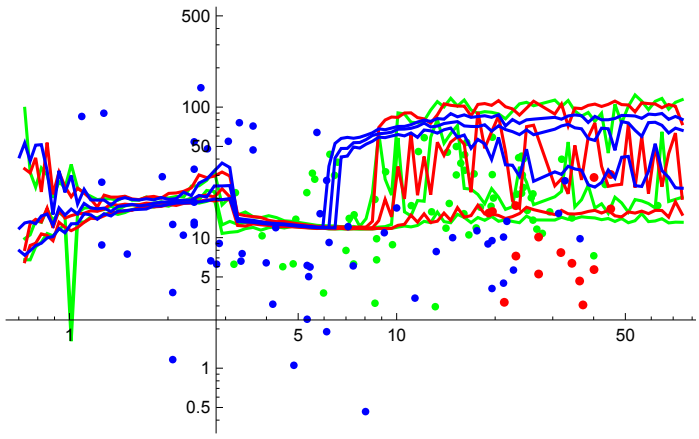
Out[394]=




## C5 and C10 and D

In[395]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {-1, 6} ]
```

Out[395]=



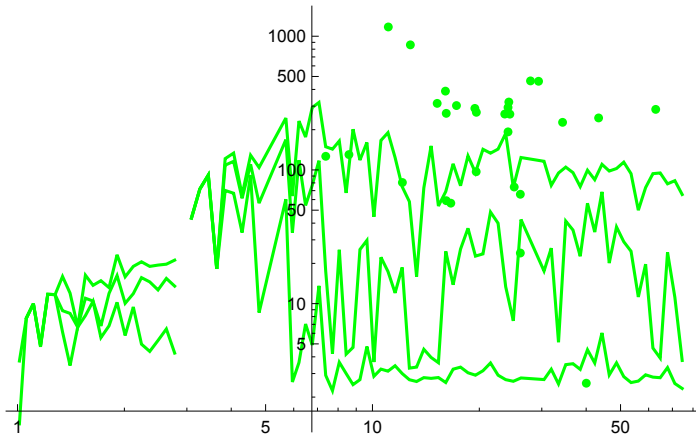
# release rate 1/tau2 of bi fits (if bi is justified)

In[396]:=
```
simParam = 16;
```

## C5

In[397]:=
```
gr1a = ListLogLogPlot[
   Transpose[{dataT2C5Ca, dataT2C5RelRate}], PlotStyle → {colorA}];
gr2a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr3a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr4a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
Show[gr1a, gr2a, gr3a, gr4a, PlotRange → All ]
If[exportYes == 1,
  Export["plot InvTau2 C5 data.txt",
   Transpose[{dataT2C5Ca, dataT2C5RelRate}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C5[[simParam, All]],
      simParamMedianC5[[simParam, All]], simParamQuantile2C5[[simParam, All]]}];
  Export["plot InvTau2 C5 fit - quantiles and median.txt", toExport, "Table"];
 ];
```

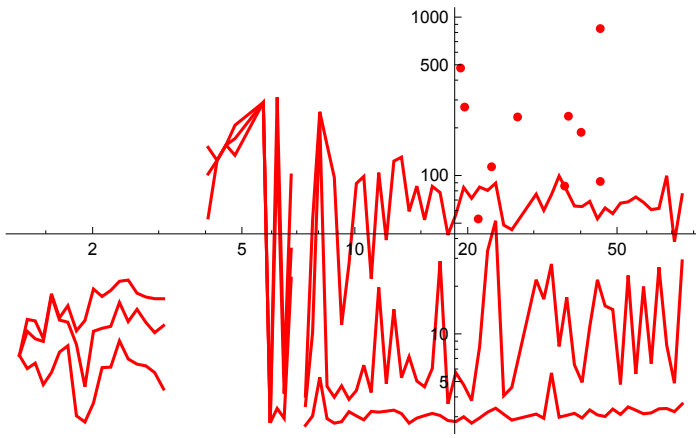
Out[401]=



## C10

In[403]:=
```
gr1b = ListLogLogPlot[
   Transpose[{dataT2C10Ca, dataT2C10RelRate}], PlotStyle → {colorB}];
gr2b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr3b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr4b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
Show[gr1b, gr2b, gr3b, gr4b, PlotRange → All ]
If[exportYes == 1,
  Export["plot InvTau2 C10 data.txt",
   Transpose[{dataT2C10Ca, dataT2C10RelRate}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C10[[simParam, All]],
      simParamMedianC10[[simParam, All]],
      simParamQuantile2C10[[simParam, All]]}];
  Export["plot InvTau2 C10 fit - quantiles and median.txt", toExport, "Table"];
 ];
```

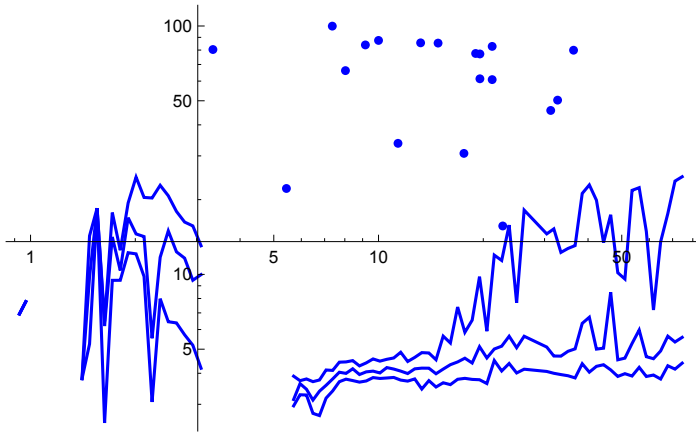
Out[407]=



## D

In[409]:=
```
gr1c =
  ListLogLogPlot[Transpose[{dataT2DCa, dataT2DRelRate}], PlotStyle → {colorC}];
gr2c = ListLogLogPlot[Transpose[
    {caFact simCaList, simParamMedianD[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr3c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile1D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
gr4c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile2D[[simParam, All]]}],
   PlotStyle → { colorC}, Joined → True, PlotRange → All];
Show[gr1c, gr2c, gr3c, gr4c, PlotRange → All ]
If[exportYes == 1,
  Export["plot InvTau2 D data.txt",
   Transpose[{dataT2DCa, dataT2DRelRate}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1D[[simParam, All]],
     simParamMedianD[[simParam, All]], simParamQuantile2D[[simParam, All]]}];
  Export["plot InvTau2 D fit - quantiles and median.txt", toExport, "Table"];
 ];
```

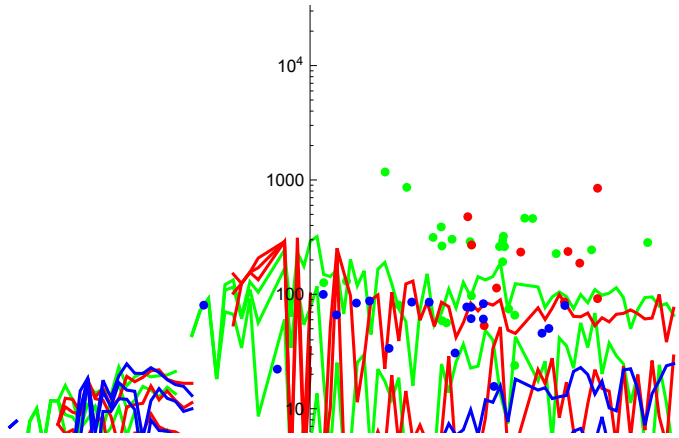
Out[413]=



## C5 and C10 and D

In[415]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {All, {2, 10}}]
```

Out[415]=




In[416]:=
```
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

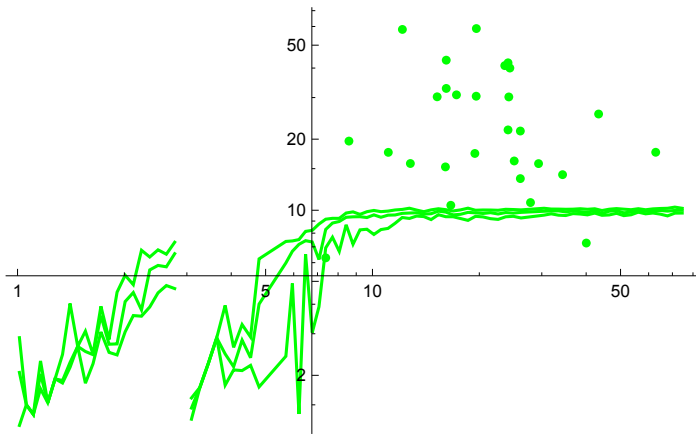
# amp1 of bi fits (if bi is justified)

In[417]:=
```
simParam = 14;
```

## C5

In[418]:=
```
gr1a = ListLogLogPlot[
   Transpose[{dataT2C5Ca, dataT2C5Amplitude1}], PlotStyle → {colorA}];
gr2a = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamMedianC5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr3a = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile1C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr4a = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile2C5[[simParam, All]]}],
   PlotStyle → { colorA}, Joined → True, PlotRange → All];
Show[gr1a, gr2a, gr3a, gr4a, PlotRange → All ]
```

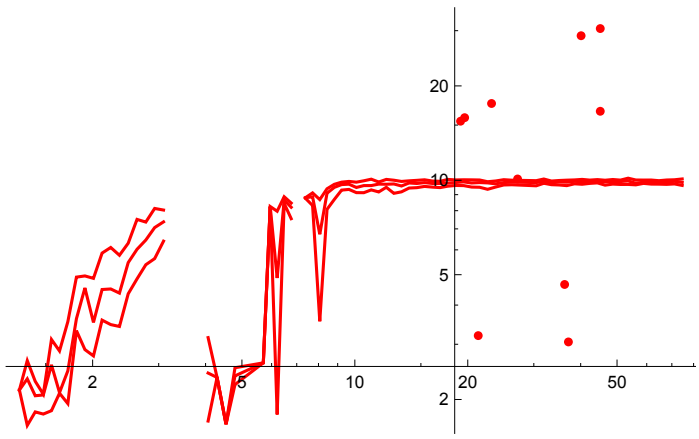
Out[422]=



## C10

In[423]:=
```
gr1b = ListLogLogPlot[
   Transpose[{dataT2C10Ca, dataT2C10Amplitude1}], PlotStyle → {colorB}];
gr2b = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamMedianC10[[simParam, All]]}],
   PlotStyle → { colorB}, Joined → True, PlotRange → All];
gr3b = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile1C10[[simParam, All]]}],
   PlotStyle → {colorB}, Joined → True, PlotRange → All];
gr4b = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile2C10[[simParam, All]]}],
   PlotStyle → {colorB}, Joined → True, PlotRange → All];
Show[gr1b, gr2b, gr3b, gr4b, PlotRange → All ]
```

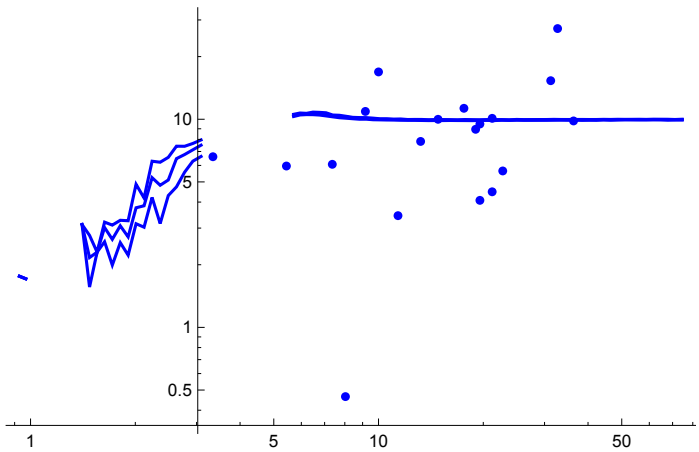
Out[427]=



## D

In[428]:=
```
gr1c = ListLogLogPlot[
   Transpose[{dataT2DCa, dataT2DAmplitude1}], PlotStyle → {colorC}];
gr2c = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamMedianD[[simParam, All]]}],
   PlotStyle → {colorC}, Joined → True, PlotRange → All];
gr3c = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile1D[[simParam, All]]}],
   PlotStyle → {colorC}, Joined → True, PlotRange → All];
gr4c = ListLogLogPlot[Transpose[{caFact simCaList,
      rrp simParamQuantile2D[[simParam, All]]}],
   PlotStyle → {colorC}, Joined → True, PlotRange → All];
Show[gr1c, gr2c, gr3c, gr4c, PlotRange → All ]
```

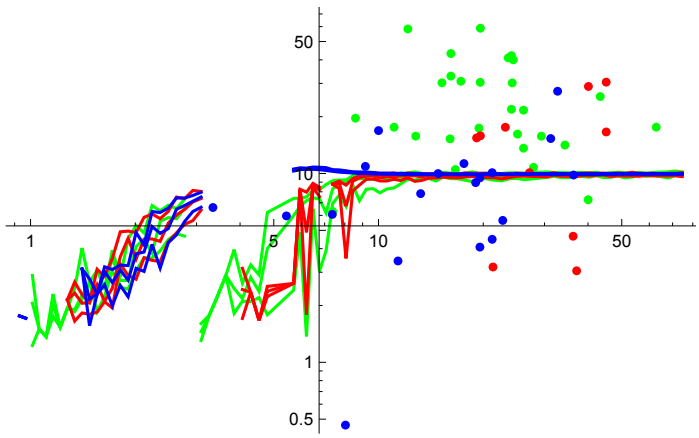
Out[432]=




## C5 and C10 and D

In[433]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b,
 gr3b, gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → All]
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

Out[433]=



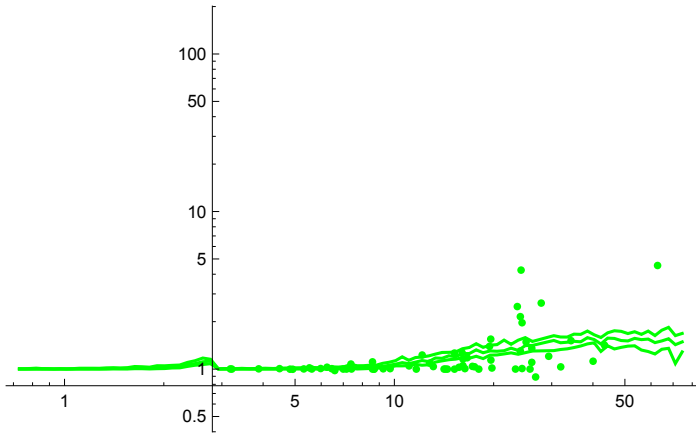
# chi2 mono/bi ratio

In[435]:=
```
simParam = 6;
```

## C5

In[436]:=
```
gr1a = ListLogLogPlot[
   Transpose[{dataT1C5Ca, dataT1C5ChiRatio}], PlotStyle → {colorA}];
gr2a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr3a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
gr4a = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C5[[simParam, All]]}],
   PlotStyle → {colorA}, Joined → True, PlotRange → All];
Show[gr1a, gr2a, gr3a, gr4a, PlotRange → {All, {-0.8, 5}} ]
If[exportYes == 1,
  Export["plot chi2Ratio C5 data.txt",
   Transpose[{dataT1C5Ca, dataT1C5ChiRatio}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C5[[simParam, All]],
      simParamMedianC5[[simParam, All]], simParamQuantile2C5[[simParam, All]]}];
  Export["plot chi2Ratio C5 fit - quantiles and median.txt",
   toExport, "Table"];
 ];
```

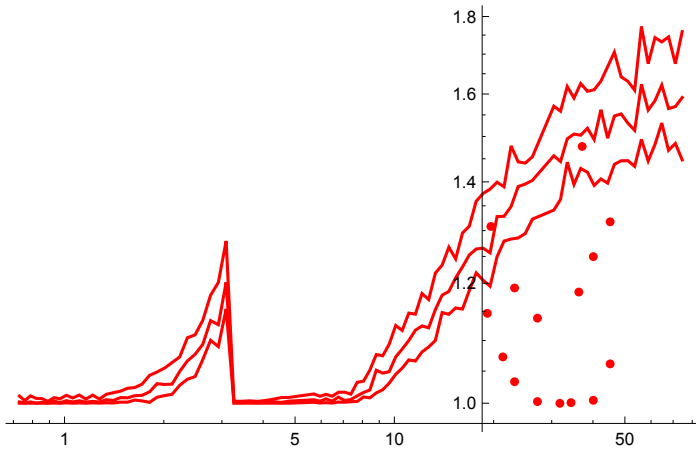
Out[440]=



## C10

In[442]:=
```
gr1b = ListLogLogPlot[
   Transpose[{dataT1C10Ca, dataT1C10ChiRatio}], PlotStyle → {colorB}];
gr2b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamMedianC10[[simParam, All]]}],
   PlotStyle → {colorB}, Joined → True, PlotRange → All];
gr3b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile1C10[[simParam, All]]}],
   PlotStyle → {colorB}, Joined → True, PlotRange → All];
gr4b = ListLogLogPlot[Transpose[{caFact simCaList,
      simParamQuantile2C10[[simParam, All]]}],
   PlotStyle → {colorB}, Joined → True, PlotRange → All];
Show[gr1b, gr2b, gr3b, gr4b, PlotRange → All ]
If[exportYes == 1,
  Export["plot chi2Ratio C10 data.txt",
   Transpose[{dataT1C10Ca, dataT1C10ChiRatio}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1C10[[simParam, All]],
      simParamMedianC10[[simParam, All]],
      simParamQuantile2C10[[simParam, All]]}];
  Export["plot chi2Ratio C10 fit - quantiles and median.txt",
   toExport, "Table"];
 ];
```

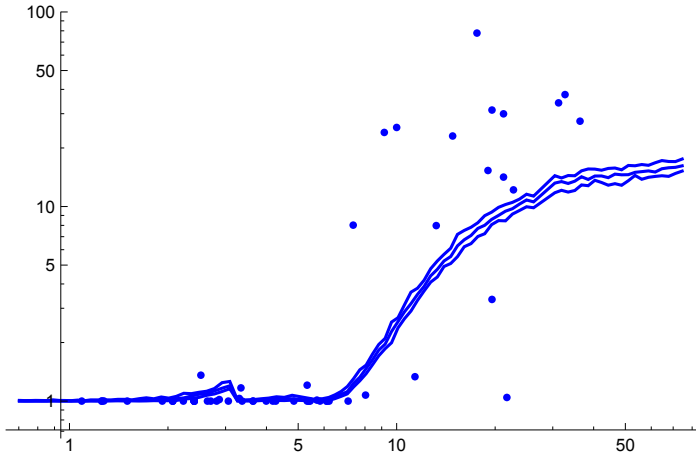
Out[446]=



## D

In[448]:=
```
gr1c =
  ListLogLogPlot[Transpose[{dataT1DCa, dataT1DChiRatio}], PlotStyle → {colorC}];
gr2c = ListLogLogPlot[Transpose[
    {caFact simCaList, simParamMedianD[[simParam, All]]}],
   PlotStyle → {colorC}, Joined → True, PlotRange → All];
gr3c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile1D[[simParam, All]]}],
   PlotStyle → {colorC}, Joined → True, PlotRange → All];
gr4c = ListLogLogPlot[Transpose[{caFact simCaList,
     simParamQuantile2D[[simParam, All]]}],
   PlotStyle → {colorC}, Joined → True, PlotRange → All];
Show[gr1c, gr2c, gr3c, gr4c, PlotRange → All ]
If[exportYes == 1,
  Export["plot chi2Ratio D data.txt",
   Transpose[{dataT1DCa, dataT1DChiRatio}], "Table"];
  toExport = Transpose[{caFact simCaList, simParamQuantile1D[[simParam, All]],
     simParamMedianD[[simParam, All]], simParamQuantile2D[[simParam, All]]}];
  Export["plot chi2Ratio D fit - quantiles and median.txt", toExport, "Table"];
 ];
```

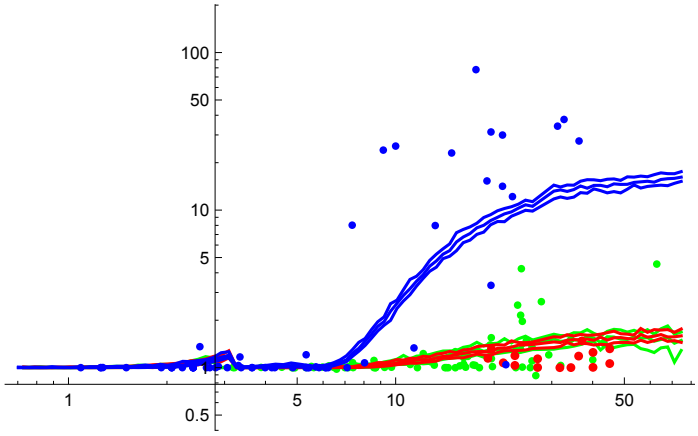
Out[452]=



## C5 and C10 and D

In[454]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {All, {-0.8, 5}}]
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

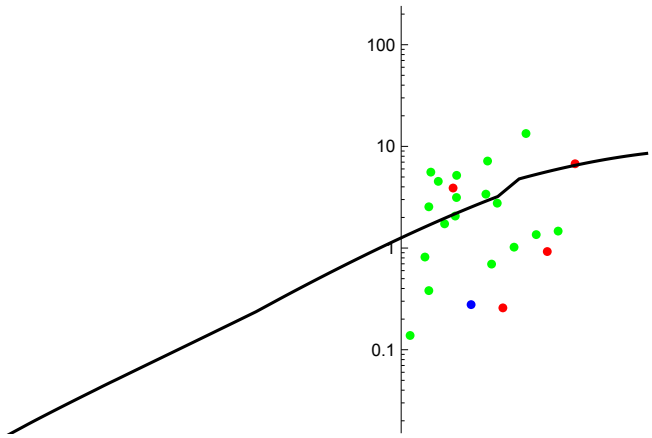
Out[454]=



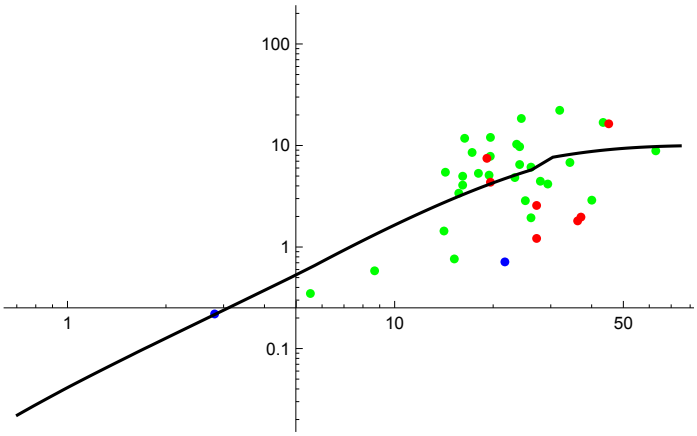

# Nv

In[456]:=
```
For[NvCount = 1, NvCount ≤ 7, NvCount += 1,
  Print[" time for Nv (ms) = ", 1000 * timeOfNv[[NvCount]]];
  gr1a = ListLogLogPlot[
    Transpose[{dataT1C5Ca, dataT1C5Nv[[NvCount]]}], PlotStyle → {colorA}];
  gr1b = ListLogLogPlot[Transpose[{dataT1C10Ca, dataT1C10Nv[[NvCount]]}],
    PlotStyle → {colorB}];
  gr1c = ListLogLogPlot[Transpose[{dataT1DCa, dataT1DNv[[NvCount]]}],
    PlotStyle → {colorC}];
  gr2 = ListLogLogPlot[Transpose[{caFact simCaList, rrp simParamNv[[NvCount,
        All]]}], PlotStyle → { Black}, Joined → True, PlotRange → All];
  Show[gr1a, gr1b, gr1c, gr2, PlotRange → {All, {-4, 5}} ] // Print;
 ];
```

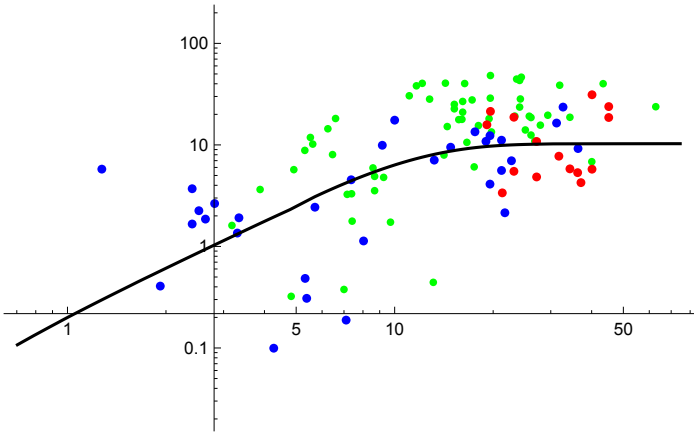
```
time for Nv (ms) = 0.1
```



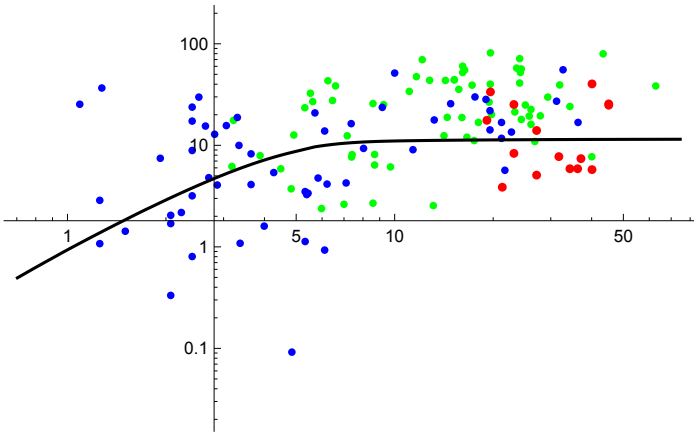

```
time for Nv (ms) = 0.2
```



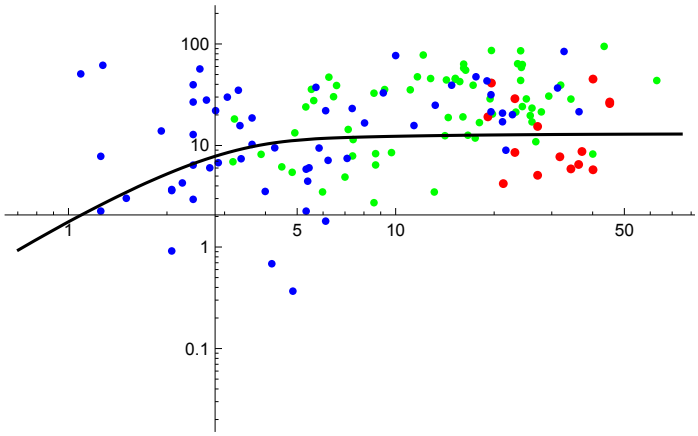

time for Nv (ms) = 1.



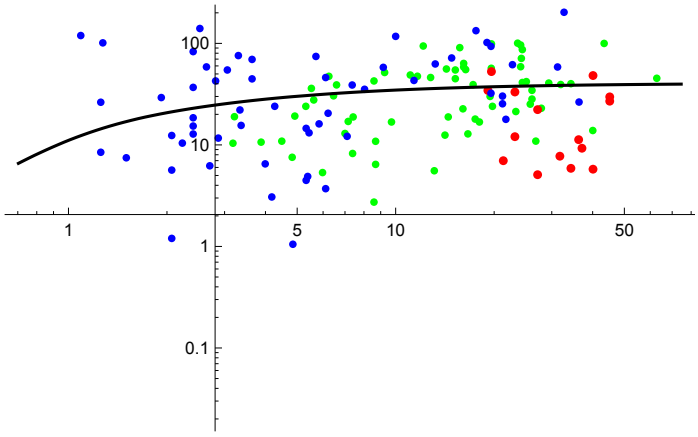

time for Nv (ms) = 5.



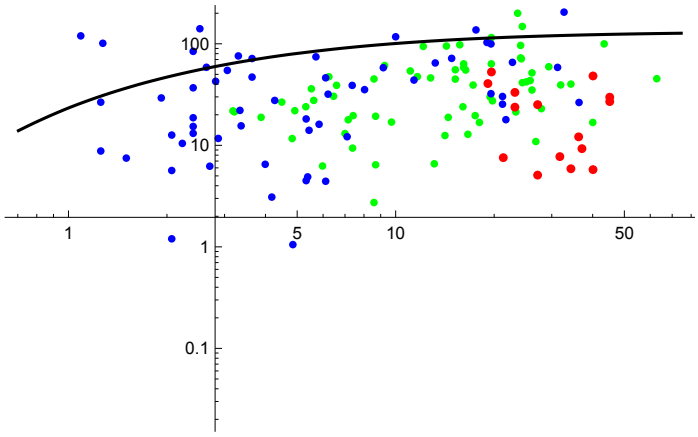

time for Nv (ms) = 10.




```
time for Nv (ms) = 100.
```




```
time for Nv (ms) = 400.
```

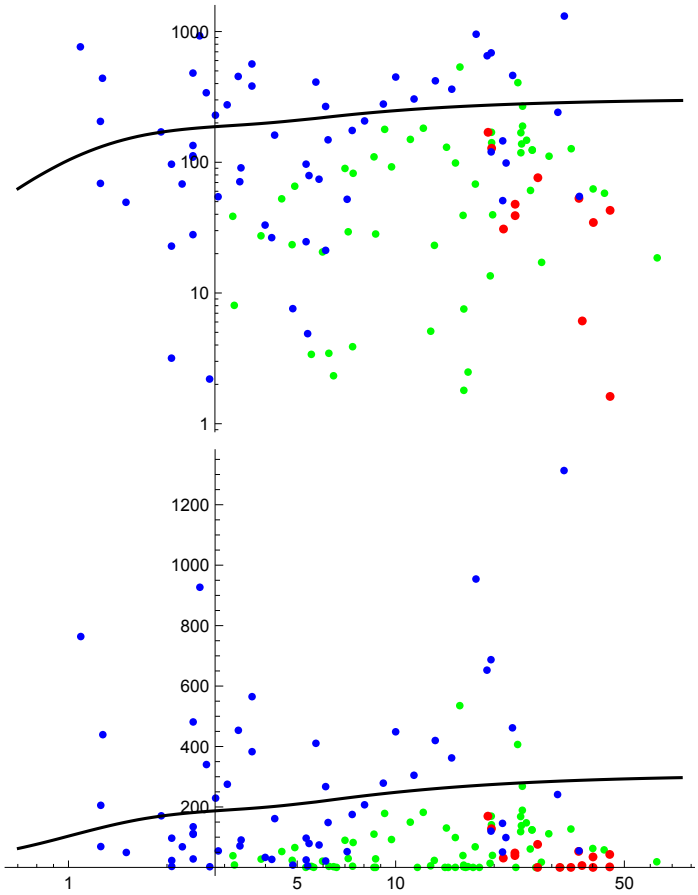


# sustained release 10 to 100 ms

In[457]:=
```
ttt1 = Transpose[{dataT1C5Ca, (dataT1C5Nv[[6]] - dataT1C5Nv[[5]]) / 0.09}];
ttt2 = Transpose[{dataT1C10Ca, (dataT1C10Nv[[6]] - dataT1C10Nv[[5]]) / 0.09}];
ttt3 = Transpose[{dataT1DCa, (dataT1DNv[[6]] - dataT1DNv[[5]]) / 0.09}];
ttt4 = Transpose[
   {caFact simCaList, rrp (simParamNv[[6, All]] - simParamNv[[5, All]]) / 0.09}];

gr1a = ListLogLogPlot[ttt1, PlotStyle → {colorA}];
gr1b = ListLogLogPlot[ttt2, PlotStyle → {colorB}];
gr1c = ListLogLogPlot[ttt3, PlotStyle → {colorC}];
gr2 = ListLogLogPlot[ttt4, PlotStyle → { Black}, Joined → True, PlotRange → All];
Show[gr1a, gr1b, gr1c, gr2, PlotRange → {All, {0, 7}} ] // Print;

gr1a = ListLogLinearPlot[ttt1, PlotStyle → {colorA}];
gr1b = ListLogLinearPlot[ttt2, PlotStyle → {colorB}];
gr1c = ListLogLinearPlot[ttt3, PlotStyle → {colorC}];
gr2 = ListLogLinearPlot[ttt4,
  PlotStyle → { Black}, Joined → True, PlotRange → All];
Show[gr1a, gr1b, gr1c, gr2, PlotRange → {All, All} ] // Print;
```



In[465]:=
```
If[exportYes == 1,
  Export["plot sustained release Cm5 data.txt", ttt1, "Table"];
  Export["plot sustained release Cm10 data.txt", ttt2, "Table"];
  Export["plot sustained release D data.txt", ttt3, "Table"];
  Export["plot sustained release sim.txt", ttt4, "Table"]
 ];
```

## Export Nv

In[466]:=
```
If[exportYes == 1,
  Export["Nv export Ca,0.0001,0.0002,0.001,0.005,0.01,0.1,0.4.txt",
    Transpose[Prepend[simParamNv, caFact simCaList]], "Table"];
 ];
```

# Print some values

### C5

In[467]:=
```
Transpose[simParamMedianC5] // TableForm
Transpose[simParamQuantile1C5] // TableForm
Transpose[simParamQuantile2C5] // TableForm
```

Out[467]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.10548 | $9.58594 \times 10^{-16}$ | 0.982318 | 10.3922 | 1.00035 | $-3.32794 \times 10^{-1}$ |
| 0 | 1.12249 | $1.96486 \times 10^{-16}$ | 1.05015 | 11.8456 | 1.00077 | 0.001 |
| 0 | 1.11417 | 0.000233487 | 1.21621 | 9.77546 | 1.00076 | 0.001 |
| 0 | 1.04721 | -0.000633631 | 1.31038 | 9.39391 | 1.00173 | 0.000847773 |
| 0 | 1.07734 | -0.000587305 | 1.65527 | 7.46978 | 1.00163 | 0.000099208 |
| 0 | 1.0871 | -0.000366235 | 1.35557 | 10.4636 | 1.00198 | 0.00107334 |
| 0 | 1.123 | -0.000928035 | 1.554 | 10.2526 | 1.00077 | -0.001 |
| 0 | 1.06307 | -0.000709193 | 1.43914 | 11.7014 | 1.00164 | 0.000979665 |
| 0 | 0.535895 | 0.000802297 | 0.218557 | 136.992 | 1.00008 | 0.0008 |
| 0 | 1.06656 | -0.000560485 | 1.52276 | 13.0303 | 1.00211 | $-1.10552 \times 10^{-1}$ |
| 0 | 1.09005 | -0.000433913 | 1.6796 | 12.8981 | 1.00325 | 0.00065547 |
| 0 | 1.09553 | -0.000573964 | 1.69233 | 13.7197 | 1.00335 | 0.000289153 |
| 0 | 1.10929 | -0.000511742 | 1.60521 | 16.5923 | 1.00335 | $1.17635 \times 10^{-16}$ |
| 0 | 1.07012 | -0.000669917 | 1.63049 | 16.8684 | 1.00268 | $-1.94808 \times 10^{-1}$ |
| 0 | 1.11546 | -0.000379426 | 1.70251 | 17.3047 | 1.00473 | 0.000417159 |
| 0 | 1.08652 | -0.00011301 | 1.61249 | 20.8215 | 1.00916 | 0.001 |
| 0 | 1.04498 | -0.000689268 | 1.75232 | 19.3221 | 1.00752 | 0.000208146 |
| 0 | 1.06868 | -0.000663383 | 1.73825 | 21.7947 | 1.00747 | $3.22749 \times 10^{-16}$ |
| 0 | 1.10118 | -0.000709087 | 1.76782 | 22.4629 | 1.02203 | 0.000685689 |
| 0 | 1.09687 | -0.000936368 | 1.77971 | 24.6386 | 1.01988 | 0.000943622 |
| 0 | 1.05732 | -0.000837943 | 1.81708 | 26.2298 | 1.01037 | 0.000319508 |
| 0 | 1.1089 | -0.000535797 | 1.82532 | 27.6339 | 1.02444 | 0.000836322 |
| 0 | 1.07435 | -0.001 | 1.80527 | 31.0811 | 1.02227 | 0.0000854446 |
| 0 | 1.09788 | -0.000986208 | 1.89274 | 30.0408 | 1.03726 | 0.000596225 |
| 0 | 1.11436 | -0.00106456 | 1.88431 | 32.4959 | 1.03711 | 0.00034992 |
| 0 | 1.13814 | -0.00123657 | 1.8956 | 33.8168 | 1.06573 | 0.000372925 |
| 0 | 1.13247 | -0.0010816 | 1.87418 | 37.9192 | 1.08319 | 0.000376653 |
| 0 | 1.19679 | -0.00146424 | 1.91209 | 37.2087 | 1.11293 | 0.000254085 |
| 0 | 1.21079 | -0.00143526 | 1.92467 | 39.4829 | 1.12334 | 0.000373602 |
| 0 | 0.593472 | 0.00025497 | 1.25184 | 109.006 | 1.00076 | 0.000278819 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.561752 | 0.0000601098 | 1.33233 | 102.932 | 1.00166 | 0.000261235 |
| 0 | 0.572114 | 0.0002 | 1.25114 | 127.567 | 1.00137 | 0.0002 |
| 0 | 0.586185 | 0.000115739 | 1.27245 | 132.023 | 1.00234 | 0.000241581 |
| 0 | 0.591342 | 0.0000925413 | 1.29867 | 135.74 | 1.0029 | 0.000146902 |
| 0 | 0.590541 | 0.000143833 | 1.25031 | 169.211 | 1.00243 | 0.000153413 |
| 0 | 0.577661 | 0.0000796076 | 1.23816 | 181.385 | 1.00384 | 0.0002 |
| 0 | 0.563396 | 0.000142155 | 1.25947 | 188.265 | 1.00245 | 0.000203746 |
| 0 | 0.584619 | 0.000100184 | 1.23224 | 214.858 | 1.00543 | 0.0002 |
| 0 | 0.568373 | 0.0000888474 | 1.25376 | 226.879 | 1.01 | 0.000184245 |
| 0 | 0.561043 | 0.0000609404 | 1.19326 | 321.496 | 1.00595 | 0.000120458 |
| 0 | 0.591689 | 0.0000184682 | 1.20001 | 342.781 | 1.00523 | 0.0000807644 |
| 0 | 0.572861 | 0.0000455624 | 1.19979 | 371.063 | 1.00595 | 0.000134882 |
| 0 | 0.584898 | 0.0000473629 | 1.18273 | 403.704 | 1.01056 | 0.000132958 |
| 0 | 0.571275 | 0.000034272 | 1.18527 | 430.446 | 1.01071 | 0.0000868867 |
| 0 | 0.578535 | $9.64433 \times 10^{-18}$ | 1.18391 | 464.257 | 1.0118 | 0.000107275 |
| 0 | 0.571446 | $3.77992 \times 10^{-17}$ | 1.17116 | 484.912 | 1.02724 | 0.000151416 |
| 0 | 0.554864 | $5.23697 \times 10^{-6}$ | 1.17776 | 524.533 | 1.01562 | 0.0000736393 |
| 0 | 0.575743 | $-2.81721 \times 10^{-17}$ | 1.17732 | 536.311 | 1.02249 | 0.0000474953 |
| 0 | 0.630528 | -0.0000112226 | 1.17046 | 594.273 | 1.02688 | 0.0000928576 |
| 0 | 0.603608 | -0.0000189247 | 1.18088 | 602.399 | 1.0347 | 0.0000613344 |
| 0 | 0.600283 | -0.0000105214 | 1.1723 | 657.895 | 1.03826 | 0.0000852737 |
| 0 | 0.581978 | -0.0000201132 | 1.17439 | 685.666 | 1.05765 | 0.0000975448 |
| 0 | 0.621053 | -0.0000402319 | 1.18044 | 703.979 | 1.07485 | 0.000102002 |
| 0 | 0.626 | -0.0000131136 | 1.17244 | 760.918 | 1.09844 | 0.000110512 |
| 0 | 0.607402 | -0.000037504 | 1.17445 | 778.714 | 1.08224 | 0.000055876 |
| 0 | 0.660253 | -0.0000335613 | 1.16978 | 852.864 | 1.10642 | 0.0000441532 |
| 0 | 0.619035 | -0.0000406595 | 1.1693 | 901.706 | 1.13319 | 0.0000134511 |
| 0 | 0.636202 | -0.0000417638 | 1.16736 | 955.611 | 1.11607 | 0.0000544314 |
| 0 | 0.680422 | -0.0000614412 | 1.16788 | 1005.35 | 1.17585 | 0.0000386918 |
| 0 | 0.660645 | -0.0000361101 | 1.16221 | 1076.89 | 1.17033 | 0.0000466326 |
| 0 | 0.713595 | -0.0000333025 | 1.17129 | 1117.69 | 1.21441 | 0.0000395827 |
| 0 | 0.680794 | -0.0000531456 | 1.16856 | 1174.5 | 1.1972 | 0.0000276958 |
| 0 | 0.676818 | -0.0000390437 | 1.16842 | 1299.24 | 1.25424 | 0.0000443227 |
| 0 | 0.734592 | -0.0000508141 | 1.16188 | 1366.22 | 1.2546 | 0.0000634264 |
| 0 | 0.742219 | -0.0000438073 | 1.16521 | 1473.33 | 1.32403 | 0.0000154554 |
| 0 | 0.762826 | -0.0000267522 | 1.16679 | 1614.82 | 1.26924 | 0.0000171702 |
| 0 | 0.77738 | -0.0000423244 | 1.16074 | 1644.06 | 1.3037 | $3.04917 \times 10^{-6}$ |
| 0 | 0.726055 | -0.0000303893 | 1.16367 | 1862.48 | 1.29733 | 0.0000407438 |
| 0 | 0.73403 | -0.000026389 | 1.16426 | 2037.57 | 1.30799 | 0.0000315289 |
| 0 | 0.785478 | -0.000016855 | 1.15843 | 2026.6 | 1.35769 | 0.0000186774 |
| 0 | 0.772837 | -0.0000284441 | 1.16219 | 2058.94 | 1.31254 | 0.000036984 |
| 0 | 0.824082 | -0.0000212101 | 1.15528 | 2346.54 | 1.40988 | 0.0000631383 |
| 0 | 0.79784 | -0.0000151854 | 1.15893 | 2586.58 | 1.41287 | 0.0000229058 |
| 0 | 0.840084 | -0.0000157183 | 1.1589 | 3963.71 | 1.5197 | 0.0000448166 |
| 0 | 0.814831 | $-8.00949 \times 10^{-6}$ | 1.15442 | 4179.62 | 1.46898 | 0.0000300582 |
| 0 | 0.814674 | $-7.84762 \times 10^{-7}$ | 1.15192 | 4772.75 | 1.48049 | 0.000162244 |
| 0 | 0.870084 | $-7.45336 \times 10^{-6}$ | 1.15621 | 4310.74 | 1.50055 | 0.0000214405 |
| 0 | 0.86724 | $-2.0813 \times 10^{-17}$ | 1.15635 | 5190.72 | 1.4895 | 0.000125489 |
| 0 | 0.888432 | $-7.58407 \times 10^{-6}$ | 1.15828 | 4625.38 | 1.58269 | 0.0000602679 |
| 0 | 0.873719 | $-1.62083 \times 10^{-6}$ | 1.15588 | 5348.67 | 1.53995 | 0.0000587253 |
| 0 | 0.879734 | $-4.8799 \times 10^{-6}$ | 1.159 | 5070.78 | 1.44359 | 0.0000558005 |
| 0 | 0.957712 | $-7.91578 \times 10^{-6}$ | 1.16169 | 5395.78 | 1.57213 | 0.000134134 |
| 0 | 0.893057 | $-4.68041 \times 10^{-6}$ | 1.16182 | 6264.84 | 1.56458 | 0.0000383474 |
| 0 | 0.913764 | $-6.51467 \times 10^{-18}$ | 1.15503 | 5956.3 | 1.51749 | 0.0000359148 |
| 0 | 0.886374 | $-5.63754 \times 10^{-6}$ | 1.16165 | 5591.67 | 1.50878 | 0.000113059 |
| 0 | 0.940901 | $-9.65891 \times 10^{-6}$ | 1.16015 | 5257.14 | 1.56625 | 0.0000322565 |
| 0 | 0.893092 | $-1.30486 \times 10^{-17}$ | 1.159 | 7209.08 | 1.53749 | 0.000179412 |
| 0 | 0.968327 | $-5.90093 \times 10^{-6}$ | 1.16236 | 6659.96 | 1.55017 | 0.0000491158 |
| 0 | 0.940204 | $-7.53865 \times 10^{-7}$ | 1.16024 | 6523.85 | 1.47199 | 0.000177105 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.896527 | $-3.36121\times10^{-6}$ | 1.16034 | 7618.96 | 1.50866 | 0.0000652283 |
| 0 | 0.937142 | $-1.93313\times10^{-6}$ | 1.15711 | 8052.11 | 1.55726 | 0.0000881142 |
| 0 | 0.888126 | $-1.08246\times10^{-8}$ | 1.15486 | 8118.63 | 1.42839 | 0.0000711883 |
| 0 | 0.905708 | $-1.50154\times10^{-16}$ | 1.15867 | 7904.98 | 1.48761 | 0.000177084 |

Out[468]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.02274 | -0.00217022 | 0.677319 | 0.752026 | 0.999957 | -0.003 |
| 0 | 0.984244 | -0.00343815 | 0.676095 | 2.70246 | 0.999972 | -0.003 |
| 0 | 1.02983 | -0.002 | 0.812025 | 4.21478 | 0.999896 | -0.00193026 |
| 0 | 0.957133 | -0.00224518 | 0.924953 | 2.89828 | 1.00027 | -0.002 |
| 0 | 0.980889 | -0.00264005 | 1.07627 | 3.7335 | 1. | -0.003 |
| 0 | 1.00467 | -0.002 | 1.03252 | 6.95575 | 1.00011 | -0.001 |
| 0 | 1.04669 | -0.00207733 | 1.16327 | 5.02685 | 1. | -0.002 |
| 0 | 0.987131 | -0.00191703 | 1.25253 | 6.74032 | 1.00007 | -0.00024922 |
| 0 | 0.495002 | 0.0002 | 0.160196 | 6.33794 | 0.999563 | 0.0002 |
| 0 | 0.935534 | -0.00217933 | 1.32368 | 7.28127 | 1.00008 | -0.003 |
| 0 | 0.964065 | -0.00170567 | 1.30834 | 8.53651 | 1.00025 | -0.00136128 |
| 0 | 1.00649 | -0.002 | 1.36524 | 11.0313 | 1.00017 | -0.00173812 |
| 0 | 0.973923 | -0.00167856 | 1.41224 | 11.5556 | 1.00028 | -0.001 |
| 0 | 0.940357 | -0.00149208 | 1.49238 | 12.8044 | 1.00033 | -0.001 |
| 0 | 1.01336 | -0.00116072 | 1.49964 | 13.9925 | 1.00105 | -0.000234026 |
| 0 | 0.979133 | -0.00081078 | 1.48628 | 17.0444 | 1.00173 | $-1.75058\times10$ |
| 0 | 0.957943 | -0.00167347 | 1.55642 | 15.0165 | 1.00174 | -0.001 |
| 0 | 0.925768 | -0.00146749 | 1.62918 | 18.6139 | 1.00164 | -0.00135265 |
| 0 | 0.996244 | -0.00113345 | 1.67055 | 20.1957 | 1.00564 | $-3.55352\times10$ |
| 0 | 0.998987 | -0.00161328 | 1.69603 | 22.8001 | 1.0054 | -0.000521126 |
| 0 | 0.958631 | -0.00108177 | 1.71585 | 22.5551 | 1.00194 | -0.000801242 |
| 0 | 0.987996 | -0.00167635 | 1.70804 | 24.847 | 1.00579 | $1.12343\times10^{-}$ |
| 0 | 0.991529 | -0.00150714 | 1.73804 | 27.4934 | 1.00757 | -0.000227877 |
| 0 | 0.978519 | -0.00158067 | 1.81196 | 27.9121 | 1.01628 | -0.00026716 |
| 0 | 1.01539 | -0.00156702 | 1.82632 | 30.0936 | 1.01802 | -0.000348553 |
| 0 | 1.03568 | -0.00187626 | 1.84655 | 31.3793 | 1.03933 | $-9.74095\times10$ |
| 0 | 1.03725 | -0.00170367 | 1.82011 | 33.7464 | 1.05762 | -0.000058644 |
| 0 | 1.09251 | -0.002 | 1.88535 | 34.784 | 1.06847 | $-9.78825\times10$ |
| 0 | 1.04825 | -0.00201755 | 1.87134 | 36.911 | 1.08242 | $8.0497\times10^{-16}$ |
| 0 | 0.494603 | -0.0000475934 | 1.07711 | 64.2152 | 1.00001 | 0.000040414 |
| 0 | 0.489782 | -0.000112757 | 1.09876 | 67.2277 | 1.00008 | $-6.80114\times10$ |
| 0 | 0.520601 | $-9.12162\times10^{-17}$ | 1.10786 | 93.5114 | 1.00045 | $-1.5822\times10^{-}$ |
| 0 | 0.519586 | -0.0000458151 | 1.17217 | 97.345 | 1.00033 | $-3.64067\times10$ |
| 0 | 0.522604 | -0.0000586422 | 1.19787 | 116.664 | 1.00035 | $-5.61178\times10$ |
| 0 | 0.536648 | -0.0000790253 | 1.13737 | 135.208 | 1.00011 | -0.000112989 |
| 0 | 0.495388 | -0.0000544184 | 1.17812 | 134.294 | 1.00003 | $-5.31178\times10$ |
| 0 | 0.519885 | -0.000141196 | 1.20405 | 154.506 | 1.00095 | $-9.40545\times10$ |
| 0 | 0.520432 | 0.0000134528 | 1.18456 | 192.725 | 1.00004 | 0.0000560023 |
| 0 | 0.5093 | -0.000106724 | 1.21732 | 193.236 | 1.00062 | -0.000026852 |
| 0 | 0.518139 | -0.0000507483 | 1.17229 | 300.526 | 1.0021 | $-1.86724\times10$ |
| 0 | 0.544969 | -0.0000735139 | 1.17819 | 324.174 | 1.00046 | -0.000038773 |
| 0 | 0.518674 | $-9.46467\times10^{-16}$ | 1.16393 | 335.818 | 1.00093 | $3.67689\times10^{-6}$ |
| 0 | 0.507435 | -0.0000111132 | 1.1554 | 372.795 | 1.00081 | 0.0000113753 |
| 0 | 0.502558 | -0.0000439555 | 1.16349 | 397.408 | 1.00289 | $-5.2145\times10^{-}$ |
| 0 | 0.516565 | -0.0000832466 | 1.16206 | 421.2 | 1.00018 | $-1.99387\times10$ |
| 0 | 0.509032 | -0.0000488687 | 1.15473 | 448.628 | 1.00984 | $1.98527\times10^{-}$ |
| 0 | 0.511196 | -0.0000500358 | 1.15532 | 492.238 | 1.00132 | $1.08963\times10^{-6}$ |
| 0 | 0.511039 | -0.0000832871 | 1.16099 | 489.871 | 1.00464 | $-2.96557\times10$ |
| 0 | 0.524088 | -0.0000994359 | 1.15394 | 532.379 | 1.00851 | $-4.7489\times10^{-}$ |
| 0 | 0.496719 | -0.0000871061 | 1.16297 | 561.024 | 1.01283 | $-9.78815\times10$ |
| 0 | 0.542143 | -0.0000720117 | 1.15651 | 602.17 | 1.01603 | $7.51287\times10^{-6}$ |
| 0 | 0.510302 | -0.0000797705 | 1.16027 | 638.113 | 1.02672 | $3.08753\times10^{-}$ |
| 0 | 0.544597 | -0.000138839 | 1.16452 | 648.83 | 1.04835 | 0.000024667 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.560753 | −0.0000698368 | 1.15262 | 710.7 | 1.04796 | $1.45423 \times 10^{-1}$ |
| 0 | 0.550214 | −0.000114268 | 1.15503 | 728.153 | 1.05183 | $-1.05297 \times 10$ |
| 0 | 0.592478 | −0.000117213 | 1.15895 | 776.041 | 1.07213 | $-6.50588 \times 10$ |
| 0 | 0.572188 | −0.000125569 | 1.14731 | 833.589 | 1.05779 | −0.000013351 |
| 0 | 0.598436 | −0.0000820848 | 1.15041 | 838.943 | 1.06521 | $-4.29667 \times 10$ |
| 0 | 0.62349 | −0.000130576 | 1.15432 | 912.556 | 1.10773 | $-4.35663 \times 10$ |
| 0 | 0.590662 | −0.000119769 | 1.1504 | 958.654 | 1.12793 | $-1.95277 \times 10$ |
| 0 | 0.636722 | −0.000115915 | 1.16214 | 1012.62 | 1.14675 | $-1.04134 \times 10$ |
| 0 | 0.605385 | −0.000115951 | 1.15569 | 1046.3 | 1.15653 | $-5.81002 \times 10$ |
| 0 | 0.601107 | −0.0000867057 | 1.15332 | 1152.56 | 1.18035 | $-8.42248 \times 10$ |
| 0 | 0.632322 | −0.000128069 | 1.14714 | 1158.4 | 1.17196 | $-1.60719 \times 10$ |
| 0 | 0.656857 | −0.0000936911 | 1.15141 | 1337.68 | 1.20595 | $-8.08556 \times 10$ |
| 0 | 0.64763 | −0.0000829052 | 1.15566 | 1296.93 | 1.16556 | $-8.28429 \times 10$ |
| 0 | 0.658208 | −0.0000885948 | 1.15121 | 1442.71 | 1.22581 | −0.000011333 |
| 0 | 0.635452 | −0.0000706541 | 1.15042 | 1641.61 | 1.22942 | $-2.06512 \times 10$ |
| 0 | 0.658897 | −0.0000830608 | 1.14466 | 1553.96 | 1.2476 | $-7.29224 \times 10$ |
| 0 | 0.667964 | −0.0000979122 | 1.14849 | 1589.29 | 1.26739 | $-8.34989 \times 10$ |
| 0 | 0.692677 | −0.0000614529 | 1.14782 | 1700.95 | 1.24149 | $-5.14518 \times 10$ |
| 0 | 0.752203 | −0.0000606942 | 1.14062 | 2086.36 | 1.27075 | $-1.08806 \times 10$ |
| 0 | 0.690336 | −0.0000586274 | 1.15154 | 1898.9 | 1.30187 | $-6.55516 \times 10$ |
| 0 | 0.7646 | −0.0000428441 | 1.14675 | 3029.02 | 1.30967 | $-6.44798 \times 10$ |
| 0 | 0.731848 | −0.0000249994 | 1.1444 | 3297.52 | 1.33115 | $-5.5966 \times 10^{-1}$ |
| 0 | 0.720019 | −0.000021589 | 1.13806 | 3698.47 | 1.34428 | $-5.99669 \times 10$ |
| 0 | 0.795822 | −0.0000239148 | 1.14458 | 3519.69 | 1.36959 | $-4.05988 \times 10$ |
| 0 | 0.746753 | −0.0000176043 | 1.14444 | 3913.67 | 1.40101 | $-1.45494 \times 10$ |
| 0 | 0.793282 | −0.0000448598 | 1.15149 | 3099.62 | 1.44439 | $-3.89787 \times 10$ |
| 0 | 0.765086 | −0.000016399 | 1.14618 | 4252.9 | 1.46845 | $-1.94218 \times 10$ |
| 0 | 0.786635 | −0.0000191652 | 1.14446 | 3892.42 | 1.29398 | $-5.9433 \times 10^{-}$ |
| 0 | 0.833611 | −0.0000241217 | 1.14746 | 3377.95 | 1.40543 | $-6.66013 \times 10$ |
| 0 | 0.831624 | −0.0000214057 | 1.14595 | 4097.09 | 1.34186 | $-3.15799 \times 10$ |
| 0 | 0.757709 | −0.000011954 | 1.14909 | 4948.83 | 1.37351 | $-3.40206 \times 10$ |
| 0 | 0.770064 | −0.0000299805 | 1.14931 | 4345.97 | 1.39815 | $-1.49148 \times 10$ |
| 0 | 0.793673 | −0.0000244827 | 1.15031 | 4315.87 | 1.40498 | $-7.40123 \times 10$ |
| 0 | 0.82437 | $-7.97475 \times 10^{-6}$ | 1.14837 | 5797.23 | 1.32056 | $-6.61489 \times 10$ |
| 0 | 0.812719 | −0.0000284594 | 1.1484 | 3900.6 | 1.29231 | $-1.06486 \times 10$ |
| 0 | 0.821378 | −0.000013316 | 1.14279 | 4399.27 | 1.24678 | $7.46684 \times 10^{-6}$ |
| 0 | 0.806281 | −0.0000253718 | 1.1502 | 4642.54 | 1.33577 | $-1.44424 \times 10$ |
| 0 | 0.814252 | −0.0000120134 | 1.14565 | 6251.6 | 1.3543 | 0.0000151949 |
| 0 | 0.747164 | −0.0000147158 | 1.14516 | 5953.15 | 1.08382 | $-1.51269 \times 10$ |
| 0 | 0.755631 | $-6.78356 \times 10^{-6}$ | 1.14615 | 6275.37 | 1.28495 | 0.0000120258 |

Out[469]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.20062 | 0.002 | 9.78373 | 20.026 | 1.00606 | 0.00373936 |
| 0 | 1.15995 | 0.002 | 3.17297 | 20.0408 | 1.00567 | 0.00326228 |
| 0 | 1.20521 | 0.002 | 2.4331 | 17.1353 | 1.0087 | 0.004 |
| 0 | 1.17463 | 0.00104307 | 3.42123 | 16.2964 | 1.01342 | 0.00266136 |
| 0 | 1.18452 | 0.002 | 3.02007 | 14.0849 | 1.00711 | 0.00236978 |
| 0 | 1.19913 | 0.00174341 | 2.02099 | 16.5306 | 1.00627 | 0.003 |
| 0 | 1.20066 | 0.001 | 2.68281 | 14.9143 | 1.0032 | 0.00127846 |
| 0 | 1.19243 | 0.001 | 2.40996 | 14.2977 | 1.00619 | 0.00299999 |
| 0 | 0.633828 | 0.0018 | 3.64065 | 358.622 | 1.00466 | 0.0018 |
| 0 | 1.14871 | 0.001 | 2.40195 | 16.4674 | 1.00602 | 0.002 |
| 0 | 1.17851 | 0.001 | 2.19896 | 18.0273 | 1.01229 | 0.002 |
| 0 | 1.21383 | 0.000323069 | 1.87482 | 18.578 | 1.01232 | 0.00202571 |
| 0 | 1.20004 | 0.000396217 | 1.95431 | 19.7525 | 1.01235 | 0.00185808 |
| 0 | 1.13055 | 0.000872693 | 1.98774 | 20.0292 | 1.01157 | 0.00147496 |
| 0 | 1.18071 | 0.000900027 | 1.92012 | 21.9621 | 1.0178 | 0.00194797 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.23237 | 0.000906241 | 1.8223 | 24.4489 | 1.02026 | 0.002 |
| 0 | 1.14199 | 0.00037265 | 2.06603 | 23.6014 | 1.01699 | 0.00161863 |
| 0 | 1.21615 | 0.000035675 | 1.88705 | 24.7529 | 1.02128 | 0.00144799 |
| 0 | 1.17307 | $1.53504 \times 10^{-15}$ | 1.90602 | 24.5883 | 1.03832 | 0.00182451 |
| 0 | 1.17423 | 0.00031557 | 1.86142 | 28.0824 | 1.03467 | 0.00193687 |
| 0 | 1.22252 | $3.73293 \times 10^{-17}$ | 1.94361 | 29.0985 | 1.02807 | 0.001 |
| 0 | 1.21727 | $3.93095 \times 10^{-16}$ | 1.93659 | 31.6918 | 1.05041 | 0.00185851 |
| 0 | 1.15301 | −0.000414744 | 1.89399 | 32.8396 | 1.04892 | 0.000901802 |
| 0 | 1.22883 | −0.000221061 | 1.95002 | 33.2661 | 1.05578 | 0.00119277 |
| 0 | 1.19896 | −0.0006493 | 1.9399 | 35.266 | 1.06094 | 0.000870721 |
| 0 | 1.30179 | −0.000898952 | 1.95168 | 36.4993 | 1.10205 | 0.001 |
| 0 | 1.26229 | −0.000758994 | 1.94838 | 40.9898 | 1.12983 | 0.000924949 |
| 0 | 1.30737 | −0.001 | 1.97557 | 39.6421 | 1.17493 | 0.000782391 |
| 0 | 1.31502 | −0.00118526 | 1.97587 | 42.5962 | 1.15382 | 0.000702994 |
| 0 | 0.660213 | 0.000498194 | 1.78073 | 141.026 | 1.00508 | 0.000526183 |
| 0 | 0.614488 | 0.00035059 | 1.79441 | 150.392 | 1.00755 | 0.0005953 |
| 0 | 0.686884 | 0.000396433 | 1.49002 | 153.48 | 1.00489 | 0.000491121 |
| 0 | 0.646687 | 0.000308482 | 1.57257 | 154.042 | 1.01085 | 0.000504368 |
| 0 | 0.632732 | 0.00023715 | 1.44835 | 176.993 | 1.00603 | 0.000379025 |
| 0 | 0.658008 | 0.000277959 | 1.35891 | 197.401 | 1.00922 | 0.000393409 |
| 0 | 0.623079 | 0.000250379 | 1.43831 | 203.45 | 1.01238 | 0.000389357 |
| 0 | 0.636449 | 0.000302499 | 1.3646 | 220.365 | 1.00855 | 0.000418086 |
| 0 | 0.656037 | 0.0002 | 1.29945 | 245.111 | 1.01375 | 0.00032666 |
| 0 | 0.649295 | 0.000233541 | 1.31222 | 245.079 | 1.01633 | 0.000319894 |
| 0 | 0.624505 | 0.000204581 | 1.23905 | 368.606 | 1.0227 | 0.000288478 |
| 0 | 0.658692 | 0.000185061 | 1.2219 | 385.326 | 1.01978 | 0.000247234 |
| 0 | 0.654418 | 0.000148461 | 1.22971 | 401.107 | 1.02168 | 0.000289884 |
| 0 | 0.649496 | 0.000136112 | 1.21798 | 476.234 | 1.03281 | 0.000284546 |
| 0 | 0.688955 | 0.000170593 | 1.20627 | 495.432 | 1.02961 | 0.000330394 |
| 0 | 0.645039 | 0.000131425 | 1.20424 | 507.001 | 1.038 | 0.000259104 |
| 0 | 0.679506 | 0.0000971965 | 1.19065 | 541.846 | 1.06989 | 0.000215978 |
| 0 | 0.622108 | 0.0000830561 | 1.19152 | 564.874 | 1.04989 | 0.000206632 |
| 0 | 0.660249 | 0.0000678003 | 1.19248 | 615.185 | 1.05075 | 0.000173704 |
| 0 | 0.722488 | 0.0000717179 | 1.18433 | 657.837 | 1.05794 | 0.000245738 |
| 0 | 0.638773 | 0.0000135709 | 1.19226 | 646.741 | 1.05894 | 0.000155192 |
| 0 | 0.697787 | 0.0000413689 | 1.19023 | 706.043 | 1.08779 | 0.000199294 |
| 0 | 0.663925 | 0.0000341126 | 1.19053 | 771.652 | 1.10506 | 0.000153182 |
| 0 | 0.706778 | 0.0000474292 | 1.1937 | 814.623 | 1.13172 | 0.000155352 |
| 0 | 0.681051 | $2.03555 \times 10^{-16}$ | 1.19002 | 868.943 | 1.19616 | 0.000197445 |
| 0 | 0.706913 | $4.79104 \times 10^{-17}$ | 1.19228 | 854.878 | 1.13638 | 0.0000984665 |
| 0 | 0.750682 | $-7.48152 \times 10^{-19}$ | 1.18972 | 940.742 | 1.18318 | 0.000106286 |
| 0 | 0.734943 | $-1.11929 \times 10^{-17}$ | 1.18196 | 1028.92 | 1.19353 | 0.0000913902 |
| 0 | 0.717257 | $-1.52028 \times 10^{-20}$ | 1.18471 | 1053.97 | 1.21198 | 0.000113283 |
| 0 | 0.757034 | $-8.73289 \times 10^{-6}$ | 1.17737 | 1116.27 | 1.24459 | 0.0000660813 |
| 0 | 0.750439 | $-1.1863 \times 10^{-6}$ | 1.17665 | 1228.1 | 1.2749 | 0.000113198 |
| 0 | 0.810178 | $-3.86761 \times 10^{-19}$ | 1.18172 | 1273.88 | 1.27695 | 0.000103617 |
| 0 | 0.79348 | $-8.42962 \times 10^{-6}$ | 1.17728 | 1359.27 | 1.28371 | 0.0000753295 |
| 0 | 0.793972 | $-1.15331 \times 10^{-17}$ | 1.17594 | 1518.8 | 1.34629 | 0.0000914006 |
| 0 | 0.8206 | $-1.22932 \times 10^{-19}$ | 1.17519 | 1506.08 | 1.37098 | 0.000103463 |
| 0 | 0.834247 | $-4.07303 \times 10^{-6}$ | 1.17811 | 1610.77 | 1.44892 | 0.0000677751 |
| 0 | 0.882514 | $2.74156 \times 10^{-18}$ | 1.17585 | 1846.45 | 1.3739 | 0.0000725261 |
| 0 | 0.847 | $1.05291 \times 10^{-18}$ | 1.17296 | 1878. | 1.41838 | 0.0000892365 |
| 0 | 0.837697 | $-1.83288 \times 10^{-18}$ | 1.17099 | 1995.3 | 1.42972 | 0.0000810608 |
| 0 | 0.887553 | $-5.54053 \times 10^{-18}$ | 1.17578 | 2267.56 | 1.52714 | 0.0000749954 |
| 0 | 0.874862 | $-3.89214 \times 10^{-18}$ | 1.17066 | 2400.63 | 1.43633 | 0.000114431 |
| 0 | 0.85343 | $-1.02067 \times 10^{-18}$ | 1.17269 | 2545.41 | 1.52555 | 0.0000994 |
| 0 | 0.912719 | $-8.98246 \times 10^{-18}$ | 1.16932 | 2854.51 | 1.58384 | 0.0000924626 |
| 0 | 0.912668 | $-2.5055 \times 10^{-18}$ | 1.17176 | 2999.16 | 1.49744 | 0.0000739778 |
| 0 | 0.945354 | $-9.88283 \times 10^{-19}$ | 1.17477 | 4824.35 | 1.62948 | 0.000190607 |
| 0 | 0.929173 | $-2.77773 \times 10^{-18}$ | 1.16421 | 5843.88 | 1.59801 | 0.000187172 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.917798 | $1.19716 \times 10^{-18}$ | 1.1642 | 5599.77 | 1.59637 | 0.000190151 |
| 0 | 0.972936 | $-1.59522 \times 10^{-18}$ | 1.17117 | 5301.2 | 1.66633 | 0.000187466 |
| 0 | 0.961836 | $2.30706 \times 10^{-18}$ | 1.1717 | 6611.37 | 1.66073 | 0.000190632 |
| 0 | 0.948049 | $-9.86286 \times 10^{-18}$ | 1.17017 | 6258.46 | 1.74342 | 0.000186156 |
| 0 | 0.969839 | $-1.18791 \times 10^{-18}$ | 1.16832 | 7135.26 | 1.65004 | 0.000185132 |
| 0 | 0.961342 | $-2.61813 \times 10^{-18}$ | 1.169 | 8262.46 | 1.58568 | 0.000188825 |
| 0 | 1.10364 | $-3.88122 \times 10^{-18}$ | 1.17915 | 6997.18 | 1.69931 | 0.000190478 |
| 0 | 0.976937 | $-7.91605 \times 10^{-18}$ | 1.1727 | 8210.2 | 1.75063 | 0.00018882 |
| 0 | 1.02104 | $-5.86121 \times 10^{-19}$ | 1.16223 | 7992.91 | 1.73588 | 0.000183457 |
| 0 | 0.989492 | $-4.11285 \times 10^{-18}$ | 1.16942 | 6984.3 | 1.68046 | 0.000190949 |
| 0 | 1.05525 | $-1.00409 \times 10^{-17}$ | 1.17514 | 7630.22 | 1.726 | 0.000184475 |
| 0 | 1.02766 | $1.40608 \times 10^{-19}$ | 1.17162 | 10 636.2 | 1.66045 | 0.000191572 |
| 0 | 1.09708 | $-1.24063 \times 10^{-18}$ | 1.16807 | 8453.21 | 1.74217 | 0.000184831 |
| 0 | 1.03484 | $-1.25793 \times 10^{-18}$ | 1.16821 | 10 806.2 | 1.63174 | 0.000198175 |
| 0 | 0.994105 | $-1.45985 \times 10^{-17}$ | 1.16776 | 10 430.2 | 1.76427 | 0.00018992 |
| 0 | 1.01222 | $-4.94108 \times 10^{-18}$ | 1.16812 | 10 945.8 | 1.84029 | 0.000188391 |
| 0 | 1.07628 | $1.12424 \times 10^{-18}$ | 1.16741 | 11 226.5 | 1.63094 | 0.0003013 |
| 0 | 1.01834 | $-4.67956 \times 10^{-19}$ | 1.16831 | 13 176.7 | 1.68361 | 0.000198728 |

## C10

In[470]:=
```
Transpose[simParamMedianC10] // TableForm
Transpose[simParamQuantile1C10] // TableForm
Transpose[simParamQuantile2C10] // TableForm
```

Out[470]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.08101 | $7.06108 \times 10^{-16}$ | 0.798329 | 13.3707 | 1.00197 | $1.74389 \times 10^{-15}$ |
| 0 | 1.12437 | -0.000685386 | 1.27928 | 8.46846 | 1.00057 | 0.000226409 |
| 0 | 1.04716 | -0.001 | 1.38091 | 8.95594 | 1.00197 | 0.000793222 |
| 0 | 1.10355 | -0.000739184 | 1.32014 | 9.63104 | 1.0004 | 0.0005 |
| 0 | 1.07044 | -0.000436619 | 1.68336 | 7.43168 | 1.00114 | $-1.84492 \times 10^{-15}$ |
| 0 | 1.10297 | -0.000180134 | 1.19029 | 13.1893 | 1.00038 | 0.000217589 |
| 0 | 1.06338 | -0.00096098 | 1.6249 | 9.38217 | 1.00339 | -0.0000211921 |
| 0 | 1.10171 | -0.000546847 | 1.41144 | 12.241 | 1.0008 | $-5.55056 \times 10^{-10}$ |
| 0 | 1.12778 | -0.000309782 | 1.47429 | 12.3815 | 1.00384 | 0.00055885 |
| 0 | 1.10084 | -0.000248605 | 1.52192 | 12.89 | 1.00195 | 0.000340617 |
| 0 | 1.08723 | -0.0000471325 | 1.53646 | 15.2396 | 1.00378 | 0.001 |
| 0 | 1.12867 | -0.000605368 | 1.60553 | 14.8504 | 1.0016 | 0.0000451204 |
| 0 | 1.0773 | $1.12036 \times 10^{-15}$ | 1.59045 | 16.933 | 1.00284 | 0.001 |
| 0 | 1.11456 | -0.00044917 | 1.64612 | 17.2028 | 1.00182 | $7.143 \times 10^{-17}$ |
| 0 | 1.11388 | -0.000241855 | 1.72717 | 17.0694 | 1.00533 | 0.0000790774 |
| 0 | 1.11237 | -0.000518508 | 1.75486 | 17.2349 | 1.00417 | 0.00077574 |
| 0 | 1.15833 | -0.000412055 | 1.80384 | 18.886 | 1.00853 | 0.000915044 |
| 0 | 1.08992 | -0.000259899 | 1.71627 | 23.0808 | 1.00823 | 0.001 |
| 0 | 1.08671 | -0.000762038 | 1.78744 | 22.363 | 1.0115 | 0.000262063 |
| 0 | 1.10032 | -0.00067154 | 1.79612 | 24.0422 | 1.0121 | 0.000460822 |
| 0 | 1.08965 | -0.000588 | 1.81127 | 25.9383 | 1.01741 | 0.000581692 |
| 0 | 1.05866 | -0.000823444 | 1.78944 | 28.1895 | 1.0301 | 0.00072773 |
| 0 | 1.13104 | -0.000775728 | 1.8413 | 29.0822 | 1.02892 | 0.000831565 |
| 0 | 1.09172 | -0.000742723 | 1.82636 | 31.9829 | 1.02946 | 0.000479086 |
| 0 | 1.12129 | -0.000996428 | 1.87941 | 32.2479 | 1.04955 | 0.000488606 |
| 0 | 1.17989 | -0.00131835 | 1.86534 | 34.8466 | 1.06634 | 0.000571698 |
| 0 | 1.16262 | -0.0010995 | 1.88854 | 36.5516 | 1.0772 | 0.00053875 |
| 0 | 1.16845 | -0.00136538 | 1.90537 | 37.6933 | 1.09374 | 0.000520811 |
| 0 | 1.23926 | -0.0016126 | 1.92657 | 39.4458 | 1.13388 | 0.000348519 |
| 0 | 1.23008 | -0.00170195 | 1.94867 | 40.3021 | 1.12676 | 0.000332499 |
| 0 | 1.31424 | -0.00161589 | 1.95595 | 42.4289 | 1.20201 | 0.000431216 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.18035 | 0.0001 | 1.3504 | 108.986 | 1.00087 | 0.000197519 |
| 0 | 1.18015 | 0.0001 | 1.32154 | 125.504 | 1.00066 | 0.000130399 |
| 0 | 1.12209 | 0.000107219 | 1.31479 | 138.472 | 1.00132 | 0.000151441 |
| 0 | 1.15196 | 0.0001 | 1.32587 | 143.981 | 1.00102 | 0.000120208 |
| 0 | 1.16434 | 0.0001 | 1.28939 | 168. | 1.00189 | 0.00015305 |
| 0 | 1.21323 | 0.0000490599 | 1.26608 | 191.206 | 1.00248 | 0.0000873237 |
| 0 | 1.13551 | 0.0001 | 1.26294 | 202.349 | 1.00123 | 0.000137344 |
| 0 | 1.17039 | 0.000100809 | 1.23401 | 235.741 | 1.00321 | 0.000122419 |
| 0 | 1.21808 | 0.0000843758 | 1.20114 | 336.177 | 1.00522 | 0.0000953335 |
| 0 | 1.18268 | 0.0000415165 | 1.1993 | 349.45 | 1.0031 | 0.0000503102 |
| 0 | 1.15025 | 0.0000883377 | 1.18571 | 387.536 | 1.00676 | 0.000109943 |
| 0 | 1.16915 | 0.0000651615 | 1.18615 | 395.199 | 1.00297 | 0.0000818924 |
| 0 | 1.18224 | 0.0000316472 | 1.18979 | 424.646 | 1.00935 | 0.0001 |
| 0 | 1.20225 | $4.81973\times10^{-6}$ | 1.17979 | 453.373 | 1.00417 | 0.0000664058 |
| 0 | 1.21693 | 0.0000205901 | 1.18069 | 492.29 | 1.00569 | 0.0000774579 |
| 0 | 1.192 | $-1.25359\times10^{-6}$ | 1.18014 | 489.698 | 1.01119 | 0.0000485308 |
| 0 | 1.19813 | $9.25701\times10^{-7}$ | 1.17971 | 543.561 | 1.01649 | 0.0000721327 |
| 0 | 1.22983 | -0.0000270777 | 1.18067 | 565.605 | 1.02029 | 0.0000272265 |
| 0 | 1.22275 | $-2.64889\times10^{-6}$ | 1.17259 | 607.984 | 1.05146 | 0.0000850015 |
| 0 | 1.27015 | $-6.71884\times10^{-6}$ | 1.16874 | 658.861 | 1.04685 | 0.0000691854 |
| 0 | 1.25445 | -0.0000313232 | 1.1705 | 676.953 | 1.04907 | 0.000049795 |
| 0 | 1.23622 | -0.0000499755 | 1.16953 | 707.968 | 1.07292 | 0.0000535814 |
| 0 | 1.33448 | -0.0000150746 | 1.17025 | 780.272 | 1.08585 | 0.0000660184 |
| 0 | 1.25076 | -0.0000582699 | 1.1738 | 781.519 | 1.09999 | 0.0000589837 |
| 0 | 1.31483 | -0.0000513726 | 1.16775 | 849.385 | 1.11737 | 0.0000294937 |
| 0 | 1.28786 | -0.0000374691 | 1.16884 | 916.608 | 1.12462 | 0.000042852 |
| 0 | 1.34284 | -0.000064174 | 1.16589 | 953.838 | 1.12145 | 0.0000379552 |
| 0 | 1.37989 | -0.0000637596 | 1.16611 | 1021.65 | 1.15295 | 0.0000523187 |
| 0 | 1.35635 | -0.0000476388 | 1.16671 | 1099.47 | 1.17844 | 0.0000334427 |
| 0 | 1.33561 | -0.0000648453 | 1.168 | 1112.53 | 1.18523 | 0.0000156131 |
| 0 | 1.44817 | -0.0000814491 | 1.16272 | 1192.33 | 1.21007 | 0.0000245519 |
| 0 | 1.44761 | -0.0000666517 | 1.16829 | 1258.54 | 1.23017 | 0.0000322476 |
| 0 | 1.4199 | -0.0000837338 | 1.16313 | 1294.24 | 1.25284 | 0.0000210265 |
| 0 | 1.50385 | -0.0000712152 | 1.16689 | 1419.56 | 1.26423 | 0.0000276989 |
| 0 | 1.51424 | -0.0000469458 | 1.16276 | 1541.43 | 1.26574 | 0.0000358792 |
| 0 | 1.49847 | -0.0000645551 | 1.16061 | 1606.93 | 1.25693 | $8.87966\times10^{-6}$ |
| 0 | 1.58133 | -0.0000505888 | 1.16055 | 1718.8 | 1.32803 | 0.0000193155 |
| 0 | 1.5587 | -0.0000556218 | 1.16277 | 1814.53 | 1.3286 | 0.0000207235 |
| 0 | 1.64667 | -0.0000453982 | 1.15956 | 1935.97 | 1.3485 | 0.0000353428 |
| 0 | 1.58038 | -0.0000429444 | 1.1614 | 2073.73 | 1.39008 | 0.0000226635 |
| 0 | 1.6161 | -0.0000511184 | 1.15791 | 2266.79 | 1.39527 | $3.71883\times10^{-6}$ |
| 0 | 1.66205 | -0.0000488174 | 1.1594 | 2298.89 | 1.4032 | 0.0000166111 |
| 0 | 1.72567 | -0.0000203897 | 1.15495 | 3763.44 | 1.45666 | 0.0000207207 |
| 0 | 1.71616 | -0.00001406 | 1.15504 | 3926.2 | 1.44402 | $8.87565\times10^{-6}$ |
| 0 | 1.70333 | -0.0000261031 | 1.15462 | 3821.8 | 1.49464 | 0.0000166258 |
| 0 | 1.72687 | -0.0000185475 | 1.1529 | 4340.8 | 1.50552 | 0.0000381542 |
| 0 | 1.70653 | -0.0000115434 | 1.15353 | 4740.63 | 1.50283 | 0.0000255896 |
| 0 | 1.71725 | -0.0000148476 | 1.15581 | 4690.11 | 1.51889 | 0.000022936 |
| 0 | 1.74282 | $-6.57988\times10^{-6}$ | 1.15505 | 5596.16 | 1.49296 | 0.0000108322 |
| 0 | 1.76804 | $-4.82581\times10^{-6}$ | 1.15565 | 6254.55 | 1.56226 | 0.000040008 |
| 0 | 1.79652 | -0.0000222172 | 1.15937 | 4856.52 | 1.49612 | $1.74641\times10^{-19}$ |
| 0 | 1.84374 | $-9.33158\times10^{-6}$ | 1.15136 | 5935.93 | 1.54741 | 0.0000385243 |
| 0 | 1.79042 | -0.0000141365 | 1.15465 | 5777.94 | 1.55235 | 0.0000172261 |
| 0 | 1.7835 | $-9.31843\times10^{-6}$ | 1.15575 | 6061.11 | 1.53071 | 0.0000292568 |
| 0 | 1.78296 | -0.0000138776 | 1.15383 | 6128.09 | 1.514 | 0.000023404 |
| 0 | 1.85882 | -0.0000112744 | 1.15518 | 6607.89 | 1.62374 | 0.0000204983 |
| 0 | 1.93896 | $-6.33133\times10^{-6}$ | 1.15512 | 7726.18 | 1.56144 | 0.000049986 |
| 0 | 1.85912 | $-3.03423\times10^{-6}$ | 1.15605 | 7803.44 | 1.58376 | 0.0000623857 |
| 0 | 1.92256 | $-7.43901\times10^{-6}$ | 1.15647 | 8080.7 | 1.62193 | 0.0000467812 |
| 0 | 1.85273 | $-3.38616\times10^{-6}$ | 1.15384 | 8630.01 | 1.565 | 0.0000919298 |
| 0 | 1.9399 | $-6.08046\times10^{-7}$ | 1.1551 | 9264.47 | 1.56965 | 0.0000840227 |

Out[471]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.994286 | -0.00187574 | 0.645823 | 2.8488 | 1. | -0.00359167 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.00977 | −0.00290177 | 0.871829 | 2.74327 | 1. | −0.00259525 |
| 0 | 0.978054 | −0.002144 | 0.904943 | 2.43635 | 1.00003 | −0.003 |
| 0 | 1.01418 | −0.003 | 1.06848 | 4.8761 | 0.999925 | −0.00138057 |
| 0 | 0.991622 | −0.003 | 1.04072 | 1.85341 | 1.00005 | −0.003 |
| 0 | 0.931829 | −0.00173111 | 0.947306 | 5.90592 | 1. | −0.001 |
| 0 | 0.978691 | −0.00253321 | 1.31264 | 4.06491 | 1.00019 | −0.00217677 |
| 0 | 0.99017 | −0.0017823 | 1.20212 | 5.80861 | 0.9999 | −0.00154994 |
| 0 | 1.04326 | −0.00192719 | 1.13148 | 8.00675 | 1.00053 | −0.00181676 |
| 0 | 1.02132 | −0.0021331 | 1.19756 | 6.81545 | 1. | −0.00203489 |
| 0 | 0.999129 | −0.00208057 | 1.3109 | 8.52728 | 1.00041 | −0.001 |
| 0 | 1.00988 | −0.00148697 | 1.40698 | 11.0586 | 1. | −0.001 |
| 0 | 1.01928 | −0.00100126 | 1.39689 | 14.4026 | 1.00058 | $-1.61992\times10^{-}$ |
| 0 | 0.990813 | −0.00170684 | 1.46955 | 11.8028 | 1.00009 | −0.001 |
| 0 | 1.01619 | −0.00142948 | 1.53538 | 13.6588 | 1.00063 | −0.001 |
| 0 | 0.995949 | −0.00167512 | 1.56036 | 14.813 | 1.00033 | $-6.37273\times10^{-}$ |
| 0 | 1.05644 | −0.00139721 | 1.61322 | 15.7763 | 1.00163 | −0.000278243 |
| 0 | 0.941183 | −0.00108529 | 1.5944 | 17.3833 | 1.00158 | −0.00033593 |
| 0 | 0.995376 | −0.0013454 | 1.70373 | 19.815 | 1.00483 | −0.000365723 |
| 0 | 0.991245 | −0.00157015 | 1.65576 | 19.2618 | 1.00353 | −0.000560259 |
| 0 | 1.01421 | −0.00122701 | 1.70105 | 22.5662 | 1.00134 | $-8.78065\times10^{-}$ |
| 0 | 1.01139 | −0.00130025 | 1.73503 | 25.2543 | 1.00907 | $1.65741\times10^{-16}$ |
| 0 | 1.068 | −0.00136166 | 1.7622 | 27.1092 | 1.01165 | $-5.88685\times10^{-}$ |
| 0 | 1.00805 | −0.00122687 | 1.75536 | 29.8453 | 1.0137 | −0.0002046 |
| 0 | 1.05986 | −0.00148157 | 1.81781 | 29.3335 | 1.02765 | $-2.80568\times10^{-}$ |
| 0 | 1.0948 | −0.00179749 | 1.81917 | 31.2993 | 1.03715 | $1.80244\times10^{-17}$ |
| 0 | 1.03717 | −0.00174213 | 1.82845 | 34.0667 | 1.04127 | $-3.40703\times10^{-}$ |
| 0 | 1.08844 | −0.00202876 | 1.87302 | 33.9401 | 1.06875 | $4.35673\times10^{-16}$ |
| 0 | 1.15146 | −0.00189946 | 1.89085 | 37.9062 | 1.10039 | $1.68515\times10^{-16}$ |
| 0 | 1.07571 | −0.00236146 | 1.90199 | 37.0537 | 1.08985 | −0.00014722 |
| 0 | 1.25739 | −0.00238827 | 1.90786 | 39.0865 | 1.15409 | $-2.61585\times10^{-}$ |
| 0 | 1.09768 | $-1.76901\times10^{-16}$ | 1.23966 | 94.1267 | 1.00001 | 0.0000220549 |
| 0 | 1.04386 | −0.0000655232 | 1.2259 | 103.566 | 1.00015 | $-1.84564\times10^{-}$ |
| 0 | 1.03566 | 0.0000249312 | 1.27441 | 120.625 | 1.00009 | 0.0000126612 |
| 0 | 1.04338 | −0.0001 | 1.25368 | 128.423 | 1. | −0.0001 |
| 0 | 1.05362 | $-1.94022\times10^{-17}$ | 1.23222 | 150.744 | 1.00005 | $8.04681\times10^{-6}$ |
| 0 | 1.09461 | −0.0000448111 | 1.21137 | 171.765 | 1.00008 | $-2.3958\times10^{-16}$ |
| 0 | 1.06456 | $5.85033\times10^{-18}$ | 1.21525 | 182.84 | 1.00003 | $2.89882\times10^{-15}$ |
| 0 | 1.10898 | $-1.83709\times10^{-17}$ | 1.21043 | 217.132 | 1.00005 | $2.32872\times10^{-16}$ |
| 0 | 1.08967 | $5.93519\times10^{-6}$ | 1.17499 | 313.787 | 1.00144 | $1.64117\times10^{-17}$ |
| 0 | 1.11246 | −0.0000239972 | 1.18012 | 328.897 | 1.00028 | $-6.31773\times10^{-}$ |
| 0 | 1.0718 | $-8.16947\times10^{-6}$ | 1.17087 | 352.959 | 1.00086 | $7.09742\times10^{-6}$ |
| 0 | 1.05791 | −0.0000470917 | 1.16785 | 379.066 | 1.00021 | $-3.68633\times10^{-}$ |
| 0 | 1.07512 | −0.0000280238 | 1.1694 | 400.381 | 1.00181 | $3.21956\times10^{-16}$ |
| 0 | 1.07429 | −0.000054872 | 1.16364 | 423.373 | 1.00146 | $-2.40792\times10^{-}$ |
| 0 | 1.13139 | −0.0000455107 | 1.16834 | 458.383 | 1.00223 | 0.00001259 |
| 0 | 1.10157 | −0.0000792463 | 1.16871 | 471.951 | 1.00272 | −0.000035163 |
| 0 | 1.09995 | −0.000040899 | 1.16533 | 514.289 | 1.00956 | 0.0000193617 |
| 0 | 1.11828 | −0.0000710333 | 1.16631 | 535.294 | 1.00818 | $1.25556\times10^{-16}$ |
| 0 | 1.10442 | −0.0000671608 | 1.16013 | 580.302 | 1.01578 | 0.0000232255 |
| 0 | 1.14221 | −0.0000686505 | 1.16131 | 607.203 | 1.02074 | $-4.54598\times10^{-}$ |
| 0 | 1.12157 | −0.0000866342 | 1.16342 | 635.287 | 1.03096 | $-9.48604\times10^{-}$ |
| 0 | 1.13102 | −0.0000850992 | 1.15948 | 683.338 | 1.04489 | $-2.66899\times10^{-}$ |
| 0 | 1.22208 | −0.0000873839 | 1.15843 | 738.948 | 1.0548 | 0.0000193324 |
| 0 | 1.17257 | −0.000114319 | 1.16403 | 722.683 | 1.06807 | $2.077\times10^{-16}$ |
| 0 | 1.20596 | −0.000107127 | 1.15809 | 793.169 | 1.06618 | $-5.93501\times10^{-}$ |
| 0 | 1.19634 | −0.0000785821 | 1.15952 | 853.482 | 1.08109 | $-1.25311\times10^{-}$ |
| 0 | 1.26198 | −0.000105131 | 1.15556 | 865.87 | 1.08926 | $-6.09299\times10^{-}$ |
| 0 | 1.25912 | −0.0001 | 1.15762 | 902.058 | 1.10014 | $-2.24767\times10^{-}$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.24878 | −0.0001 | 1.15333 | 975.28 | 1.14778 | $-4.09527\times10^{-}$ |
| 0 | 1.23012 | −0.000130469 | 1.15722 | 999.814 | 1.14473 | −0.0000136147 |
| 0 | 1.30868 | −0.0001 | 1.15642 | 1087.79 | 1.1559 | −0.0000191274 |
| 0 | 1.30891 | −0.000122399 | 1.16044 | 1135.83 | 1.15382 | $-2.43137\times10^{-}$ |
| 0 | 1.27307 | −0.00011149 | 1.15464 | 1142.45 | 1.18705 | $-2.23501\times10^{-}$ |
| 0 | 1.3876 | −0.000113091 | 1.15876 | 1223.14 | 1.21909 | $-2.11464\times10^{-}$ |
| 0 | 1.38483 | −0.0000819689 | 1.15444 | 1441.51 | 1.20545 | $-5.42807\times10^{-}$ |
| 0 | 1.34011 | −0.000119338 | 1.15542 | 1439.34 | 1.19459 | −0.0000169135 |
| 0 | 1.40985 | −0.0001 | 1.15279 | 1493.25 | 1.24958 | −0.0000180957 |
| 0 | 1.42588 | −0.000100573 | 1.15577 | 1549.24 | 1.27952 | $-1.83561\times10^{-}$ |
| 0 | 1.53021 | −0.000100869 | 1.15296 | 1639.89 | 1.28344 | $-1.88275\times10^{-}$ |
| 0 | 1.47219 | −0.0001 | 1.15077 | 1667.19 | 1.28555 | $-1.28696\times10^{-}$ |
| 0 | 1.46762 | −0.0000934828 | 1.14993 | 2042.67 | 1.29418 | $-2.85939\times10^{-}$ |
| 0 | 1.51523 | −0.000102091 | 1.15126 | 1848.35 | 1.32285 | $-8.78853\times10^{-}$ |
| 0 | 1.59565 | −0.0001 | 1.14465 | 2748.15 | 1.34111 | $-2.55712\times10^{-}$ |
| 0 | 1.5961 | −0.0000504095 | 1.1497 | 3103.32 | 1.36309 | $-2.48317\times10^{-}$ |
| 0 | 1.59521 | −0.000108424 | 1.14867 | 2550.92 | 1.44244 | $-3.52179\times10^{-}$ |
| 0 | 1.5946 | −0.000100777 | 1.1442 | 2783.9 | 1.39443 | $-9.69407\times10^{-}$ |
| 0 | 1.62072 | −0.0000391857 | 1.1433 | 3642.72 | 1.4288 | $-2.01738\times10^{-}$ |
| 0 | 1.57137 | −0.000103808 | 1.14773 | 2807.95 | 1.42067 | $-2.82081\times10^{-}$ |
| 0 | 1.61749 | −0.0000364037 | 1.151 | 3858.17 | 1.39239 | $-3.14996\times10^{-}$ |
| 0 | 1.65324 | −0.0000244011 | 1.15013 | 4204.2 | 1.40623 | $2.04381\times10^{-6}$ |
| 0 | 1.64069 | −0.000106197 | 1.15273 | 3063.95 | 1.39735 | $-6.67497\times10^{-}$ |
| 0 | 1.68795 | −0.0000336302 | 1.14703 | 4092.04 | 1.43785 | $-1.46836\times10^{-}$ |
| 0 | 1.5845 | −0.0000411204 | 1.15057 | 4495.46 | 1.44565 | $-5.12155\times10^{-}$ |
| 0 | 1.63689 | −0.0000585174 | 1.14752 | 4217.98 | 1.4458 | $-2.01355\times10^{-}$ |
| 0 | 1.62464 | −0.0000350573 | 1.14671 | 4238.53 | 1.43341 | $-5.98031\times10^{-}$ |
| 0 | 1.6894 | −0.000104394 | 1.14773 | 3319.7 | 1.49339 | $-4.94037\times10^{-}$ |
| 0 | 1.70906 | −0.0000470329 | 1.14519 | 4067.82 | 1.4452 | $-8.48079\times10^{-}$ |
| 0 | 1.73507 | −0.0000311586 | 1.1502 | 5216.33 | 1.48188 | $-1.10579\times10^{-}$ |
| 0 | 1.71832 | −0.00010266 | 1.14722 | 3524.71 | 1.53093 | $-1.91495\times10^{-}$ |
| 0 | 1.67424 | −0.0000175849 | 1.14655 | 7077.04 | 1.46871 | $-1.74326\times10^{-}$ |
| 0 | 1.74662 | −0.000025009 | 1.14688 | 6138.91 | 1.48425 | $-4.15838\times10^{-}$ |
| 0 | 1.73442 | −0.0001 | 1.14926 | 4327.05 | 1.44759 | $-8.52837\times10^{-}$ |

Out[472]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.17119 | 0.00329428 | 3.36612 | 19.8873 | 1.01097 | 0.003 |
| 0 | 1.23869 | 0.00236011 | 3.13259 | 14.6166 | 1.00401 | 0.00318963 |
| 0 | 1.15823 | 0.00156385 | 4.08575 | 14.3406 | 1.01118 | 0.00222054 |
| 0 | 1.22009 | 0.00180697 | 2.24082 | 13.8813 | 1.0074 | 0.003 |
| 0 | 1.16053 | 0.001 | 5.34572 | 15.07 | 1.00698 | 0.00245649 |
| 0 | 1.24889 | 0.00134242 | 2.14438 | 18.6104 | 1.00271 | 0.002 |
| 0 | 1.15672 | 0.000496908 | 3.18199 | 13.0174 | 1.00846 | 0.00197307 |
| 0 | 1.16789 | 0.00116986 | 2.46421 | 16.2365 | 1.00668 | 0.002 |
| 0 | 1.20812 | 0.001 | 2.05582 | 18.4001 | 1.01213 | 0.00219125 |
| 0 | 1.17113 | 0.001 | 2.39293 | 19.5161 | 1.008 | 0.00269529 |
| 0 | 1.22164 | 0.001 | 2.19635 | 18.7216 | 1.01249 | 0.00266578 |
| 0 | 1.22603 | 0.000584381 | 1.9778 | 17.7419 | 1.00623 | 0.0013569 |
| 0 | 1.1957 | 0.001 | 1.71376 | 20.2296 | 1.01239 | 0.00149344 |
| 0 | 1.2166 | 0.000805681 | 2.08449 | 20.1613 | 1.00627 | 0.00190645 |
| 0 | 1.19031 | 0.000197609 | 1.99788 | 20.2329 | 1.01366 | 0.00105799 |
| 0 | 1.21048 | 0.000355215 | 1.96726 | 22.2892 | 1.01616 | 0.00182072 |
| 0 | 1.26288 | 0.000662382 | 2.01795 | 22.5643 | 1.01843 | 0.002 |
| 0 | 1.20101 | 0.000701006 | 1.96161 | 25.9295 | 1.02305 | 0.00190875 |
| 0 | 1.17338 | $-4.03457\times10^{-16}$ | 1.92976 | 25.7844 | 1.02407 | 0.00130855 |
| 0 | 1.21469 | 0.000220903 | 1.98787 | 28.3548 | 1.02935 | 0.00101295 |
| 0 | 1.18151 | $1.46597\times10^{-17}$ | 1.94048 | 30.3155 | 1.04328 | 0.00192753 |
| 0 | 1.16009 | −0.00025498 | 1.88618 | 30.7361 | 1.0486 | 0.001 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.21749 | -0.000241519 | 1.92209 | 32.991 | 1.05485 | 0.00129805 |
| 0 | 1.2032 | -0.000356142 | 1.87826 | 35.413 | 1.06375 | 0.001 |
| 0 | 1.21886 | -0.000481415 | 1.98496 | 34.843 | 1.07291 | 0.000992166 |
| 0 | 1.26433 | -0.000630501 | 1.93539 | 37.3269 | 1.10457 | 0.001 |
| 0 | 1.28944 | -0.000691581 | 1.93931 | 39.3445 | 1.10949 | 0.001 |
| 0 | 1.26821 | -0.001 | 1.98369 | 40.4625 | 1.13447 | 0.001 |
| 0 | 1.31654 | -0.00123822 | 1.96668 | 42.9787 | 1.1783 | 0.000807183 |
| 0 | 1.28235 | -0.00109002 | 1.99299 | 42.853 | 1.2015 | 0.000741295 |
| 0 | 1.45427 | -0.00115914 | 2.00521 | 45.8995 | 1.27975 | 0.000727888 |
| 0 | 1.30832 | 0.0003 | 1.51753 | 131.555 | 1.00303 | 0.0004 |
| 0 | 1.31781 | 0.000235511 | 1.4729 | 147.753 | 1.00298 | 0.0003 |
| 0 | 1.22296 | 0.000225336 | 1.44797 | 149.704 | 1.00363 | 0.000243125 |
| 0 | 1.30156 | 0.000197485 | 1.42875 | 161.886 | 1.00286 | 0.000208324 |
| 0 | 1.23876 | 0.000256123 | 1.34994 | 185.571 | 1.00405 | 0.000358687 |
| 0 | 1.30843 | 0.000174823 | 1.32248 | 205.09 | 1.00607 | 0.0002 |
| 0 | 1.21164 | 0.000213409 | 1.32761 | 234.028 | 1.00864 | 0.000275243 |
| 0 | 1.27121 | 0.000214983 | 1.27899 | 246.852 | 1.00883 | 0.00023541 |
| 0 | 1.28896 | 0.000153606 | 1.21937 | 359.136 | 1.01417 | 0.0002 |
| 0 | 1.29911 | 0.000100689 | 1.21489 | 375.699 | 1.01062 | 0.000136317 |
| 0 | 1.28761 | 0.000136037 | 1.20326 | 414.377 | 1.01354 | 0.000211885 |
| 0 | 1.21178 | 0.000118729 | 1.2038 | 440.274 | 1.01066 | 0.000166324 |
| 0 | 1.2693 | 0.0000865771 | 1.20203 | 457.112 | 1.01679 | 0.000151631 |
| 0 | 1.32043 | 0.000083512 | 1.19868 | 492.985 | 1.01692 | 0.000143676 |
| 0 | 1.31173 | 0.000103569 | 1.19205 | 513.619 | 1.01384 | 0.000154508 |
| 0 | 1.28446 | 0.000049502 | 1.19206 | 542.144 | 1.03227 | 0.000116793 |
| 0 | 1.27494 | 0.0000371682 | 1.19233 | 568.526 | 1.03408 | 0.000125932 |
| 0 | 1.34914 | $1.69103 \times 10^{-18}$ | 1.19275 | 605.01 | 1.05177 | 0.0001 |
| 0 | 1.33516 | 0.0000265003 | 1.18082 | 656.428 | 1.07678 | 0.000150376 |
| 0 | 1.34899 | 0.0000324019 | 1.1847 | 692.853 | 1.07486 | 0.000145444 |
| 0 | 1.32203 | $6.46076 \times 10^{-6}$ | 1.18264 | 729.362 | 1.09386 | 0.000106449 |
| 0 | 1.32478 | $4.43586 \times 10^{-17}$ | 1.17887 | 763.419 | 1.12544 | 0.000110014 |
| 0 | 1.43531 | $8.75972 \times 10^{-6}$ | 1.17746 | 839.606 | 1.11701 | 0.000112903 |
| 0 | 1.34626 | $-1.07379 \times 10^{-7}$ | 1.1826 | 827.351 | 1.14683 | 0.000114378 |
| 0 | 1.45147 | $2.84401 \times 10^{-19}$ | 1.18313 | 928.114 | 1.14489 | 0.0000929123 |
| 0 | 1.38565 | $-2.24857 \times 10^{-6}$ | 1.17832 | 987.252 | 1.18147 | 0.0000944725 |
| 0 | 1.4312 | -0.000021085 | 1.17512 | 1041.2 | 1.17062 | 0.0000838974 |
| 0 | 1.47683 | $-1.22318 \times 10^{-6}$ | 1.17707 | 1141.92 | 1.21873 | 0.0000885466 |
| 0 | 1.48918 | $-4.5505 \times 10^{-6}$ | 1.17437 | 1146.69 | 1.23344 | 0.0000837252 |
| 0 | 1.52844 | -0.0000173512 | 1.17733 | 1213.29 | 1.26766 | 0.0000659648 |
| 0 | 1.58472 | -0.0000266675 | 1.17204 | 1303.69 | 1.24536 | 0.0000654151 |
| 0 | 1.55411 | -0.0000255591 | 1.17341 | 1341.63 | 1.29512 | 0.0000572104 |
| 0 | 1.53345 | -0.0000340661 | 1.17114 | 1451.52 | 1.30897 | 0.0000537536 |
| 0 | 1.58619 | -0.0000233077 | 1.17286 | 1517.85 | 1.35955 | 0.0000560558 |
| 0 | 1.58162 | -0.0000149059 | 1.17148 | 1768.03 | 1.37546 | 0.000062982 |
| 0 | 1.59392 | -0.0000207308 | 1.16733 | 1806.43 | 1.38466 | 0.0000383031 |
| 0 | 1.71357 | -0.000012645 | 1.16974 | 1918.45 | 1.39929 | 0.0000535632 |
| 0 | 1.70023 | -0.0000118497 | 1.17121 | 2119.87 | 1.38952 | 0.000042002 |
| 0 | 1.79438 | -0.0000200252 | 1.16792 | 2260.55 | 1.4786 | 0.0000572648 |
| 0 | 1.67962 | -0.000015212 | 1.17032 | 2372.06 | 1.44319 | 0.0000449719 |
| 0 | 1.78155 | $-4.19447 \times 10^{-6}$ | 1.16557 | 2669.39 | 1.44053 | 0.0000418423 |
| 0 | 1.80219 | -0.0000108886 | 1.16613 | 2804.69 | 1.4543 | 0.000050356 |
| 0 | 1.8947 | $-7.40773 \times 10^{-18}$ | 1.16436 | 4552.28 | 1.57067 | 0.0000562397 |
| 0 | 1.82776 | $-6.06826 \times 10^{-18}$ | 1.16261 | 4749.85 | 1.55871 | 0.0000556168 |
| 0 | 1.8506 | $-4.25237 \times 10^{-6}$ | 1.16589 | 4835.8 | 1.61831 | 0.0000512618 |
| 0 | 1.88115 | $-4.99647 \times 10^{-18}$ | 1.16289 | 5358.01 | 1.59021 | 0.0000587965 |
| 0 | 1.81777 | $-1.02027 \times 10^{-17}$ | 1.16302 | 5547.91 | 1.62564 | 0.0000666276 |
| 0 | 1.89185 | $-2.5426 \times 10^{-6}$ | 1.16496 | 5926.43 | 1.60671 | 0.0000555703 |
| 0 | 1.92674 | $-5.72976 \times 10^{-18}$ | 1.15979 | 6470.04 | 1.6103 | 0.0000463776 |
| 0 | 1.92304 | $-3.20421 \times 10^{-19}$ | 1.16351 | 7555.3 | 1.63168 | 0.0000934293 |
| 0 | 1.95992 | $-3.30808 \times 10^{-6}$ | 1.16714 | 6326.96 | 1.66791 | 0.0000659805 |
| 0 | 1.91105 | $-1.08913 \times 10^{-16}$ | 1.15966 | 7289.85 | 1.70503 | 0.0000955501 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.92876 | $-4.40815\times10^{-18}$ | 1.16345 | 7449.11 | 1.64224 | 0.0000939184 |
| 0 | 1.93337 | $-1.95651\times10^{-8}$ | 1.16152 | 7845.03 | 1.63125 | 0.0000747447 |
| 0 | 1.89086 | $-5.54473\times10^{-19}$ | 1.16211 | 7940.49 | 1.60936 | 0.0000923742 |
| 0 | 2.02154 | $-1.03245\times10^{-6}$ | 1.16199 | 8587.4 | 1.77272 | 0.0000953774 |
| 0 | 2.04807 | $-1.43424\times10^{-18}$ | 1.16761 | 9343.12 | 1.67571 | 0.0000957039 |
| 0 | 2.01059 | $1.55796\times10^{-19}$ | 1.16162 | 9574.91 | 1.74314 | 0.0000959739 |
| 0 | 2.05153 | $-4.71759\times10^{-17}$ | 1.16559 | 9807.45 | 1.73196 | 0.0000934897 |
| 0 | 2.1366 | $-3.84821\times10^{-18}$ | 1.16406 | 10319.8 | 1.74516 | 0.000094964 |
| 0 | 2.12799 | $-1.85891\times10^{-18}$ | 1.16047 | 11357.9 | 1.67542 | 0.0000945195 |
| 0 | 2.02113 | $-1.64855\times10^{-18}$ | 1.16719 | 12555. | 1.75913 | 0.0000935201 |

## D

In[473]:=
```
Transpose[simParamMedianD] // TableForm
Transpose[simParamQuantile1D] // TableForm
Transpose[simParamQuantile2D] // TableForm
```

Out[473]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.09769 | $1.87869\times10^{-15}$ | 1.1823 | 7.58585 | 1.00118 | 0.000625005 |
| 0 | 1.09671 | -0.0000293686 | 1.29619 | 7.57391 | 1.00062 | 0.001 |
| 0 | 1.07649 | $-9.27033\times10^{-6}$ | 1.32465 | 8.45938 | 1.00056 | -0.000186899 |
| 0 | 1.06399 | -0.000893838 | 1.27918 | 8.57978 | 1.0011 | 0.0000932331 |
| 0 | 1.12461 | -0.00057619 | 1.46524 | 7.43204 | 1.00077 | 0.000343277 |
| 0 | 1.10836 | 0.000261144 | 1.51704 | 9.11126 | 1.00098 | 0.001 |
| 0 | 1.11281 | -0.0000128732 | 1.24498 | 12.3632 | 1.00439 | 0.000789922 |
| 0 | 1.02619 | -0.001 | 1.65019 | 9.33959 | 1.00159 | $-1.33233\times10^{-15}$ |
| 0 | 1.14442 | -0.0000755126 | 1.44731 | 11.8692 | 1.00115 | 0.001 |
| 0 | 1.043 | -0.001 | 1.65509 | 10.3721 | 1.00098 | -0.001 |
| 0 | 1.09892 | $1.45885\times10^{-15}$ | 1.48762 | 14.3378 | 1.00274 | 0.000793396 |
| 0 | 1.07438 | -0.00106938 | 1.82951 | 11.3296 | 1.00108 | -0.00024307 |
| 0 | 1.11065 | -0.000307637 | 1.69026 | 13.7491 | 1.00501 | 0.000872905 |
| 0 | 1.11479 | -0.000487658 | 1.66276 | 14.9429 | 1.00346 | 0.000489835 |
| 0 | 1.1245 | -0.000356921 | 1.66296 | 16.7947 | 1.00536 | 0.000387479 |
| 0 | 1.11033 | -0.0000960106 | 1.58343 | 19.4845 | 1.00648 | 0.000702896 |
| 0 | 1.11823 | -0.000456116 | 1.69824 | 19.338 | 1.00829 | 0.000533835 |
| 0 | 1.06894 | -0.000382637 | 1.73908 | 20.4006 | 1.00777 | 0.000763145 |
| 0 | 1.0926 | -0.000463577 | 1.78202 | 21.5633 | 1.00767 | 0.000719191 |
| 0 | 1.07298 | -0.000652867 | 1.70656 | 25.047 | 1.01105 | 0.000327977 |
| 0 | 1.10049 | -0.00054309 | 1.73834 | 25.6649 | 1.00964 | 0.000799241 |
| 0 | 1.0859 | -0.000425482 | 1.82562 | 25.6854 | 1.013 | 0.000742183 |
| 0 | 1.10741 | -0.000533794 | 1.81938 | 27.6354 | 1.01919 | 0.000546179 |
| 0 | 1.07895 | -0.001 | 1.85776 | 29.4293 | 1.01755 | $-2.28321\times10^{-17}$ |
| 0 | 1.12868 | -0.001 | 1.87676 | 29.8839 | 1.02837 | 0.000579547 |
| 0 | 1.14884 | -0.00110644 | 1.85894 | 32.6714 | 1.03855 | 0.00058256 |
| 0 | 1.15309 | -0.00104715 | 1.87054 | 35.4955 | 1.0622 | 0.000468743 |
| 0 | 1.21197 | -0.00109673 | 1.87822 | 37.3683 | 1.08386 | 0.00054501 |
| 0 | 1.17745 | -0.00135346 | 1.91589 | 38.1451 | 1.09222 | 0.000310518 |
| 0 | 1.21399 | -0.00162079 | 1.93678 | 39.2497 | 1.12735 | 0.000448465 |
| 0 | 1.24643 | -0.00187227 | 1.93544 | 40.7253 | 1.16475 | 0.000372814 |
| 0 | 1.29849 | -0.002 | 1.97338 | 41.2547 | 1.19836 | 0.000379634 |
| 0 | 0.0472294 | 0.0000953915 | 1.38108 | 107.322 | 1.004 | 0.0000874062 |
| 0 | 0.0494208 | 0.0000899691 | 1.34633 | 122.31 | 1.00777 | 0.0000810902 |
| 0 | 0.0484651 | 0.0000897343 | 1.33286 | 133.778 | 1.01137 | 0.0000829507 |
| 0 | 0.0505054 | 0.000083736 | 1.30474 | 150.646 | 1.01416 | 0.000070633 |
| 0 | 0.0502545 | 0.0000900843 | 1.28838 | 167.936 | 1.02111 | 0.0000744983 |
| 0 | 0.0505467 | 0.0000877366 | 1.27222 | 185.453 | 1.02879 | 0.0000719022 |
| 0 | 0.0483035 | 0.0000735909 | 1.26428 | 204.95 | 1.03252 | 0.0000483571 |
| 0 | 0.0502392 | 0.000080179 | 1.24599 | 227.987 | 1.02732 | 0.0000513977 |
| 0 | 0.0499597 | 0.0000704176 | 1.19474 | 334.132 | 1.00365 | 0.0000730606 |
| 0 | 0.0495647 | 0.0000655521 | 1.19238 | 356.557 | 1.0112 | 0.0000753285 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.052892 | 0.0000438287 | 1.19124 | 377.532 | 1.01717 | 0.0000613515 |
| 0 | 0.0553953 | 0.0000387266 | 1.18711 | 402.992 | 1.05011 | 0.0000630185 |
| 0 | 0.0557244 | 0.0000289145 | 1.18542 | 428.778 | 1.08399 | 0.0000616691 |
| 0 | 0.05822 | 0.000023343 | 1.18239 | 454.964 | 1.11779 | 0.0000598958 |
| 0 | 0.0625089 | $6.7165\times10^{-6}$ | 1.18059 | 482.423 | 1.23501 | 0.0000596313 |
| 0 | 0.0679325 | $4.31955\times10^{-6}$ | 1.17851 | 512.262 | 1.32604 | 0.0000573802 |
| 0 | 0.0729506 | $-8.77109\times10^{-6}$ | 1.17659 | 544.882 | 1.46961 | 0.0000502076 |
| 0 | 0.083241 | -0.0000171444 | 1.17657 | 572.541 | 1.62682 | 0.0000504543 |
| 0 | 0.0913349 | -0.0000250189 | 1.17426 | 610.038 | 1.82753 | 0.0000465241 |
| 0 | 0.0991187 | -0.0000250072 | 1.17396 | 643.89 | 1.96181 | 0.0000477956 |
| 0 | 0.113061 | -0.0000364486 | 1.17169 | 678.187 | 2.27896 | 0.0000412228 |
| 0 | 0.127284 | -0.0000423434 | 1.17018 | 718.924 | 2.56044 | 0.0000386004 |
| 0 | 0.142001 | -0.0000465916 | 1.1694 | 761.828 | 2.87643 | 0.0000346618 |
| 0 | 0.15922 | -0.0000493319 | 1.17002 | 803.27 | 3.16772 | 0.0000364681 |
| 0 | 0.175699 | -0.0000546538 | 1.16889 | 849.826 | 3.53592 | 0.0000302554 |
| 0 | 0.195986 | -0.0000605746 | 1.16756 | 894.053 | 3.88579 | 0.00003012 |
| 0 | 0.206728 | -0.0000632171 | 1.16711 | 949.633 | 4.40473 | 0.0000266735 |
| 0 | 0.23034 | -0.0000648625 | 1.16619 | 1004.48 | 4.75666 | 0.0000274755 |
| 0 | 0.254967 | -0.0000685133 | 1.16621 | 1052.47 | 5.2503 | 0.0000241033 |
| 0 | 0.274759 | -0.0000677618 | 1.16502 | 1116.89 | 5.53386 | 0.0000238832 |
| 0 | 0.289865 | -0.0000678005 | 1.16358 | 1187.29 | 6.27886 | 0.00001977 |
| 0 | 0.321552 | -0.0000636512 | 1.16266 | 1267.59 | 6.74811 | 0.0000228038 |
| 0 | 0.336159 | -0.0000656067 | 1.16342 | 1325.14 | 7.09809 | 0.0000199087 |
| 0 | 0.352956 | -0.0000647937 | 1.16243 | 1434.12 | 7.71924 | 0.0000181679 |
| 0 | 0.376733 | -0.0000642275 | 1.16176 | 1494.96 | 8.0096 | 0.0000191482 |
| 0 | 0.402996 | -0.0000593747 | 1.16107 | 1607.62 | 8.58422 | 0.0000195968 |
| 0 | 0.418932 | -0.0000570356 | 1.16052 | 1719.49 | 9.00232 | 0.0000183114 |
| 0 | 0.44149 | -0.0000547357 | 1.15986 | 1817.61 | 9.46353 | 0.0000188815 |
| 0 | 0.456117 | -0.0000475781 | 1.15915 | 1976.61 | 9.74644 | 0.0000194743 |
| 0 | 0.477314 | -0.0000460861 | 1.15783 | 2099.84 | 10.2936 | 0.0000199446 |
| 0 | 0.491323 | -0.0000412377 | 1.15763 | 2270.13 | 10.8048 | 0.0000185595 |
| 0 | 0.50674 | -0.0000373287 | 1.15791 | 2416.73 | 10.5676 | 0.0000178807 |
| 0 | 0.60121 | -0.000018003 | 1.15252 | 3955.62 | 13.1975 | 0.0000161987 |
| 0 | 0.608569 | -0.0000151029 | 1.15312 | 4270.83 | 13.4361 | 0.0000162721 |
| 0 | 0.625161 | -0.0000132196 | 1.15257 | 4467.92 | 13.138 | 0.0000178091 |
| 0 | 0.640667 | -0.0000135416 | 1.15227 | 4690.78 | 13.5017 | 0.0000190236 |
| 0 | 0.638936 | -0.000010853 | 1.15293 | 4914.26 | 14.2234 | 0.0000208109 |
| 0 | 0.644038 | -0.0000102484 | 1.15191 | 5283.43 | 13.7735 | 0.0000217656 |
| 0 | 0.66585 | $-9.55148\times10^{-6}$ | 1.15309 | 5505.2 | 14.349 | 0.0000165557 |
| 0 | 0.667684 | $-8.36681\times10^{-6}$ | 1.15239 | 5881.54 | 14.3579 | 0.0000221331 |
| 0 | 0.66619 | $-6.86432\times10^{-6}$ | 1.15213 | 6215.57 | 14.0715 | 0.0000164896 |
| 0 | 0.690846 | $-6.98093\times10^{-6}$ | 1.15217 | 6520.58 | 14.6744 | 0.0000218162 |
| 0 | 0.688366 | $-4.73794\times10^{-6}$ | 1.15258 | 7014.68 | 14.5555 | 0.0000205427 |
| 0 | 0.691782 | $-4.34791\times10^{-6}$ | 1.15229 | 7323.12 | 14.5765 | 0.0000290492 |
| 0 | 0.692968 | $-4.04881\times10^{-6}$ | 1.1526 | 7754.86 | 14.9917 | 0.0000254374 |
| 0 | 0.694659 | $-4.79265\times10^{-6}$ | 1.15269 | 7826.1 | 15.1139 | 0.0000243565 |
| 0 | 0.715326 | $-3.85655\times10^{-6}$ | 1.15246 | 8451.51 | 15.2439 | 0.0000226732 |
| 0 | 0.717315 | $-3.16116\times10^{-6}$ | 1.15286 | 8878.69 | 15.0425 | 0.0000263021 |
| 0 | 0.720603 | $-3.07008\times10^{-6}$ | 1.15304 | 9050.17 | 15.6413 | 0.0000279645 |
| 0 | 0.735301 | $-2.07074\times10^{-6}$ | 1.15272 | 9823.68 | 15.8256 | 0.0000239932 |
| 0 | 0.740405 | $-1.53754\times10^{-6}$ | 1.15311 | 10 137.5 | 15.9014 | 0.0000366953 |
| 0 | 0.743439 | $-2.19606\times10^{-6}$ | 1.15364 | 10 348.8 | 16.1901 | 0.0000286766 |

Out[474]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.01547 | -0.003 | 0.792821 | 1.94277 | 1. | -0.003 |
| 0 | 0.975933 | -0.00255727 | 0.733829 | 1.5441 | 1. | -0.003 |
| 0 | 1.01442 | -0.00240577 | 0.794125 | 2.46862 | 1.00003 | -0.004 |
| 0 | 0.97518 | -0.003 | 0.869722 | 1.75734 | 1. | -0.00394016 |
| 0 | 1.01131 | -0.00373101 | 0.906353 | 1.90762 | 0.999999 | -0.00392054 |
| 0 | 0.958084 | -0.00277577 | 0.995956 | 3.46203 | 1.00007 | -0.004 |
| 0 | 0.991993 | -0.0023972 | 1.01959 | 9.37117 | 1.00013 | -0.001 |
| 0 | 0.946652 | -0.00269051 | 1.16914 | 3.97766 | 1.00013 | -0.00200528 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.03908 | -0.002 | 1.0799 | 7.04476 | 1.00003 | -0.003 |
| 0 | 0.944003 | -0.00222287 | 1.27651 | 5.38622 | 1.0001 | -0.002 |
| 0 | 0.993892 | -0.00153791 | 1.2614 | 10.5137 | 1.0003 | -0.001 |
| 0 | 0.970666 | -0.00225533 | 1.52166 | 7.63703 | 1.00001 | -0.002 |
| 0 | 0.990681 | -0.00229598 | 1.4967 | 10.9099 | 1.00066 | -0.001 |
| 0 | 1.02701 | -0.00141557 | 1.38322 | 12.6395 | 1.00047 | -0.001 |
| 0 | 1.00685 | -0.001 | 1.48051 | 13.3957 | 1.00088 | -0.001 |
| 0 | 1.00275 | -0.00125688 | 1.46624 | 15.6184 | 1.00191 | -0.001 |
| 0 | 0.988502 | -0.00168239 | 1.56679 | 15.0207 | 1.00305 | -0.001 |
| 0 | 0.946132 | -0.00136793 | 1.60391 | 16.5447 | 1.00132 | -0.00020030 |
| 0 | 0.993401 | -0.00121847 | 1.63655 | 17.6983 | 1.00226 | -0.00027076 |
| 0 | 0.960251 | -0.00100613 | 1.64426 | 20.8345 | 1.00092 | -0.00028936 |
| 0 | 1.00325 | -0.00143387 | 1.63806 | 22.3271 | 1.00223 | -0.00041206 |
| 0 | 1.01504 | -0.00125071 | 1.73285 | 23.953 | 1.00518 | $-1.80091\times 10$ |
| 0 | 0.954382 | -0.00132376 | 1.7186 | 24.7175 | 1.00433 | $3.28384\times 10^{-}$ |
| 0 | 0.955183 | -0.00132774 | 1.78303 | 26.7991 | 1.00466 | -0.00042108 |
| 0 | 1.07895 | -0.00184129 | 1.81437 | 28.1836 | 1.00696 | -0.00053087 |
| 0 | 1.00604 | -0.002 | 1.79873 | 29.5437 | 1.02322 | -0.00032796 |
| 0 | 1.04081 | -0.00174179 | 1.81513 | 30.7082 | 1.03163 | -0.00009387 |
| 0 | 1.10071 | -0.00166155 | 1.8241 | 34.0459 | 1.04461 | 0.00011019 |
| 0 | 1.0795 | -0.00174429 | 1.85421 | 35.9114 | 1.07063 | $-2.12221\times 10$ |
| 0 | 1.10007 | -0.00214158 | 1.89213 | 35.8449 | 1.08777 | $1.79127\times 10^{-}$ |
| 0 | 1.14555 | -0.002159 | 1.90238 | 36.5699 | 1.12022 | $4.74361\times 10^{-}$ |
| 0 | 1.18436 | -0.00228929 | 1.94486 | 39.2005 | 1.15748 | $-7.24511\times 10$ |
| 0 | 0.043891 | 0.0000545446 | 1.33125 | 104.607 | 1.00021 | 0.000042697 |
| 0 | 0.0449238 | 0.0000438672 | 1.31923 | 117.163 | 1.00055 | 0.000035809 |
| 0 | 0.0456809 | 0.0000630594 | 1.30935 | 129.617 | 1.00043 | 0.000054929 |
| 0 | 0.0447046 | 0.0000607508 | 1.28714 | 147.02 | 1.00615 | 0.000053263 |
| 0 | 0.0428022 | 0.0000653053 | 1.26958 | 165.586 | 1.00932 | 0.000052564 |
| 0 | 0.0449607 | 0.0000710576 | 1.26346 | 183.216 | 1.00775 | 0.000046984 |
| 0 | 0.0440329 | 0.0000577273 | 1.25269 | 199.882 | 1.00616 | 0.000032298 |
| 0 | 0.0456349 | 0.0000620041 | 1.23535 | 223.162 | 1.01094 | 0.000031498 |
| 0 | 0.0465006 | 0.0000566164 | 1.19259 | 329.457 | 1.00159 | 0.000060735 |
| 0 | 0.045416 | 0.0000439178 | 1.18948 | 353.701 | 1.00102 | 0.000054132 |
| 0 | 0.0482763 | 0.000032793 | 1.18897 | 372.883 | 1.00628 | 0.000048502 |
| 0 | 0.0484384 | 0.0000280769 | 1.18309 | 398.301 | 1.02989 | 0.000053744 |
| 0 | 0.0526251 | 0.0000158553 | 1.18184 | 424.544 | 1.05772 | 0.000046643 |
| 0 | 0.0536053 | 0.0000123832 | 1.17994 | 450.515 | 1.08935 | 0.000048890 |
| 0 | 0.0570289 | $-6.28477\times 10^{-18}$ | 1.1786 | 477.422 | 1.18132 | 0.000044199 |
| 0 | 0.0601719 | $-9.21187\times 10^{-6}$ | 1.17642 | 506.735 | 1.27118 | 0.000043088 |
| 0 | 0.0669803 | -0.0000172898 | 1.17471 | 537.538 | 1.38239 | 0.000041077 |
| 0 | 0.0778184 | -0.0000280351 | 1.17388 | 564.995 | 1.53464 | 0.000043902 |
| 0 | 0.0835513 | -0.0000318917 | 1.17118 | 602.767 | 1.70953 | 0.000035660 |
| 0 | 0.093517 | -0.0000371121 | 1.17165 | 635.573 | 1.85868 | 0.000035140 |
| 0 | 0.102891 | -0.0000475014 | 1.17027 | 668.011 | 1.99481 | 0.000031034 |
| 0 | 0.119643 | -0.0000493833 | 1.16778 | 709.701 | 2.37712 | 0.000028591 |
| 0 | 0.131034 | -0.0000553998 | 1.16714 | 751.359 | 2.65172 | 0.000026027 |
| 0 | 0.151586 | -0.0000562056 | 1.16761 | 786.699 | 2.90398 | 0.000028381 |
| 0 | 0.167195 | -0.0000677853 | 1.16688 | 833.958 | 3.29386 | 0.000025596 |
| 0 | 0.187907 | -0.0000694349 | 1.16606 | 880.255 | 3.68194 | 0.000023711 |
| 0 | 0.199915 | -0.000073175 | 1.16545 | 937.145 | 4.0894 | 0.000018404 |
| 0 | 0.216163 | -0.0000726512 | 1.16438 | 992.185 | 4.34312 | 0.000019093 |
| 0 | 0.24486 | -0.0000801542 | 1.16408 | 1034.62 | 4.91927 | 0.000014408 |
| 0 | 0.25826 | -0.000078487 | 1.16295 | 1093.54 | 5.0957 | 0.000016276 |
| 0 | 0.278163 | -0.0000805527 | 1.16218 | 1157.69 | 5.52426 | 0.000014249 |
| 0 | 0.299561 | -0.0000734886 | 1.16097 | 1240.95 | 6.21475 | 0.000015420 |
| 0 | 0.317293 | -0.0000750279 | 1.16167 | 1304.45 | 6.44621 | 0.000011498 |
| 0 | 0.343779 | -0.0000738692 | 1.16046 | 1386.58 | 7.01569 | 0.000013253 |
| 0 | 0.365142 | -0.0000749619 | 1.16009 | 1463.57 | 7.24732 | 0.000013130 |
| 0 | 0.388909 | -0.0000656298 | 1.15925 | 1586.97 | 8.0714 | 0.000012878 |
| 0 | 0.398507 | -0.0000695544 | 1.15842 | 1675.35 | 8.46558 | $7.08678\times 10^{-}$ |
| 0 | 0.420967 | -0.000065865 | 1.15843 | 1760.3 | 8.44162 | $7.26897\times 10^{-}$ |
| 0 | 0.440519 | -0.0000543003 | 1.15773 | 1927.52 | 9.1476 | 0.000012967 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.463843 | −0.0000510955 | 1.15673 | 2062.3 | 9.54188 | 0.000013742 |
| 0 | 0.47231 | −0.0000468979 | 1.15555 | 2178.82 | 9.97276 | 0.000011602 |
| 0 | 0.493841 | −0.0000454114 | 1.15618 | 2334.17 | 9.85463 | 0.000012312 |
| 0 | 0.578879 | −0.000021631 | 1.15025 | 3851.65 | 11.7727 | 0.000011640 |
| 0 | 0.589897 | −0.0000182996 | 1.15187 | 4055.49 | 12.1176 | 0.000011086 |
| 0 | 0.607214 | −0.0000195247 | 1.15124 | 4241.48 | 11.8655 | 0.000010290 |
| 0 | 0.61163 | −0.0000162722 | 1.15131 | 4500.7 | 12.0919 | 0.000012801 |
| 0 | 0.623717 | −0.0000138969 | 1.15142 | 4703.13 | 12.9131 | 0.000013427 |
| 0 | 0.621534 | −0.0000120541 | 1.15091 | 5103.45 | 12.7935 | 0.00001129 |
| 0 | 0.644586 | −0.0000134229 | 1.1519 | 5329.6 | 13.6413 | $9.46694\times10^{-}$ |
| 0 | 0.64937 | −0.0000102786 | 1.1508 | 5469.02 | 13.2914 | 0.000011823 |
| 0 | 0.643385 | −0.0000101703 | 1.151 | 5960.97 | 12.8699 | $6.80865\times10^{-}$ |
| 0 | 0.660523 | $-9.53012\times10^{-6}$ | 1.15019 | 6247.18 | 13.1058 | 0.000010357 |
| 0 | 0.662499 | $-7.28854\times10^{-6}$ | 1.15111 | 6596.32 | 12.8603 | $9.92582\times10^{-}$ |
| 0 | 0.673106 | $-6.86404\times10^{-6}$ | 1.15131 | 7136.43 | 13.5733 | 0.000017857 |
| 0 | 0.673386 | $-6.62544\times10^{-6}$ | 1.15146 | 7409.52 | 14.4492 | 0.000012874 |
| 0 | 0.679407 | $-6.85917\times10^{-6}$ | 1.1516 | 7570.01 | 13.8056 | $7.47847\times10^{-}$ |
| 0 | 0.701929 | $-4.93819\times10^{-6}$ | 1.15111 | 8194.86 | 14.1323 | 0.000011132 |
| 0 | 0.691582 | $-5.17026\times10^{-6}$ | 1.15102 | 8353.83 | 14.2796 | $9.63095\times10^{-}$ |
| 0 | 0.698922 | $-4.52268\times10^{-6}$ | 1.15171 | 8621.16 | 14.3952 | $5.20845\times10^{-}$ |
| 0 | 0.699918 | $-4.15181\times10^{-6}$ | 1.15157 | 9228.54 | 14.2885 | $5.40109\times10^{-}$ |
| 0 | 0.712756 | $-3.02362\times10^{-6}$ | 1.15126 | 9731.48 | 14.7933 | $1.1464\times10^{-6}$ |
| 0 | 0.713975 | $-3.29775\times10^{-6}$ | 1.15173 | 10 044.3 | 15.2123 | $5.28307\times10^{-}$ |

Out[475]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 1.20382 | 0.00238665 | 4.15812 | 14.2264 | 1.00817 | 0.004 |
| 0 | 1.16039 | 0.00200815 | 5.31658 | 17.5168 | 1.00611 | 0.003 |
| 0 | 1.151 | 0.001 | 3.86678 | 16.9726 | 1.00637 | 0.002 |
| 0 | 1.15925 | 0.00125427 | 5.11038 | 15.7137 | 1.00813 | 0.00218951 |
| 0 | 1.24844 | 0.001 | 5.1545 | 16.7658 | 1.00716 | 0.00225179 |
| 0 | 1.21321 | 0.002 | 3.26254 | 16.6378 | 1.00599 | 0.003 |
| 0 | 1.19872 | 0.0012344 | 1.50366 | 15.5985 | 1.01481 | 0.00248416 |
| 0 | 1.09732 | 0.000158879 | 3.25245 | 14.6987 | 1.00806 | 0.002 |
| 0 | 1.22934 | 0.0018932 | 2.22055 | 19.4829 | 1.00699 | 0.002 |
| 0 | 1.1558 | 0.001 | 2.99822 | 16.1984 | 1.00522 | 0.00131766 |
| 0 | 1.22175 | 0.00152525 | 1.80691 | 17.9287 | 1.01173 | 0.00320528 |
| 0 | 1.16903 | $1.47724\times10^{-15}$ | 2.34845 | 13.8869 | 1.0036 | 0.000991966 |
| 0 | 1.18429 | 0.00127124 | 1.94814 | 16.6207 | 1.01438 | 0.00225965 |
| 0 | 1.20893 | 0.000630379 | 1.93721 | 20.6775 | 1.01432 | 0.002 |
| 0 | 1.22857 | 0.000822492 | 1.91265 | 20.3585 | 1.01516 | 0.002 |
| 0 | 1.20294 | 0.000204238 | 1.77705 | 22.3264 | 1.01416 | 0.00161539 |
| 0 | 1.19963 | 0.000679314 | 1.95641 | 21.6387 | 1.02113 | 0.00179094 |
| 0 | 1.17967 | 0.000284813 | 1.93489 | 22.8674 | 1.02094 | 0.00163355 |
| 0 | 1.20179 | $2.33315\times10^{-14}$ | 1.96138 | 24.8313 | 1.01517 | 0.001 |
| 0 | 1.1548 | $8.86247\times10^{-16}$ | 1.87107 | 26.0652 | 1.02879 | 0.00158926 |
| 0 | 1.18719 | 0.000221905 | 1.86713 | 29.5489 | 1.03968 | 0.001 |
| 0 | 1.18879 | $-3.05833\times10^{-17}$ | 1.92742 | 28.2752 | 1.02773 | 0.00173965 |
| 0 | 1.23074 | $-1.58576\times10^{-16}$ | 1.92259 | 31.7819 | 1.04989 | 0.00106102 |
| 0 | 1.20841 | −0.000527158 | 1.93457 | 31.6283 | 1.03579 | 0.000818153 |
| 0 | 1.19176 | −0.000498251 | 1.95151 | 32.6049 | 1.0571 | 0.00114743 |
| 0 | 1.2402 | −0.000554612 | 1.9563 | 36.9081 | 1.09673 | 0.00140388 |
| 0 | 1.21283 | −0.000614706 | 1.95985 | 38.462 | 1.09202 | 0.001 |
| 0 | 1.30762 | −0.000468848 | 1.95316 | 40.4015 | 1.10998 | 0.001 |
| 0 | 1.27636 | −0.000869964 | 1.948 | 41.0047 | 1.12374 | 0.000892881 |
| 0 | 1.32014 | −0.001 | 1.9802 | 41.8956 | 1.15977 | 0.000742876 |
| 0 | 1.36558 | −0.00115757 | 1.9989 | 43.8367 | 1.24379 | 0.00086216 |
| 0 | 1.3749 | −0.00149242 | 2.00064 | 43.2933 | 1.26147 | 0.000604476 |
| 0 | 0.0505319 | 0.000119969 | 1.40516 | 114.416 | 1.00993 | 0.000109993 |
| 0 | 0.0550495 | 0.000123904 | 1.377 | 126.352 | 1.01361 | 0.000123598 |
| 0 | 0.0523842 | 0.000108296 | 1.35857 | 139.553 | 1.01749 | 0.0001 |
| 0 | 0.0537379 | 0.000115938 | 1.32193 | 155.073 | 1.02756 | 0.000109556 |
| 0 | 0.0550327 | 0.000119849 | 1.29432 | 173.444 | 1.03617 | 0.00010264 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0.0534667 | 0.000117524 | 1.28296 | 189.24 | 1.05253 | 0.0000885064 |
| 0 | 0.0539768 | 0.000104633 | 1.27194 | 207.602 | 1.04518 | 0.0000750396 |
| 0 | 0.0553817 | 0.000106167 | 1.25313 | 231.845 | 1.07123 | 0.000075783 |
| 0 | 0.0546521 | 0.0000835583 | 1.20083 | 337.424 | 1.01695 | 0.000106083 |
| 0 | 0.056567 | 0.0000802136 | 1.19594 | 361.015 | 1.02969 | 0.00011042 |
| 0 | 0.0569618 | 0.0000574245 | 1.1937 | 380.491 | 1.04479 | 0.000073055 |
| 0 | 0.0588657 | 0.0000525738 | 1.19051 | 408.357 | 1.07747 | 0.0000784673 |
| 0 | 0.0614357 | 0.0000404143 | 1.1883 | 433.35 | 1.1211 | 0.0000722134 |
| 0 | 0.0667686 | 0.0000339743 | 1.18622 | 460.917 | 1.18839 | 0.0000700665 |
| 0 | 0.0683615 | 0.0000192604 | 1.18278 | 486.979 | 1.30347 | 0.0000677266 |
| 0 | 0.0753567 | 0.0000168208 | 1.18076 | 516.5 | 1.4479 | 0.0000732852 |
| 0 | 0.0771389 | $2.94224 \times 10^{-6}$ | 1.17909 | 549.777 | 1.53042 | 0.0000636122 |
| 0 | 0.0885712 | $-4.71044 \times 10^{-6}$ | 1.17888 | 581.607 | 1.74052 | 0.0000597728 |
| 0 | 0.0987795 | -0.0000131566 | 1.17591 | 616.985 | 1.95422 | 0.0000557439 |
| 0 | 0.105475 | -0.0000184069 | 1.17568 | 649.086 | 2.10053 | 0.0000533272 |
| 0 | 0.120431 | -0.0000262465 | 1.17588 | 685.985 | 2.5479 | 0.000051489 |
| 0 | 0.136935 | -0.0000333798 | 1.17246 | 729.391 | 2.68156 | 0.0000472324 |
| 0 | 0.151179 | -0.0000403097 | 1.17222 | 771.197 | 3.12409 | 0.0000442937 |
| 0 | 0.16647 | -0.0000429777 | 1.17297 | 814.024 | 3.63039 | 0.0000461913 |
| 0 | 0.188714 | -0.0000451937 | 1.17072 | 859.189 | 3.80302 | 0.0000402007 |
| 0 | 0.206084 | -0.0000472308 | 1.16998 | 912.545 | 4.17977 | 0.0000388326 |
| 0 | 0.226468 | -0.0000544669 | 1.16868 | 961.088 | 4.79251 | 0.0000369407 |
| 0 | 0.247063 | -0.0000547145 | 1.16748 | 1017.55 | 5.25124 | 0.0000344448 |
| 0 | 0.268542 | -0.0000598849 | 1.16775 | 1073.18 | 5.67869 | 0.0000299274 |
| 0 | 0.290006 | -0.000057391 | 1.16659 | 1140.33 | 6.10567 | 0.0000303791 |
| 0 | 0.309255 | -0.0000579965 | 1.16551 | 1214.44 | 7.19238 | 0.0000246838 |
| 0 | 0.334899 | -0.0000578015 | 1.1648 | 1295.64 | 7.53645 | 0.0000285633 |
| 0 | 0.352511 | -0.0000587537 | 1.16479 | 1358.35 | 7.82325 | 0.0000263575 |
| 0 | 0.373169 | -0.0000540257 | 1.16471 | 1459.44 | 8.25637 | 0.0000276264 |
| 0 | 0.404971 | -0.0000545361 | 1.16314 | 1549.68 | 8.97384 | 0.0000242723 |
| 0 | 0.416768 | -0.0000514019 | 1.16304 | 1641.91 | 9.35379 | 0.0000237476 |
| 0 | 0.432979 | -0.0000454475 | 1.16204 | 1786.82 | 9.9047 | 0.0000252407 |
| 0 | 0.455723 | -0.0000495256 | 1.16273 | 1872.29 | 10.24 | 0.0000239261 |
| 0 | 0.466721 | -0.0000382989 | 1.16098 | 2045.85 | 10.5051 | 0.0000226805 |
| 0 | 0.491225 | -0.0000392428 | 1.15988 | 2159.17 | 10.9161 | 0.0000250499 |
| 0 | 0.508788 | -0.0000307554 | 1.15928 | 2370.67 | 11.5656 | 0.0000247305 |
| 0 | 0.531247 | -0.0000336465 | 1.1595 | 2498.74 | 11.3101 | 0.0000236849 |
| 0 | 0.6308 | -0.0000140615 | 1.1541 | 4091.63 | 14.406 | 0.0000263915 |
| 0 | 0.624738 | -0.0000113738 | 1.15487 | 4371.36 | 14.0175 | 0.000023587 |
| 0 | 0.64856 | $-9.16259 \times 10^{-6}$ | 1.15437 | 4631.46 | 14.4314 | 0.0000252814 |
| 0 | 0.660737 | $-9.68559 \times 10^{-6}$ | 1.15372 | 4869.1 | 14.3922 | 0.00002587 |
| 0 | 0.65712 | $-7.69188 \times 10^{-6}$ | 1.15443 | 5194.05 | 15.2574 | 0.0000271423 |
| 0 | 0.671003 | $-7.45848 \times 10^{-6}$ | 1.15348 | 5518.78 | 15.5973 | 0.0000278597 |
| 0 | 0.686258 | $-6.47917 \times 10^{-6}$ | 1.15432 | 5706.81 | 15.5703 | 0.0000261213 |
| 0 | 0.682794 | $-5.04787 \times 10^{-6}$ | 1.15385 | 6196. | 15.369 | 0.0000303693 |
| 0 | 0.681189 | $-4.69915 \times 10^{-6}$ | 1.15338 | 6406.83 | 15.6971 | 0.0000292646 |
| 0 | 0.708051 | $-5.45789 \times 10^{-6}$ | 1.15317 | 6728.45 | 15.7742 | 0.0000292623 |
| 0 | 0.713582 | $-3.44051 \times 10^{-6}$ | 1.15432 | 7209.78 | 15.4451 | 0.0000317963 |
| 0 | 0.708826 | $-2.85403 \times 10^{-6}$ | 1.15355 | 7629.56 | 16.2603 | 0.0000377846 |
| 0 | 0.709887 | $-2.15802 \times 10^{-6}$ | 1.15414 | 7914.12 | 16.1974 | 0.0000357207 |
| 0 | 0.715997 | $-2.57549 \times 10^{-6}$ | 1.15449 | 8200.73 | 16.4411 | 0.0000371401 |
| 0 | 0.73171 | $-2.34965 \times 10^{-6}$ | 1.15402 | 8807.93 | 16.2855 | 0.0000430158 |
| 0 | 0.747777 | $-1.12116 \times 10^{-6}$ | 1.15433 | 9132.69 | 16.7893 | 0.0000454577 |
| 0 | 0.746609 | $-2.3962 \times 10^{-6}$ | 1.15446 | 9474.08 | 17.2313 | 0.000050669 |
| 0 | 0.754923 | $-1.03742 \times 10^{-6}$ | 1.15433 | 10 083.6 | 17.0396 | 0.0000636627 |
| 0 | 0.764253 | $-4.01275 \times 10^{-18}$ | 1.15424 | 10 737.2 | 17.0203 | 0.0000908943 |
| 0 | 0.76428 | $-9.63519 \times 10^{-7}$ | 1.1551 | 10 802.8 | 17.5446 | 0.000091126 |

## Nv

In[476]:=
```
Transpose[simParamNv] // TableForm
```

Out[476]//TableForm=

| | | | | | | |
|---|---|---|---|---|---|---|
| 0.00105711 | 0.00221298 | 0.0107502 | 0.0495193 | 0.093503 | 0.658054 | 1.394 |
| 0.00113152 | 0.00236908 | 0.011503 | 0.0530622 | 0.100251 | 0.699467 | 1.480 |
| 0.00121222 | 0.0025384 | 0.0123195 | 0.0569177 | 0.107597 | 0.743495 | 1.572 |
| 0.00129979 | 0.00272213 | 0.0132057 | 0.0611202 | 0.115607 | 0.790246 | 1.669 |
| 0.00139483 | 0.0029216 | 0.0141673 | 0.0656872 | 0.124311 | 0.839604 | 1.771 |
| 0.00149805 | 0.00313822 | 0.015212 | 0.0706678 | 0.133802 | 0.891716 | 1.880 |
| 0.00161016 | 0.00337357 | 0.0163471 | 0.0760958 | 0.144139 | 0.946495 | 1.994 |
| 0.001732 | 0.00362936 | 0.0175809 | 0.0820123 | 0.155395 | 1.00386 | 2.113 |
| 0.00186445 | 0.00390743 | 0.018923 | 0.0884733 | 0.167666 | 1.06378 | 2.238 |
| 0.00200848 | 0.0042099 | 0.0203821 | 0.0955071 | 0.180999 | 1.12593 | 2.369 |
| 0.00216516 | 0.00453898 | 0.0219694 | 0.103176 | 0.195494 | 1.19015 | 2.505 |
| 0.00233566 | 0.00489714 | 0.0236971 | 0.111538 | 0.211242 | 1.25621 | 2.647 |
| 0.00252124 | 0.00528706 | 0.0255779 | 0.120652 | 0.228337 | 1.32384 | 2.794 |
| 0.00272331 | 0.00571168 | 0.0276259 | 0.130586 | 0.246874 | 1.3927 | 2.946 |
| 0.00294339 | 0.00617423 | 0.0298565 | 0.14141 | 0.266946 | 1.46247 | 3.103 |
| 0.00318317 | 0.00667822 | 0.0322874 | 0.1532 | 0.288638 | 1.53274 | 3.266 |
| 0.00344446 | 0.00722754 | 0.034934 | 0.166018 | 0.312037 | 1.60327 | 3.433 |
| 0.00372927 | 0.0078264 | 0.0378201 | 0.179979 | 0.337223 | 1.67362 | 3.605 |
| 0.00403979 | 0.00847943 | 0.0409644 | 0.195128 | 0.364249 | 1.7436 | 3.781 |
| 0.0043784 | 0.00919166 | 0.0443898 | 0.211582 | 0.393186 | 1.81298 | 3.961 |
| 0.00474774 | 0.00996864 | 0.0481247 | 0.229399 | 0.424016 | 1.88152 | 4.145 |
| 0.00515091 | 0.0108168 | 0.0521991 | 0.248644 | 0.456735 | 1.94917 | 4.333 |
| 0.00559059 | 0.011742 | 0.0566374 | 0.269452 | 0.49135 | 2.01584 | 4.524 |
| 0.00607043 | 0.0127518 | 0.0614748 | 0.291871 | 0.527756 | 2.08149 | 4.718 |
| 0.00659418 | 0.0138542 | 0.0667468 | 0.315966 | 0.565832 | 2.14614 | 4.914 |
| 0.00716491 | 0.0150566 | 0.0724901 | 0.341798 | 0.605409 | 2.20978 | 5.112 |
| 0.0077891 | 0.0163707 | 0.0787477 | 0.369388 | 0.646238 | 2.27239 | 5.313 |
| 0.0084707 | 0.0178057 | 0.0855628 | 0.398756 | 0.688041 | 2.33398 | 5.514 |
| 0.00921586 | 0.0193736 | 0.0929835 | 0.429898 | 0.730469 | 2.39451 | 5.717 |
| 0.0100288 | 0.0210851 | 0.101057 | 0.462753 | 0.773114 | 2.45395 | 5.920 |
| 0.0109168 | 0.0229544 | 0.109839 | 0.497247 | 0.815527 | 2.51224 | 6.124 |
| 0.0118866 | 0.0249959 | 0.119386 | 0.533254 | 0.857224 | 2.56934 | 6.327 |
| 0.0129461 | 0.0272256 | 0.129756 | 0.5706 | 0.897708 | 2.6252 | 6.529 |
| 0.0141039 | 0.0296617 | 0.141002 | 0.609092 | 0.936492 | 2.67979 | 6.731 |
| 0.0153681 | 0.032321 | 0.153208 | 0.648393 | 0.973092 | 2.73307 | 6.931 |
| 0.0167492 | 0.0352247 | 0.166441 | 0.688193 | 1.00711 | 2.785 | 7.130 |
| 0.0182472 | 0.0383836 | 0.180737 | 0.728116 | 1.03822 | 2.83558 | 7.326 |
| 0.0198948 | 0.0418443 | 0.196196 | 0.767748 | 1.06621 | 2.88478 | 7.521 |
| 0.0216944 | 0.0456214 | 0.212874 | 0.806623 | 1.09099 | 2.9326 | 7.713 |
| 0.0236597 | 0.0497429 | 0.230838 | 0.844272 | 1.11259 | 2.97902 | 7.902 |
| 0.0320447 | 0.0659015 | 0.308801 | 0.966234 | 1.16406 | 3.11308 | 8.458 |
| 0.0344697 | 0.070854 | 0.328911 | 0.98669 | 1.17254 | 3.14487 | 8.595 |
| 0.0370785 | 0.076174 | 0.350035 | 1.0053 | 1.18009 | 3.17598 | 8.731 |
| 0.0398848 | 0.0818868 | 0.372174 | 1.02202 | 1.18685 | 3.20638 | 8.864 |
| 0.042903 | 0.0880187 | 0.395318 | 1.03686 | 1.19298 | 3.23608 | 8.996 |
| 0.0461481 | 0.0945978 | 0.419444 | 1.04987 | 1.19859 | 3.26509 | 9.126 |
| 0.0496447 | 0.101657 | 0.444543 | 1.06113 | 1.20378 | 3.29339 | 9.254 |
| 0.0533951 | 0.109222 | 0.470521 | 1.07079 | 1.20864 | 3.321 | 9.380 |
| 0.0574238 | 0.117323 | 0.497335 | 1.07897 | 1.21321 | 3.34791 | 9.504 |
| 0.0617497 | 0.125995 | 0.524884 | 1.08587 | 1.21753 | 3.37412 | 9.626 |
| 0.0663975 | 0.135273 | 0.553115 | 1.09167 | 1.22165 | 3.39967 | 9.745 |
| 0.0713905 | 0.145194 | 0.581888 | 1.09653 | 1.22558 | 3.42449 | 9.863 |
| 0.0767222 | 0.155767 | 0.611056 | 1.10065 | 1.22932 | 3.44866 | 9.978 |
| 0.082443 | 0.167051 | 0.640479 | 1.10416 | 1.23291 | 3.47217 | 10.09 |
| 0.0886068 | 0.179109 | 0.669993 | 1.10721 | 1.23632 | 3.49489 | 10.20 |
| 0.0951852 | 0.191925 | 0.699388 | 1.1099 | 1.2396 | 3.51717 | 10.30 |
| 0.102233 | 0.205559 | 0.728472 | 1.11232 | 1.24273 | 3.53863 | 10.41 |
| 0.109772 | 0.220037 | 0.757031 | 1.11452 | 1.24571 | 3.55947 | 10.51 |
| 0.11783 | 0.235392 | 0.784845 | 1.11657 | 1.24856 | 3.57968 | 10.61 |
| 0.126442 | 0.251654 | 0.811695 | 1.11847 | 1.25129 | 3.59924 | 10.71 |
| 0.135637 | 0.268848 | 0.837366 | 1.12027 | 1.2539 | 3.6183 | 10.81 |
| 0.145443 | 0.286988 | 0.861659 | 1.12196 | 1.25638 | 3.63655 | 10.90 |

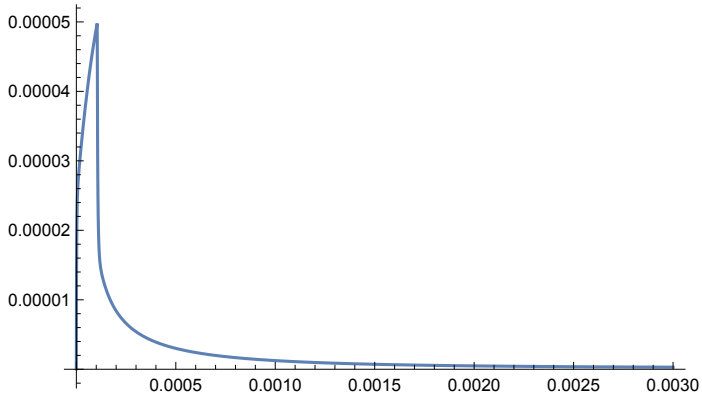
| | | | | | | |
|---|---|---|---|---|---|---|
| 0.155891 | 0.306099 | 0.884379 | 1.12357 | 1.25875 | 3.65425 | 10.99 |
| 0.167017 | 0.326188 | 0.905382 | 1.12509 | 1.26101 | 3.67137 | 11.08 |
| 0.178847 | 0.34725 | 0.924541 | 1.12653 | 1.26317 | 3.68792 | 11.16 |
| 0.191404 | 0.369275 | 0.94177 | 1.12789 | 1.26523 | 3.70388 | 11.25 |
| 0.204742 | 0.392266 | 0.957034 | 1.12919 | 1.2672 | 3.71929 | 11.33 |
| 0.218856 | 0.416162 | 0.970336 | 1.13041 | 1.26908 | 3.73415 | 11.41 |
| 0.233804 | 0.440962 | 0.981726 | 1.13158 | 1.27087 | 3.74847 | 11.48 |
| 0.249578 | 0.466568 | 0.991304 | 1.13268 | 1.27258 | 3.76226 | 11.56 |
| 0.266244 | 0.492969 | 0.999203 | 1.13373 | 1.27421 | 3.77553 | 11.63 |
| 0.283745 | 0.520007 | 1.00559 | 1.13472 | 1.27576 | 3.78831 | 11.70 |
| 0.302125 | 0.547603 | 1.01064 | 1.13566 | 1.27724 | 3.8006 | 11.76 |
| 0.32144 | 0.575694 | 1.01457 | 1.13656 | 1.27865 | 3.81241 | 11.83 |
| 0.478817 | 0.766558 | 1.02386 | 1.13949 | 1.28302 | 3.8455 | 12.00 |
| 0.498598 | 0.786735 | 1.02434 | 1.1401 | 1.28404 | 3.85478 | 12.06 |
| 0.51871 | 0.806265 | 1.02474 | 1.14068 | 1.28502 | 3.86369 | 12.10 |
| 0.539125 | 0.82507 | 1.02508 | 1.14124 | 1.28595 | 3.87223 | 12.15 |
| 0.559754 | 0.843048 | 1.02539 | 1.14177 | 1.28685 | 3.88043 | 12.20 |
| 0.580557 | 0.860137 | 1.02566 | 1.14227 | 1.2877 | 3.88828 | 12.24 |
| 0.601493 | 0.876275 | 1.02591 | 1.14276 | 1.28851 | 3.8958 | 12.28 |
| 0.622499 | 0.891409 | 1.02614 | 1.14321 | 1.28929 | 3.90302 | 12.33 |
| 0.643491 | 0.905491 | 1.02636 | 1.14365 | 1.29004 | 3.90993 | 12.36 |
| 0.66439 | 0.918488 | 1.02657 | 1.14407 | 1.29075 | 3.91655 | 12.40 |
| 0.685142 | 0.930392 | 1.02676 | 1.14447 | 1.29143 | 3.9229 | 12.44 |
| 0.70567 | 0.9412 | 1.02694 | 1.14485 | 1.29208 | 3.92898 | 12.47 |
| 0.725902 | 0.950926 | 1.02712 | 1.14521 | 1.2927 | 3.9348 | 12.51 |
| 0.745736 | 0.959585 | 1.02728 | 1.14556 | 1.29329 | 3.94038 | 12.54 |
| 0.765118 | 0.967227 | 1.02744 | 1.14589 | 1.29386 | 3.94572 | 12.57 |
| 0.783964 | 0.973896 | 1.02759 | 1.14621 | 1.2944 | 3.95083 | 12.60 |
| 0.802199 | 0.979655 | 1.02773 | 1.14651 | 1.29492 | 3.95572 | 12.63 |
| 0.81976 | 0.984571 | 1.02786 | 1.1468 | 1.29541 | 3.96041 | 12.65 |
| 0.836581 | 0.988717 | 1.02799 | 1.14707 | 1.29588 | 3.9649 | 12.68 |
| 0.852609 | 0.992174 | 1.02811 | 1.14733 | 1.29634 | 3.9692 | 12.70 |

# EPSC with different caRest

## Interpolate

In[477]:=
```
locaCa = Transpose[{dataLocalCaTime, dataLocalCa}];
locaCaWithoutdublictes = Mean /@ GatherBy[locaCa, First];
interpolFunc = Interpolation[locaCaWithoutdublictes, InterpolationOrder → 1];
caFunc[t_] := interpolFunc[t];
Plot[caFunc[t], {t, 0.00, 0.003}, PlotRange → All]
```

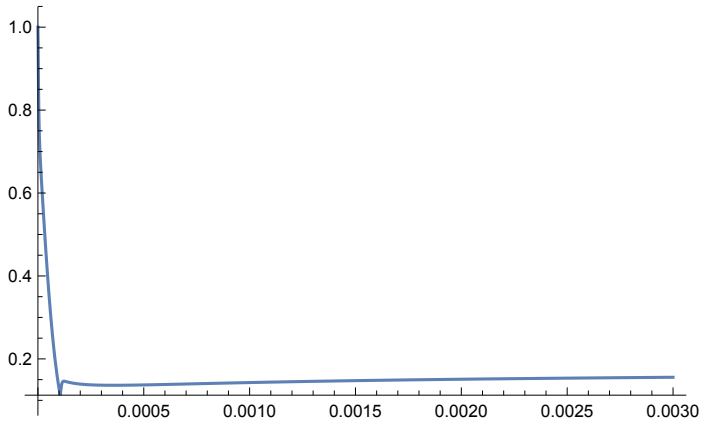
Out[481]=



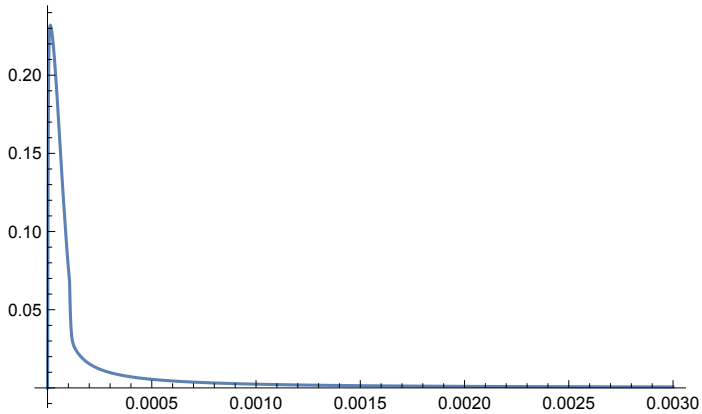

# NDSolve

In[482]:=
```
timeStartForPLot = 0.0;
timeEndForPLot = 0.003;
myNDSolveResults = NDSolve[eq, {ss1, ss2, ss3, ss4}, {t, 0, 0.003}];
Plot[(ss1[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss2[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss3[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss4[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
```

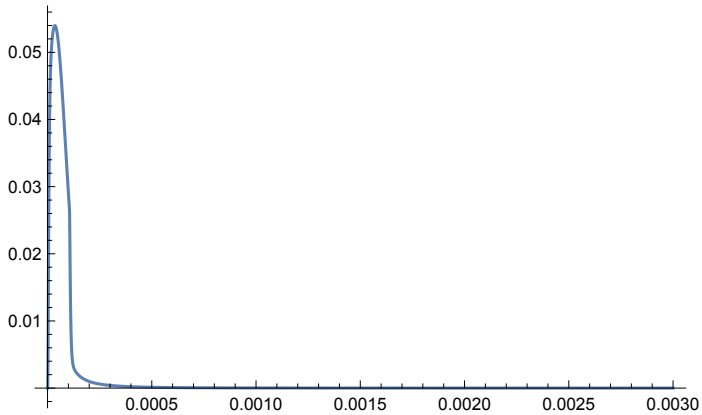
Out[485]=



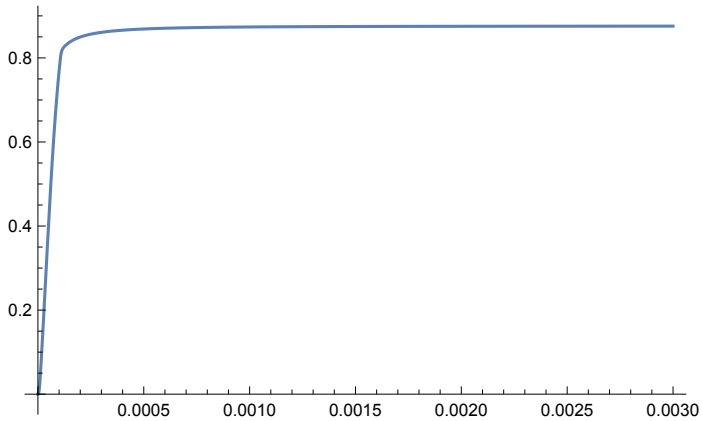
Out[486]=




Out[487]=




Out[488]=




# different caRest

In[489]:=
```
caRestLow = 30*^-9;
caRestHigh = 180*^-9;
```

# Low Ca

## Initial occupancy

In[491]:=
```
(*calualte initial equilibrium occupancy*)
caFunc[t_] := caRestLow;
kprimScheme
kunprimScheme
ss0Initial = kprimScheme / kunprimScheme
```

Out[492]= 1.04335

Out[493]= 3.65793

Out[494]= 0.28523

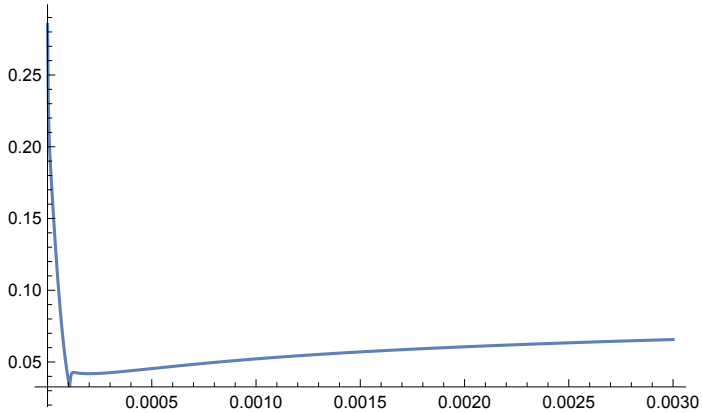
## Diff eq.

In[495]:=
```
Clear[caFunc, eq];(*Clear is needed if the cell is exectued for a 2nd time
 when caFunc is already set to a value or an Interpolationfunction*)
caFunc[t_] := interpolFunc[t];
ss[t_] = {ss1[t], ss2[t], ss3[t], ss4[t]};
eq = {ss'[t] == (mat /. repl).ss[t],
   ss[0] == {ss0Initial, 0, 0, 0}};
```

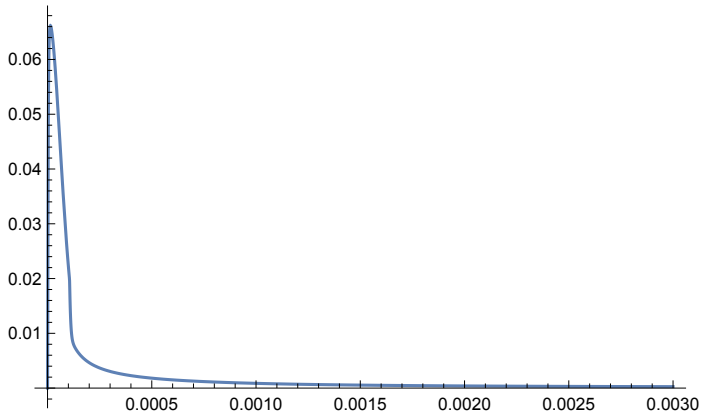
## NDSolve

In[499]:=
```
myNDSolveResults = NDSolve[eq, {ss1, ss2, ss3, ss4}, {t, 0, 0.003}];
Plot[(ss1[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss2[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss3[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss4[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
```

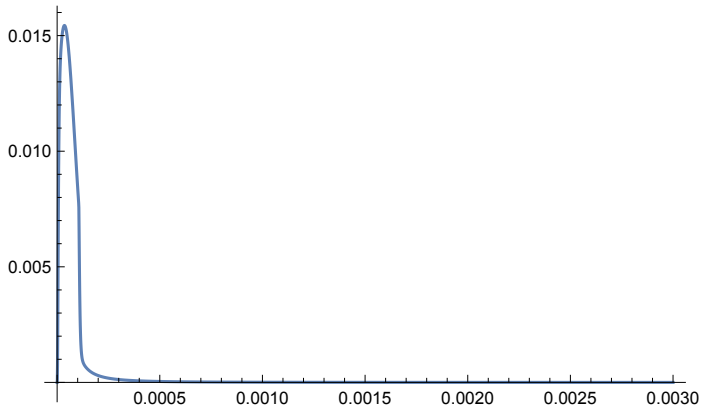
Out[500]=



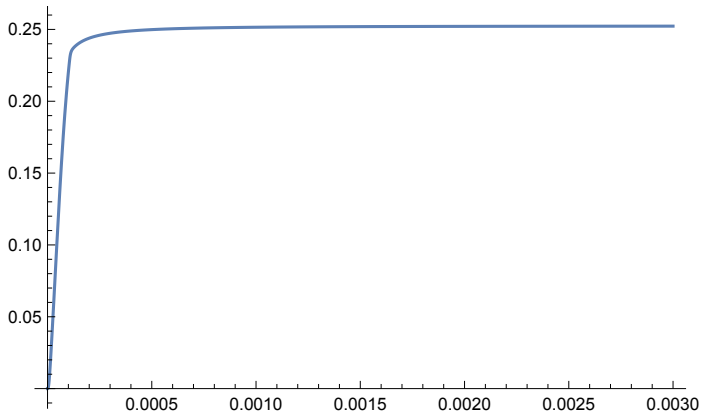

Out[501]=




Out[502]=



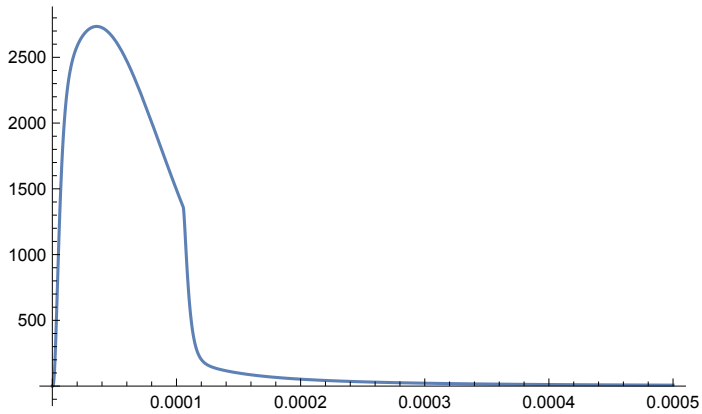

Out[503]=



## Plot EPSC

In[504]:=
```
epscLowCa = D[(ss4[t] /. myNDSolveResults), t];
Plot[(ss4[t] /. myNDSolveResults), {t, 0, 2*^-3}, PlotRange → All];
Plot[epscLowCa, {t, 0, 0.5*^-3}, PlotRange → All]
```

Out[506]=




# High Ca

## Initial occupancy

In[507]:=
```
(*calualte initial equilibrium occupancy*)
caFunc[t_] := caRestHigh;
kprimScheme
kunprimScheme
ss0Initial = kprimScheme / kunprimScheme
```

Out[508]= 3.07706

Out[509]= 3.65793

Out[510]= 0.841205

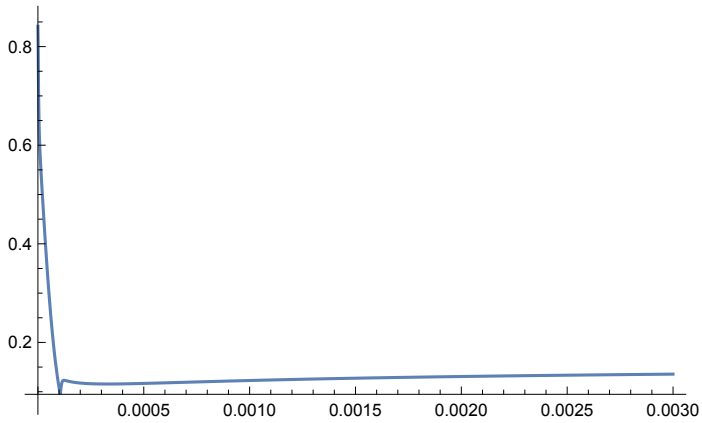
## Diff eq.

In[511]:=
```
Clear[caFunc, eq];(*Clear is needed if the cell is exectued for a 2nd time
 when caFunc is already set to a value or an Interpolationfunction*)
caFunc[t_] := interpolFunc[t];
ss[t_] = {ss1[t], ss2[t], ss3[t], ss4[t]};
eq = {ss'[t] == (mat /. repl).ss[t],
   ss[0] == {ss0Initial, 0, 0, 0}};
```

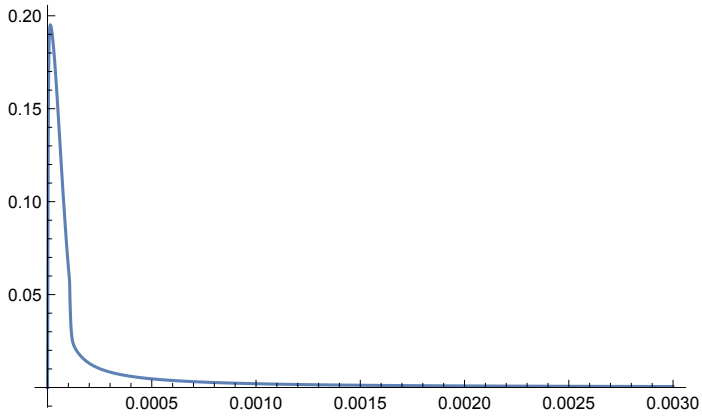
# NDSolve

In[515]:=
```
myNDSolveResults = NDSolve[eq, {ss1, ss2, ss3, ss4}, {t, 0, 0.003}];
Plot[(ss1[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss2[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss3[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
Plot[(ss4[t] /. myNDSolveResults),
 {t, timeStartForPLot, timeEndForPLot}, PlotRange → All]
```

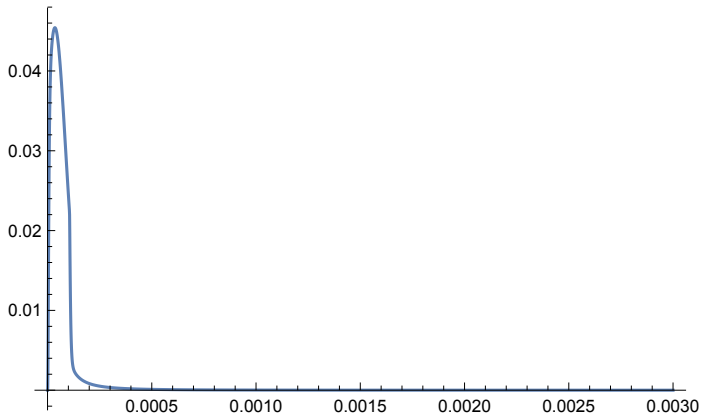
Out[516]=



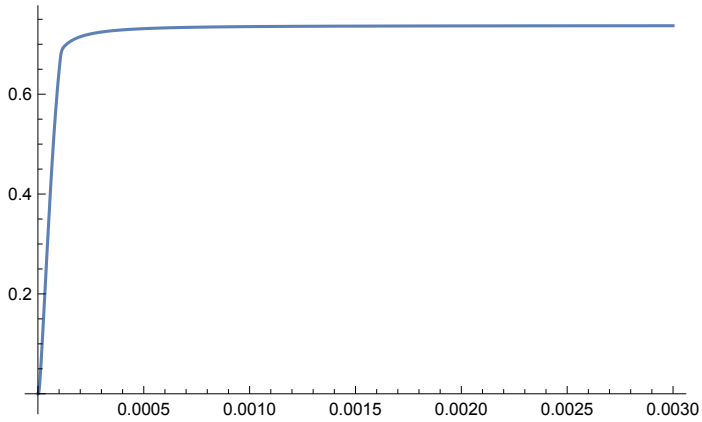

Out[517]=




Out[518]=



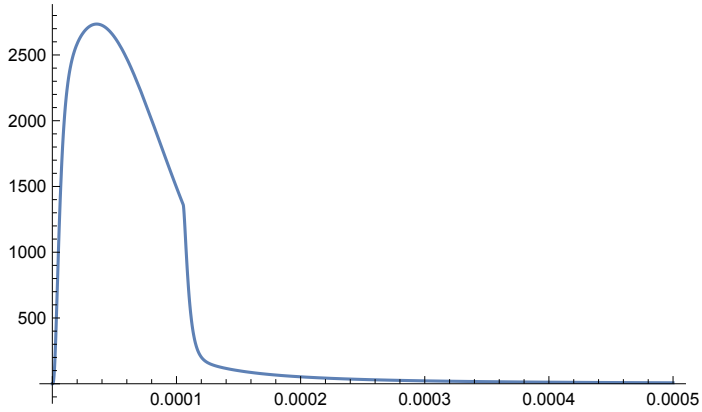
Out[519]=




# Plot EPSC

In[520]:=
```
epscHighCa = D[(ss4[t] /. myNDSolveResults), t];
Plot[(ss4[t] /. myNDSolveResults), {t, 0, 2*^-3}, PlotRange → All];
Plot[epscLowCa, {t, 0, 0.5*^-3}, PlotRange → All]
```

Out[522]=

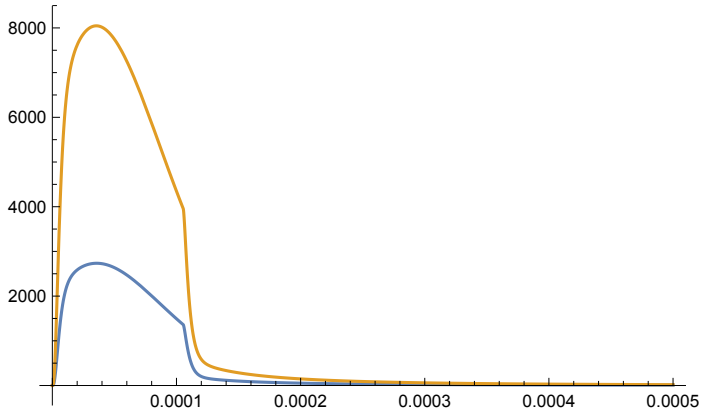


# Compare

## Plot both release rates

In[523]:=
```
Plot[{epscLowCa, epscHighCa}, {t, 0, 0.5*^-3}, PlotRange → All]
```

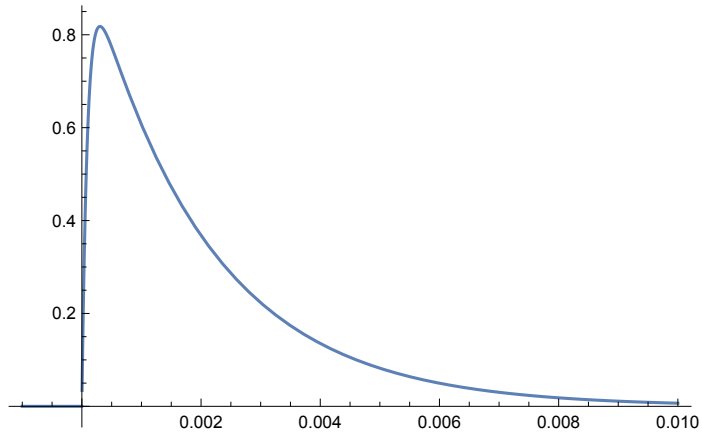
Out[523]=



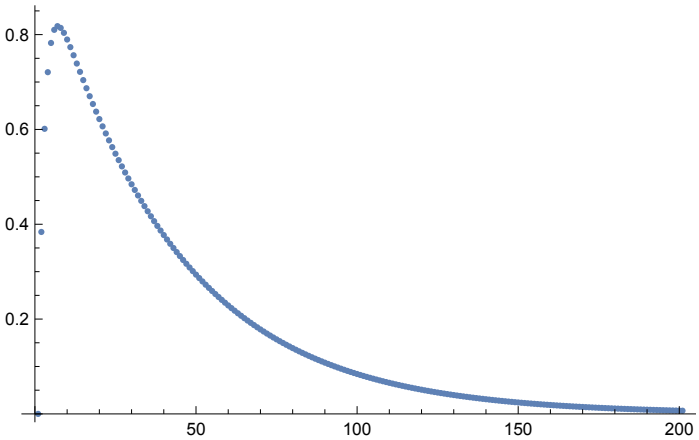

## Convolution RelRate => EPSC

In[524]:=
```
miniKernel[t_] := If[t ≤ 0, 0, (1 - Exp[-t / 0.0001]) * Exp[-t / 0.002]];
Plot[miniKernel[t], {t, -.001, .01}]
dtForConvolve = 0.00005;
tEndConv = 0.01;
miniKernelList = Table[miniKernel[t], {t, 0.0, tEndConv, dtForConvolve}];
epscHighCaList = {Table[0, {t, 0, tEndConv, dtForConvolve}],
   Table[epscHighCa, {t, 0.0, 0.0025, dtForConvolve}],
   Table[0, {t, 0, tEndConv, dtForConvolve}]} // Flatten;
epscLowCaList = {Table[0, {t, 0, tEndConv, dtForConvolve}],
   Table[epscLowCa, {t, 0.0, 0.0025, dtForConvolve}],
   Table[0, {t, 0, tEndConv, dtForConvolve}]} // Flatten;
ListPlot[miniKernelList]
ListPlot[epscLowCaList, PlotRange → All]
```

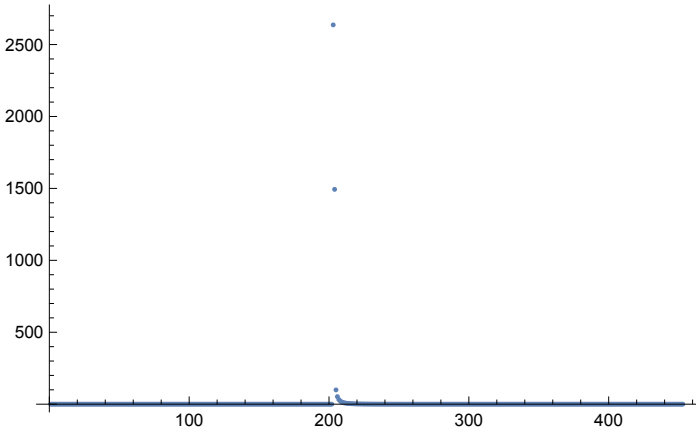
Out[525]=



Out[530]=

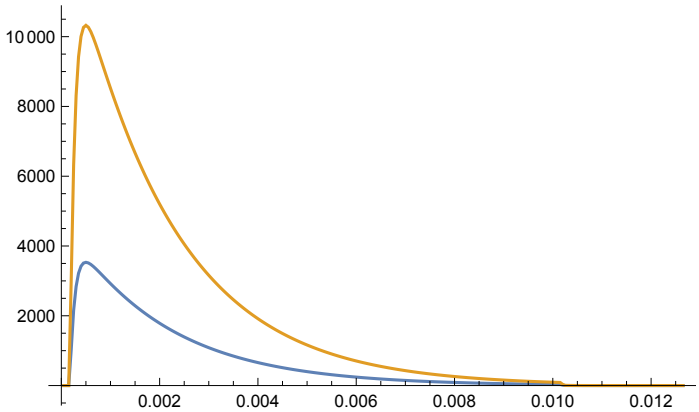



Out[531]=

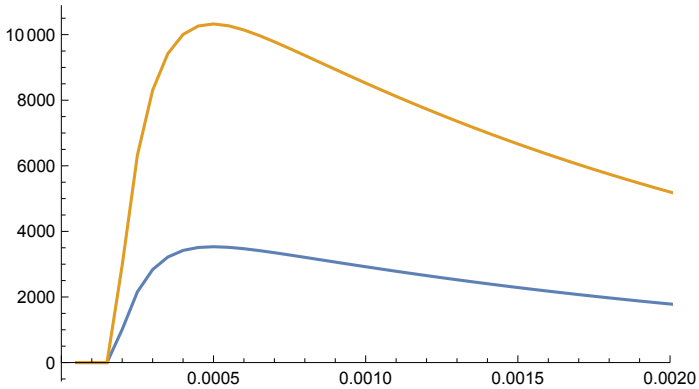



In[532]:=
```
epscLowCaCurrentList = ListConvolve[miniKernelList, epscLowCaList];
epscHighCaCurrentList = ListConvolve[miniKernelList, epscHighCaList];
timeConv = Table[t * dtForConvolve, {t, Length[epscLowCaCurrentList]}];
ListPlot[{Transpose[{timeConv, epscLowCaCurrentList}],
  Transpose[{timeConv, epscHighCaCurrentList}]}, Joined → True, PlotRange → All]
ListPlot[{Transpose[{timeConv, epscLowCaCurrentList}],
  Transpose[{timeConv, epscHighCaCurrentList}]},
 Joined → True, PlotRange → {{0, 0.002}, All}]
maxLow = Max[epscLowCaCurrentList]
maxHigh = Max[epscHighCaCurrentList]
Print["maxHigh/maxLow = ", maxHigh / maxLow];
ListPlot[{Transpose[{timeConv, (1 / maxLow) * epscLowCaCurrentList}],
  Transpose[{timeConv, (1 / maxHigh) * epscHighCaCurrentList}]},
 Joined → True, PlotRange → All]
ListPlot[{Transpose[{timeConv, (1 / maxLow) * epscLowCaCurrentList}],
  Transpose[{timeConv, (1 / maxHigh) * epscHighCaCurrentList}]},
 Joined → True, PlotRange → {{0, 0.002}, All}]
If[exportYes == 1,
  toExport = Transpose[{timeConv, epscLowCaCurrentList, epscHighCaCurrentList,
      (1 / maxLow) * epscLowCaCurrentList, (1 / maxHigh) * epscHighCaCurrentList}];
  Export["plot EPSC - low and high - abs and norm.txt", toExport, "Table"];
 ];
```

Out[535]=




Out[536]=

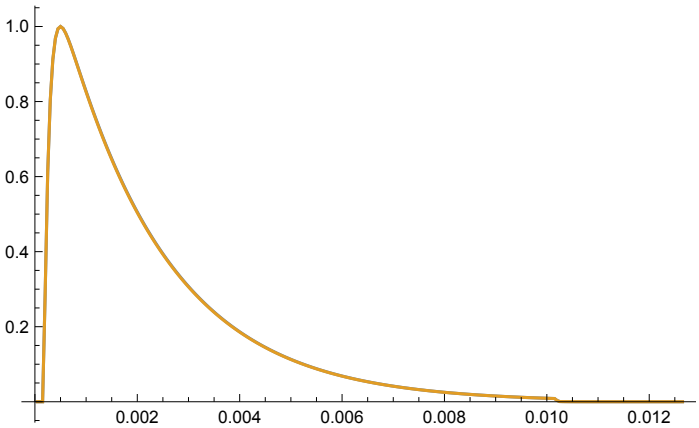



Out[537]= 3532.14

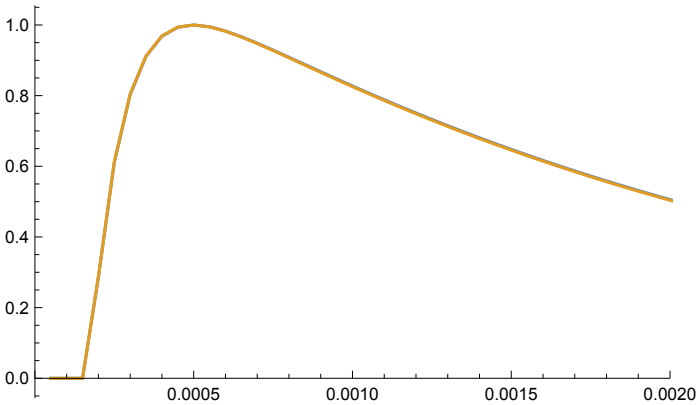
Out[538]= 10 325.2

maxHigh/maxLow = 2.92322

Out[540]=




Out[541]=



# Timing

In[543]:=
```
timeEnd = AbsoluteTime[];
(timeEnd - timeStart) / 60. (* time of calculation in min *)
```

Out[544]=
```
30.2032
```