In[1089]:=
```
(* Mathematica code for Model1 of Eshra et al. eLife 2021 *)
(* Stefan Hallermann and Hartmut Schmidt Aug 2021 *)
```

Import

general

In[1090]:=
```
(* all Ca in uM, all times in ms, all ampltiudes and Nv in vesicels *)
```

In[1091]:=
```
CmToVesConversionFactor = (1/90.12) * (1/70*^-18);(* explained in methods *)
```

In[1092]:=
```
rrp = 10;(* pool of release-ready vesicles per connection *)
```

In[1093]:=
```
dir = NotebookDirectory[];
SetDirectory[dir];
dataFolder = "../data to fit/";
```

tau1 Cm 5kHz

In[1096]:=
```
data = Import[dataFolder <> "all_t1_v02_C5.txt", "Table"];
```

In[1097]:=
```
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[1110]:=
```
data = Import[dataFolder <> "all_t1_v02_C10.txt", "Table"];
```

In[1111]:=
```
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[1124]:=
```
data = Import[dataFolder <> "all_t1_v02_D.txt", "Table"];
```

In[1125]:=
```
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[1138]:=
```
data = Import[dataFolder <> "all_t2_v02_C5.txt", "Table"];
```

In[1139]:=
```
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[1143]:=
```
data = Import[dataFolder <> "all_t2_v02_C10.txt", "Table"];
```

In[1144]:=
```
dataT2C10Ca = 0.001 * data[[All, 1]];
dataT2C10RelRate = 1000. * data[[All, 2]];
dataT2C10Amplitude2 = CmToVesConversionFactor data[[All, 3]];
dataT2C10Amplitude1 = CmToVesConversionFactor data[[All, 4]];
```

tau2 Deconv

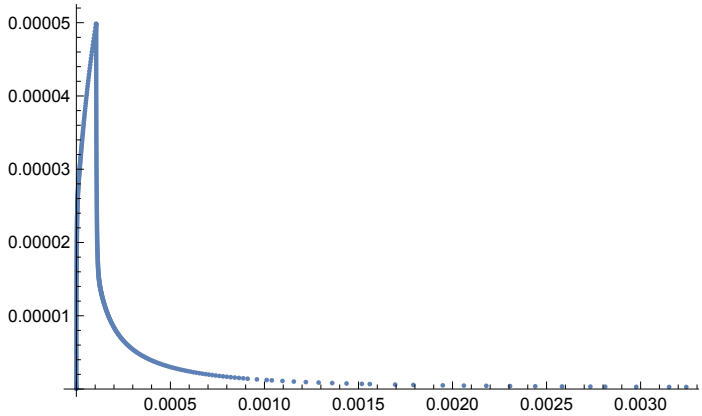
In[1147]:=
```
data = Import[dataFolder <> "all_t2_v02_D.txt", "Table"];
```

In[1148]:=
```
dataT2DCa = 0.001 * data[[All, 1]];
dataT2DRelRate = 1000. * data[[All, 2]];
dataT2DAmplitude2 = data[[All, 3]];
dataT2DAmplitude1 = data[[All, 4]];
```

local Ca

In[1152]:=
```
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[1155]=



General parameters and definitions

general stuff

In[1156]:=
```
(* 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[1163]:=
```
timeStart = AbsoluteTime[]
```

Out[1163]= $3.839403510405420 \times 10^{9}$

noiseRepeats

In[1164]:=
```
noiseRepeats = 50;
(* should be increased to 50 for a full dataset *)
myQuantile1 = 0.25;
myQuantile2 = 0.75;
```

export parameters

In[1167]:=
```
dtOfPlotsForExport = 20*^-5;
exportYes = 1;
```

sampling and myNoise

In[1169]:=
```
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[1184]:=
```
aNumberDMN05 = 2;
aNumberDMN2 = 2;
aNumberDMN10 = 2;

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

Exp fit function

In[1190]:=
```
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

Concentrations in mol/l;
DMn uncaging according to Faas et al., 2005, 2007
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[1196]:=
```
CaListReal = CaListDye = {};
```

0.5 mM DMN

general parameters

In[1197]:=
```
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[1214]:=
```
(*Dye*)
If[OGB1 == 1,
 kOnOG  = 4.3 * 10^8;
kOffOG = 103.;]

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

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[1244]:=
```
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[1261]:=
```
(*Dye*)
If[OGB1 == 1,
```

```
 kOnOG  = 4.3 * 10^8;
kOffOG = 103.;]

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

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[1291]:=
```
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[1308]:=
```
(*Dye*)
If[OGB1 == 1,
 kOnOG  = 4.3 * 10^8;
kOffOG = 103.;]

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

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] *
```

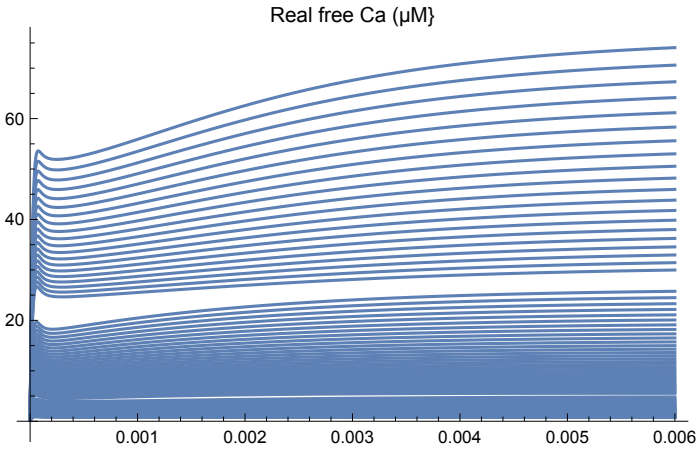
```
            UnitStep[tt - tflash] + 1 / taus * DMs[tt] * UnitStep[tt - tflash])
        + 1 / tauf * MgDMf[tt] * UnitStep[tt - tflash] +
        1 / taus * MgDMs[tt] * UnitStep[tt - tflash],

      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]];
```

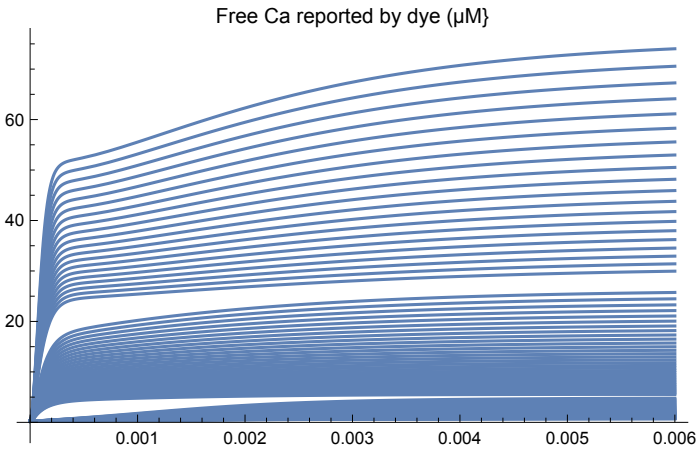
Plot and further processing

In[1338]:=
```
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 {{}}*)
```

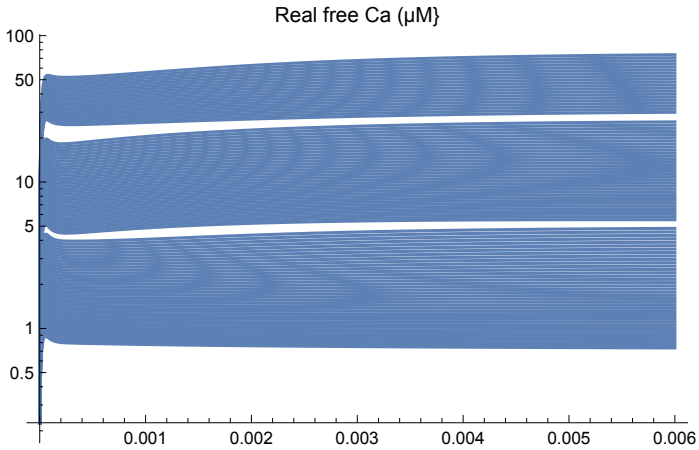
Out[1338]=



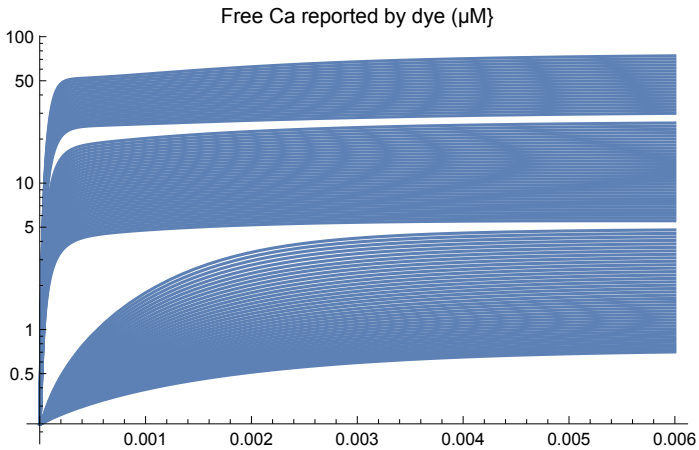
Out[1339]=



Out[1340]=



Out[1341]=



Out[1342]=

$$\{7.03073\times10^{-7}, 7.29825\times10^{-7}, 7.58204\times10^{-7}, 7.88054\times10^{-7},$$
$$8.20427\times10^{-7}, 8.54404\times10^{-7}, 8.90526\times10^{-7}, 9.28936\times10^{-7}, 9.68962\times10^{-7},$$
$$1.01226\times10^{-6}, 1.05883\times10^{-6}, 1.10833\times10^{-6}, 1.16077\times10^{-6}, 1.21664\times10^{-6},$$
$$1.27589\times10^{-6}, 1.33895\times10^{-6}, 1.40597\times10^{-6}, 1.47745\times10^{-6}, 1.55324\times10^{-6},$$
$$1.63202\times10^{-6}, 1.71772\times10^{-6}, 1.81058\times10^{-6}, 1.90732\times10^{-6}, 2.01009\times10^{-6},$$
$$2.11924\times10^{-6}, 2.23489\times10^{-6}, 2.35773\times10^{-6}, 2.48791\times10^{-6}, 2.62605\times10^{-6},$$
$$2.77177\times10^{-6}, 2.92648\times10^{-6}, 3.0905\times10^{-6}, 3.26357\times10^{-6}, 3.44741\times10^{-6},$$
$$3.64088\times10^{-6}, 3.84593\times10^{-6}, 4.06272\times10^{-6}, 4.29254\times10^{-6}, 4.53549\times10^{-6},$$
$$4.79194\times10^{-6}, 5.53376\times10^{-6}, 5.7741\times10^{-6}, 6.02652\times10^{-6}, 6.29189\times10^{-6},$$
$$6.57096\times10^{-6}, 6.86435\times10^{-6}, 7.17282\times10^{-6}, 7.4968\times10^{-6}, 7.83735\times10^{-6},$$
$$8.19526\times10^{-6}, 8.57176\times10^{-6}, 8.96782\times10^{-6}, 9.38444\times10^{-6}, 9.82288\times10^{-6},$$
$$0.0000102842, 0.00001077, 0.0000112815, 0.0000118202, 0.0000123876,$$
$$0.0000129855, 0.0000136155, 0.0000142795, 0.0000149795, 0.0000157174,$$
$$0.0000164957, 0.0000173163, 0.0000181821, 0.0000190955, 0.0000200596,$$
$$0.0000210761, 0.0000221498, 0.0000232819, 0.0000244782, 0.0000257412,$$
$$0.0000299583, 0.0000314124, 0.000032938, 0.0000345385, 0.0000362174,$$
$$0.0000379787, 0.0000398264, 0.0000417651, 0.0000437978, 0.0000459306,$$
$$0.0000481689, 0.0000505171, 0.0000529808, 0.0000555674, 0.000058281,$$
$$0.0000611317, 0.0000641214, 0.0000672653, 0.0000705652, 0.0000740312\}$$

In[1343]:=
```
runs = Length[CaListDyePeak];
```

Release scheme and parameters

Define release scheme

In[1344]:=
```
nStates = 4;
mat = Table[0, {nStates}, {nStates}];
```

forward rates

In[1346]:=
```
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[1355]:=
```
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[1361]:=
```
mat[[1, 1]] += -kunprim;
```

influx in matrix

In[1362]:=
```
mat[[1, 1]] += kprim / ss1[t];
```

Matrix

In[1363]:=
```
mat // TableForm
```

Out[1363]//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[1364]:=
```
q10 = 2.3;
tempFact = q10^((37 - 24) / 10);
```

In[1366]:=
```
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[1377]:=
```
tauOfDecayOfUncagedCa = 0.4;
```

Initial occupancy

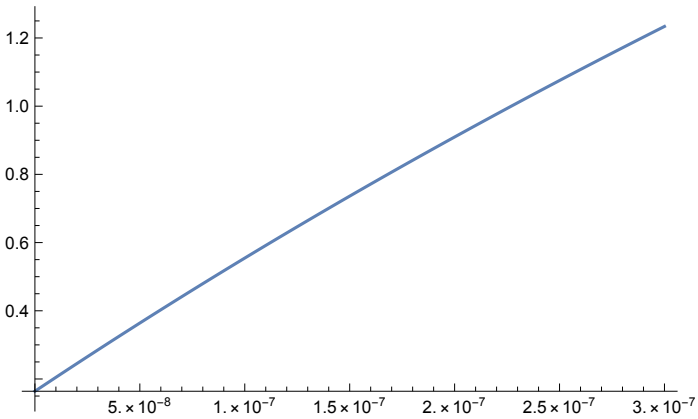
In[1378]:=
```
(*test initial equilibrium occupancy*)
caFunc[t_] := caTmp;
fillStateSSInitial = kprimScheme / kunprimScheme;
ss0Initial = fillStateSSInitial;
(ss0Initial /. caTmp → 180*^-9)
(ss0Initial /. caTmp → 30*^-9)
(ss0Initial /. caTmp → 180*^-9) / (ss0Initial /. caTmp → 30*^-9)
(*test initial *)
Plot[kprimScheme / kunprimScheme, {caTmp, 0, 300*^-9}]
```

Out[1381]= 0.841205

Out[1382]= 0.28523

Out[1383]= 2.94922

Out[1384]=



In[1385]:=
```
(*calualte initial equilibrium occupancy*)
caFunc[t_] := caRest;
kprimScheme
kunprimScheme
ss0Initial = kprimScheme / kunprimScheme
```

Out[1386]= 3.65793

Out[1387]= 3.65793

Out[1388]= 1.

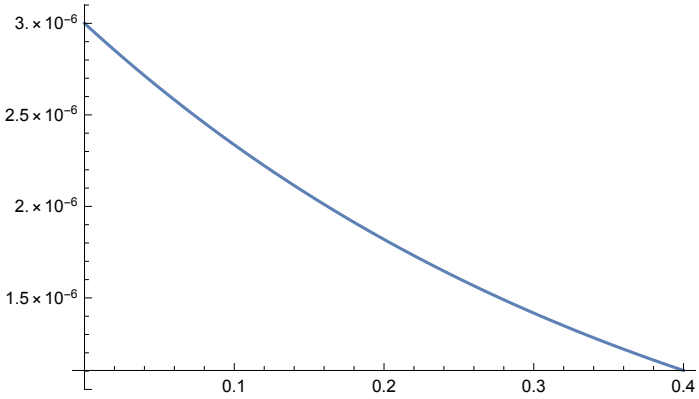
Diff eq.

In[1389]:=
```
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

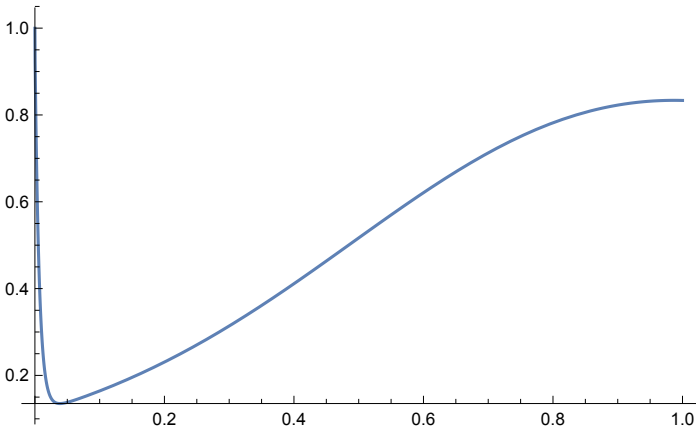
In[1392]:=
```
caFunc[t_] := 3*^-6 * Exp[-t / tauOfDecayOfUncagedCa];;
Plot[caFunc[t], {t, 0, 0.4}, PlotRange → All]
```

Out[1393]=

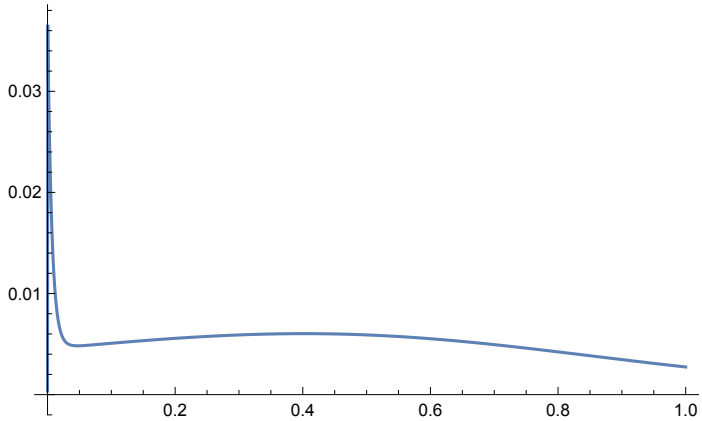


In[1394]:=
```
myNDSolveResults = NDSolve[eq, {ss1, ss2, ss3, ss4}, {t, 0, 10.}];
tEndForPlot = 1.;
Plot[(ss1[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
Plot[(ss2[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
Plot[(ss3[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
Plot[(ss4[t] /. myNDSolveResults), {t, 0, tEndForPlot}, PlotRange → All]
```

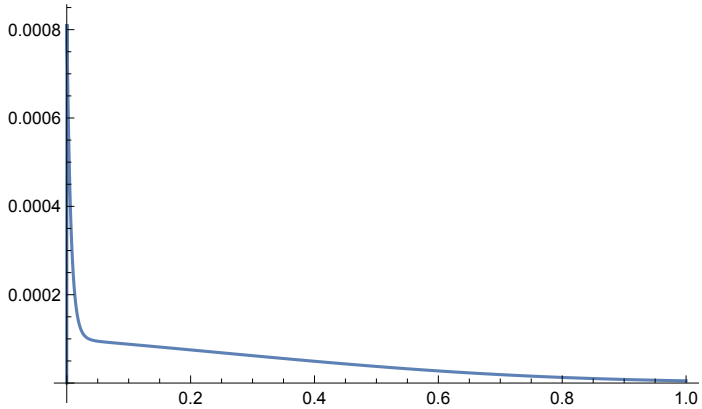
Out[1396]=



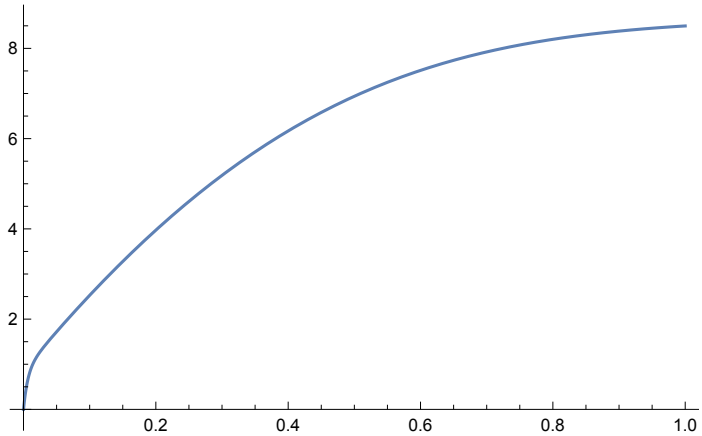
Out[1397]=



Out[1398]=



Out[1399]=



Loop

make lists for later

In[1400]:=
```
simCaList = Table[0, {runs}];
simParamNv = Table[0, {7}, {runs}];
```

C5

In[1402]:=
```
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[1407]:=
```
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[1412]:=
```
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[1417]:=
```
baselineLong = Table[{ttt, 0}, {ttt, -0.05, -1*^-6, dtOfDataLong}];
```

Loop

In[1418]:=
```
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]];
```

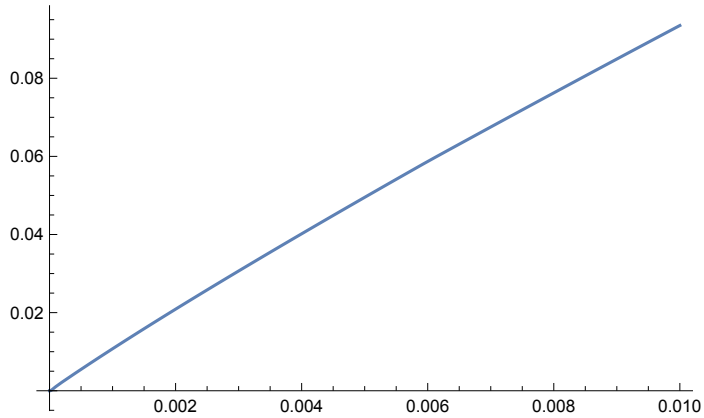
```
    (*amp1*)
    simParamNoiseD[[15, noiseN]] = simParamNoiseD[[10, noiseN]];
    (*tau1*)
    simParamNoiseD[[16, noiseN]] = simParamNoiseD[[11, noiseN]];(*tau2*)
    ,
    (*take mono*)
    Print["take mono"];
    simParamNoiseD[[12, noiseN]] = simParamNoiseD[[3, noiseN]];
    (*delay*)
    simParamNoiseD[[13, 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*)
```

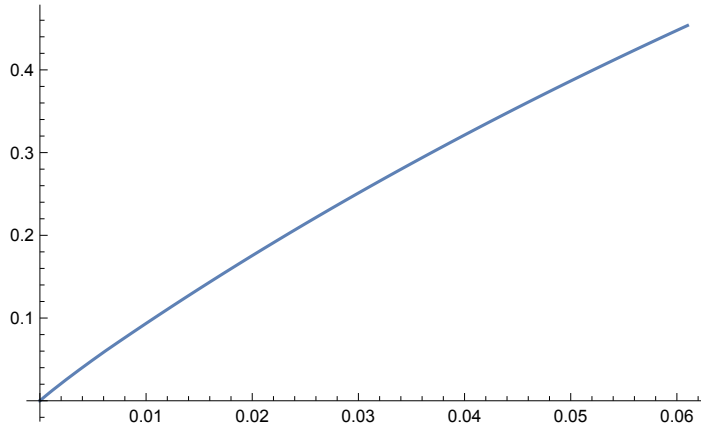
```
For[p = 1, p ≤ numberOfFitParamToBeSaved, p += 1,
 simParamMedianD[[p, r]] =
  Median[simParamNoiseD[[p, All]] /. NaN → Sequence[]];
 simParamQuantile1D[[p, r]] = Quantile[
   simParamNoiseD[[p, All]] /. NaN → Sequence[], myQuantile1];
 simParamQuantile2D[[p, r]] = Quantile[
   simParamNoiseD[[p,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

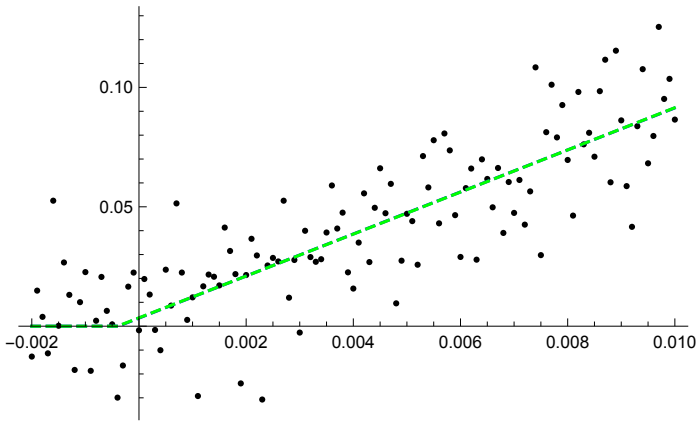

Mono: chi2 = 0.045529 d = 0.045529 a = 2.77991×10^{6} t = 315 826.

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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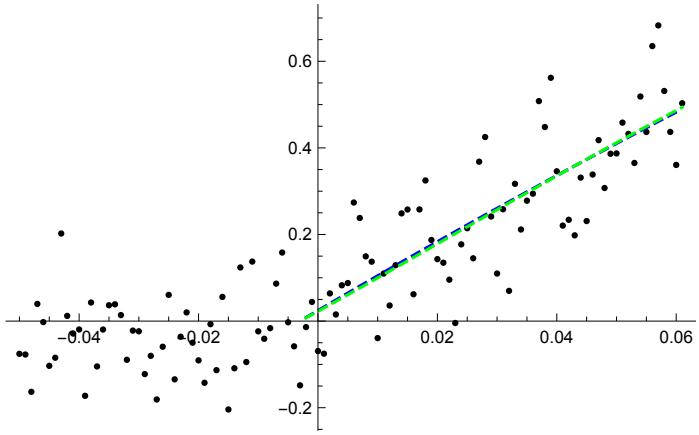


```
Mono: chi2 = 1.13349      d = -0.003      a = 3.96848      t = 0.485923
Bi: ratio chi2Mono/chi2Bi = 0.999521      d = -0.003      a =
 1.91103      a1 = -0.182588      t1 =0.0415653      t2 = 0.176371
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----------------     Ca = 0.729825
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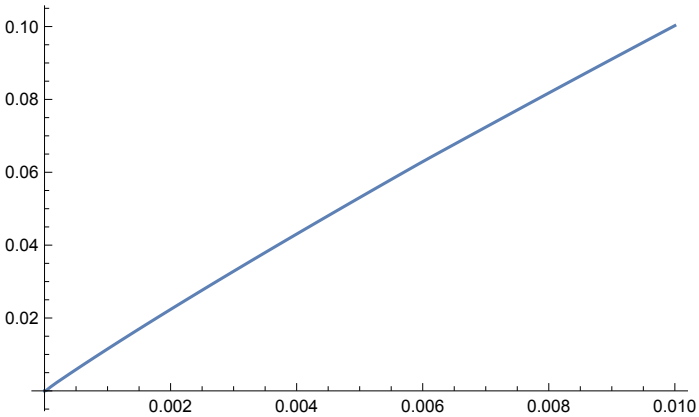

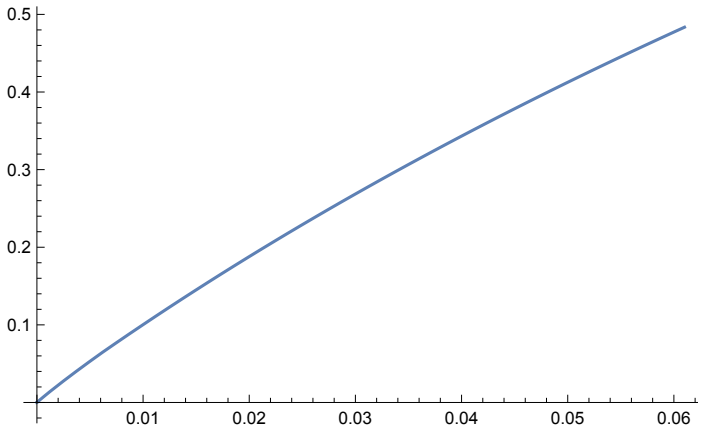

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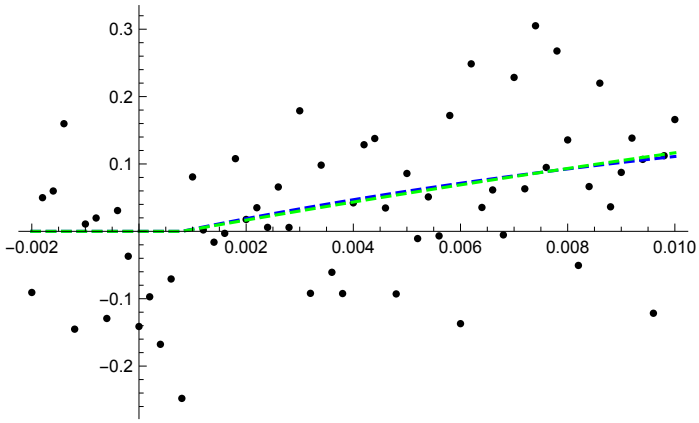


```
Mono: chi2 = 0.635202     d = 0.635202     a = 0.234827     t = 0.0143561
Bi: ratio chi2Mono/chi2Bi = 0.999507     d = 0.0008     a =
 0.87096     a1 = 0.579257     t1 =0.0415693     t2 = 1.73007
Long trace was used for fitting.
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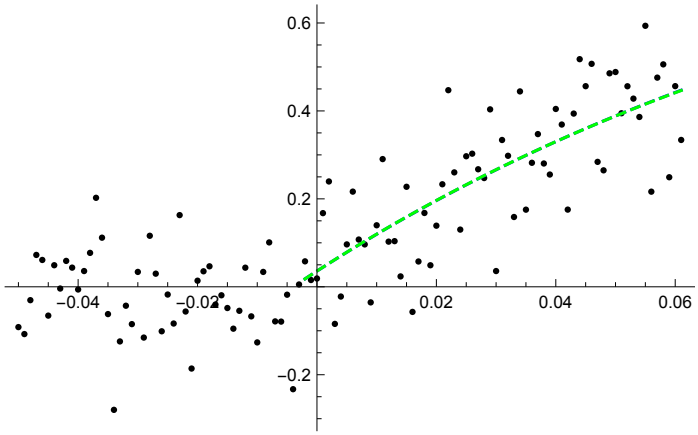


```
Mono: chi2 = 1.18239     d = -0.004     a = 1.00778     t = 0.110888
Bi: ratio chi2Mono/chi2Bi = 1.00002     d = -0.004     a =
 0.73437     a1 = 1.12628     t1 =0.116297     t2 = 0.678501
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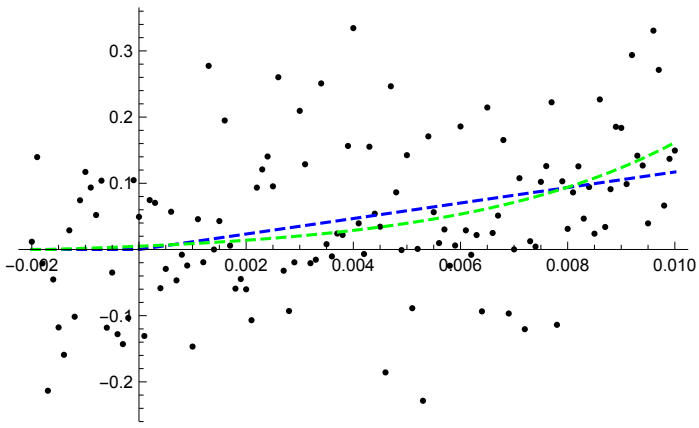

```
Mono: chi2 = 1.39325     d = 1.39325     a = 6.36905 × 10^6     t = 543623.
Bi: ratio chi2Mono/chi2Bi = 1.01485     d = -0.0017     a =
 -0.280768     a1 = -0.00856142     t1 =-0.00392744     t2 = -1.85241
Long trace was used for fitting.
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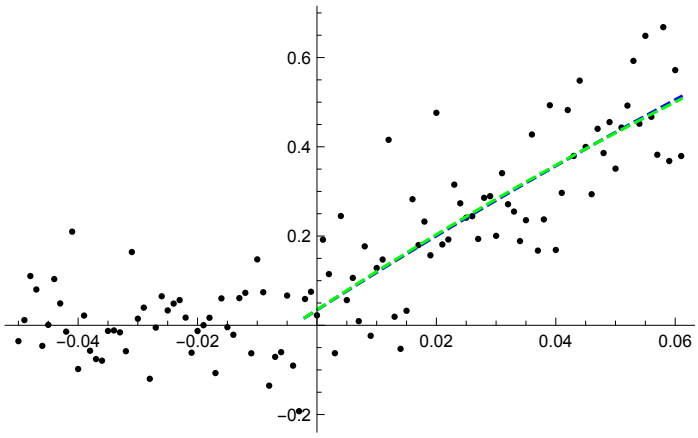


```
Mono: chi2 = 1.00984      d = -0.004      a = 3.03298      t = 0.351024
Bi: ratio chi2Mono/chi2Bi = 0.999093      d = -0.004      a =
 1.87646      a1 = -0.0076668      t1 =0.0154707      t2 = 0.203778
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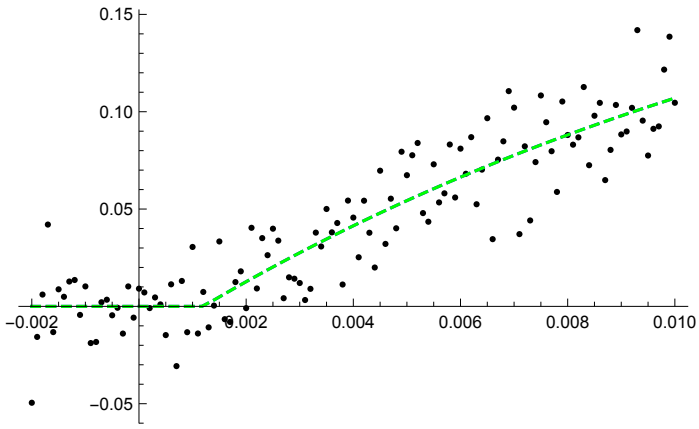


```
Mono: chi2 = 0.037233     d = 0.037233     a = 0.232881     t = 0.014308
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.00119921     a =
 0.417647     a1 = 0.228425     t1 =0.0141487     t2 = 1.38258
Long trace was used for fitting.
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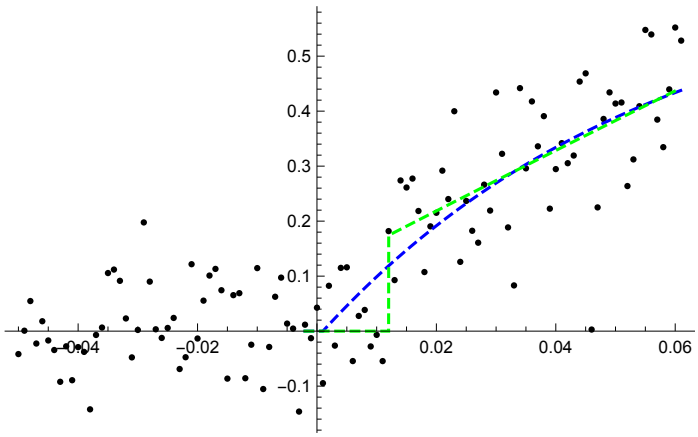
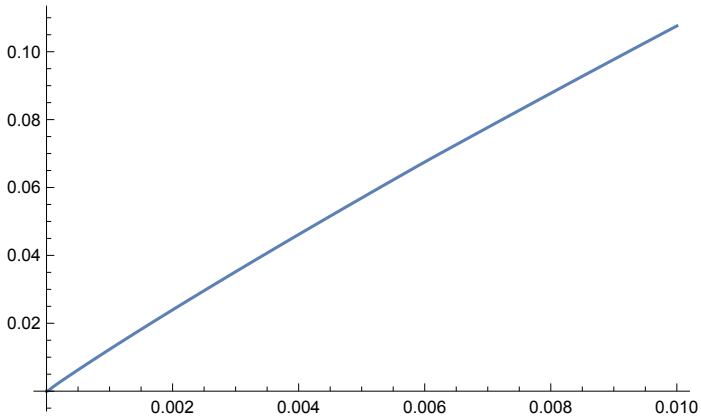
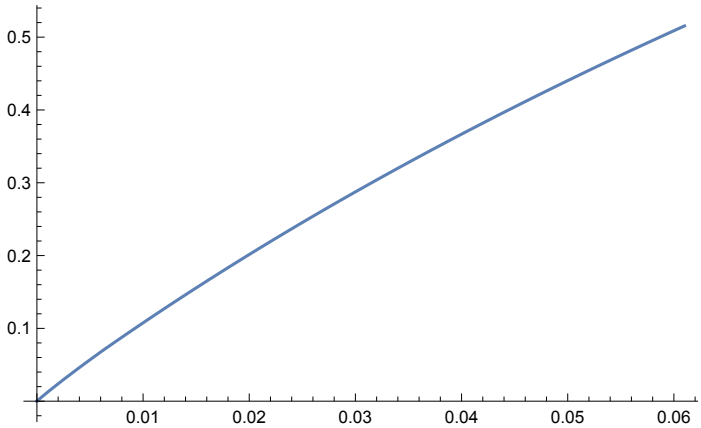


Mono: chi2 = 0.894792 d = 0.001 a = 0.665997 t = 0.0560011

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

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





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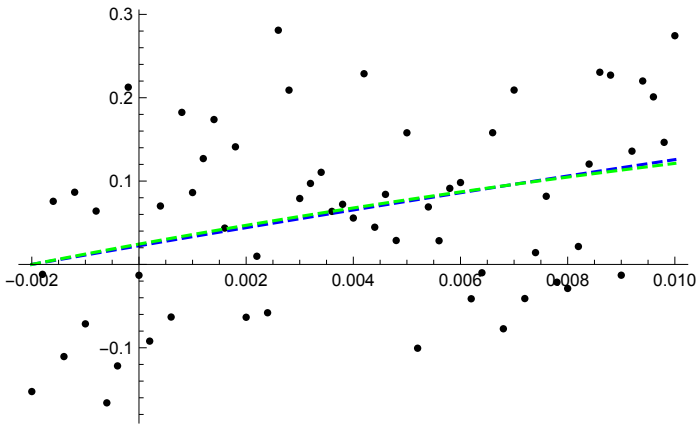


```
Mono: chi2 = 0.637024     d = 0.637024     a = 0.867192     t = 0.0766031
Bi: ratio chi2Mono/chi2Bi = 1.00031     d = -0.002     a =
 -0.503735     a1 = 0.295347     t1 =0.0241826     t2 = -1.68935
Long trace was used for fitting.
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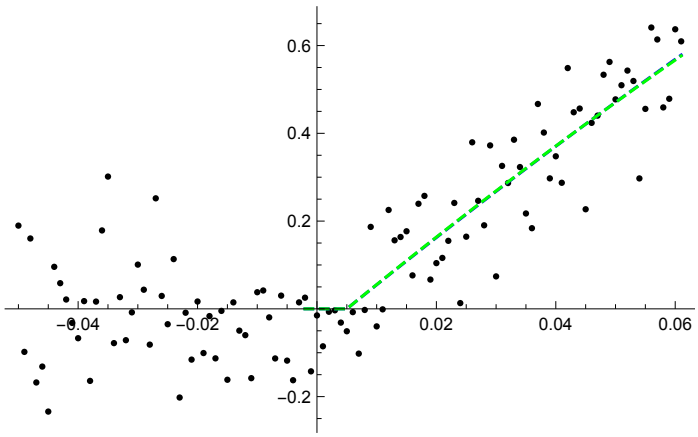


```
Mono: chi2 = 1.17196     d = 0.005     a = 4.62144     t = 0.41887
Bi: ratio chi2Mono/chi2Bi = 0.999928     d = 0.005     a =
 -2.60508     a1 = 5.97509     t1 =0.431391     t2 = 3.15514
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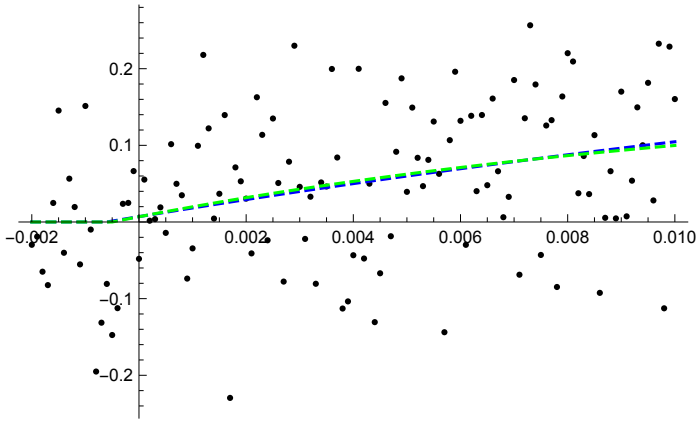


```
Mono: chi2 = 1.08877     d = 1.08877     a = 0.346068     t = 0.0294338
Bi: ratio chi2Mono/chi2Bi = 1.00095     d = -0.0005     a =
 0.422197     a1 = 0.169393     t1 =0.0123168     t2 = 0.991955
Long trace was used for fitting.
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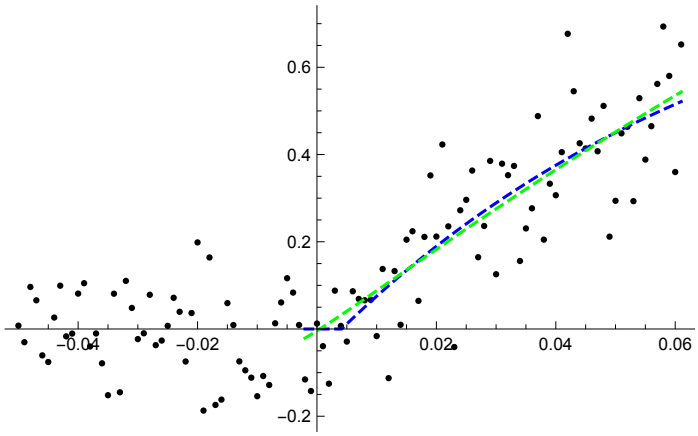


```
Mono: chi2 = 1.21055     d = 0.00412708     a = 0.943694     t = 0.0707459

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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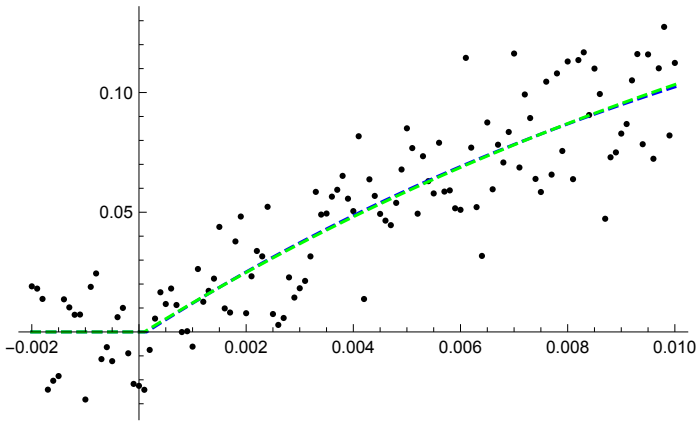


```
Mono: chi2 = 0.0381152     d = 0.0381152     a = 0.205463     t = 0.0142969
Bi: ratio chi2Mono/chi2Bi = 0.999503     d = 0.0001     a =
 0.823864     a1 = 0.202376     t1 =0.0155     t2 = 0.785006
Long trace was used for fitting.
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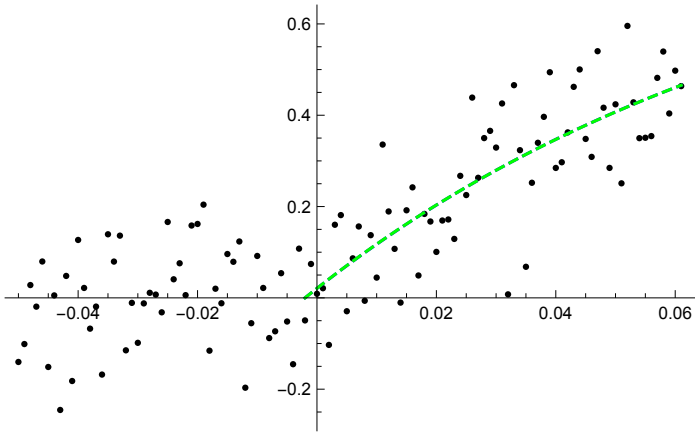


```
Mono: chi2 = 1.20257     d = -0.002     a = 0.883191     t = 0.0841135
Bi: ratio chi2Mono/chi2Bi = 0.999936     d = -0.002     a =
 0.96287     a1 = 0.359212     t1 =0.0623215     t2 = 0.126195
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----------------     Ca = 0.788054
  uM         -------------------------------------------------------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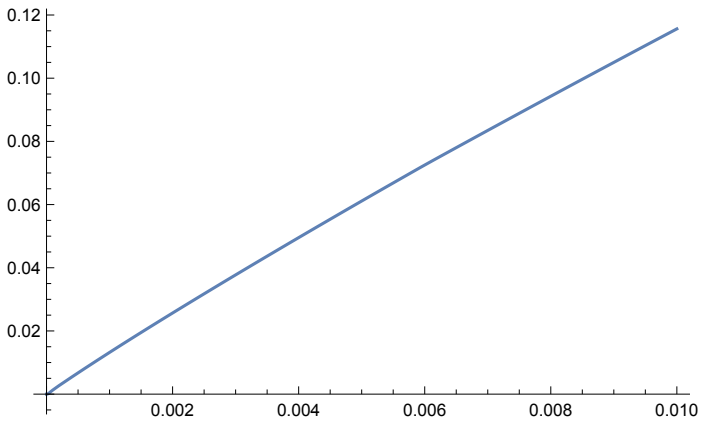

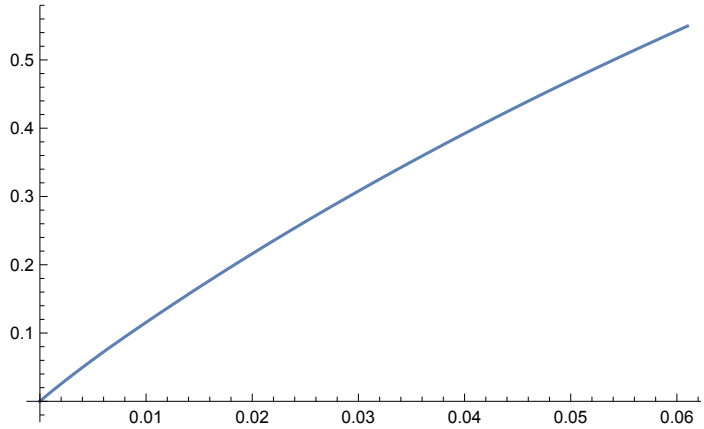

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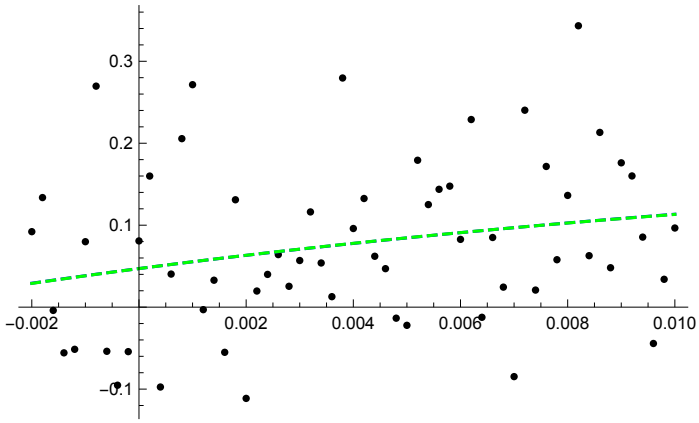


```
Mono: chi2 = 0.592291     d = 0.592291     a = 0.211008     t = 0.0192932
Bi: ratio chi2Mono/chi2Bi = 1.00002     d = -0.00481566     a =
 0.15033     a1 = 0.245031     t1 =0.0202609     t2 = 0.0929426
Long trace was used for fitting.
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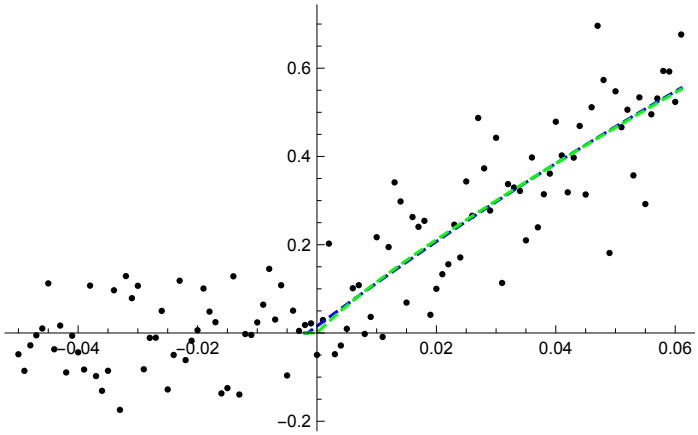

Mono: chi2 = 1.02757 d = -0.00154517 a = 2.49267 t = 0.24826

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

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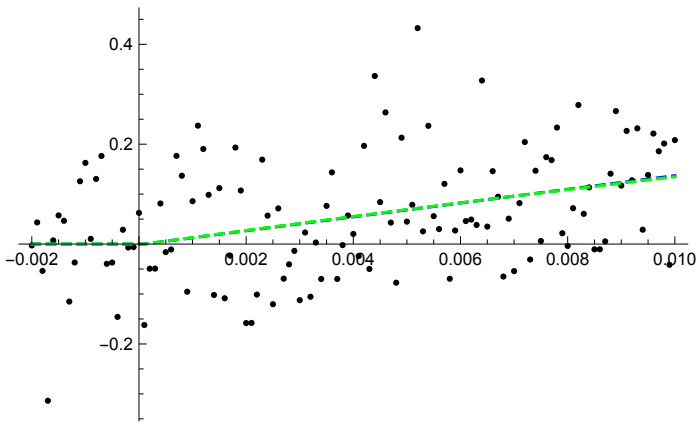

```
Mono: chi2 = 1.5224     d = 1.5224     a = 3.39062     t = 0.240294
Bi: ratio chi2Mono/chi2Bi = 0.999634     d = 0.0001     a =
 1.5004     a1 = 0.285363     t1 =0.0437891     t2 = 0.151062
Long trace was used for fitting.
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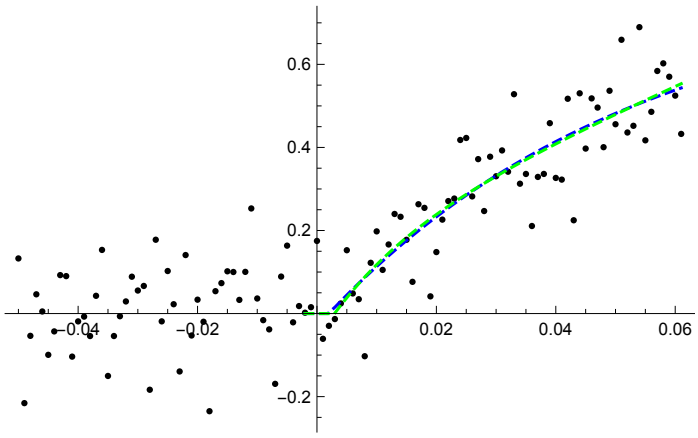


```
Mono: chi2 = 1.0147     d = 0.002     a = 0.808602     t = 0.0529592
Bi: ratio chi2Mono/chi2Bi = 1.0018     d = 0.00294503     a =
 13.1046     a1 = 0.17798     t1 =0.0137973     t2 = 1.95611
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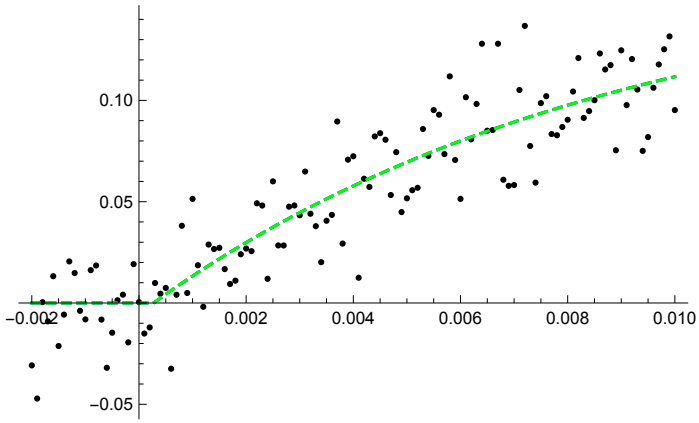


```
Mono: chi2 = 0.0429621     d = 0.0429621     a = 0.166153     t = 0.00871987

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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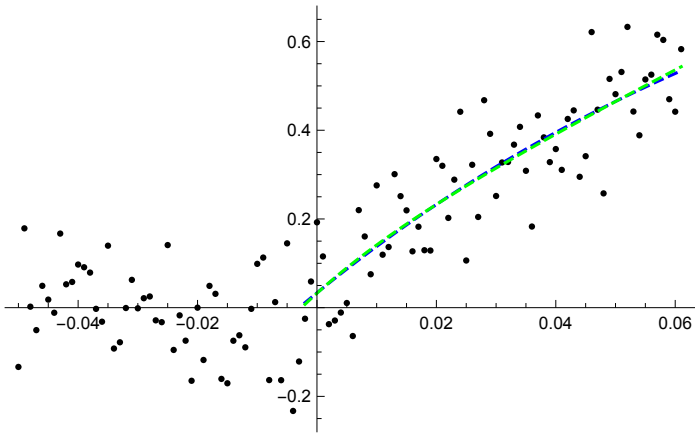


```
Mono: chi2 = 1.00262     d = -0.003     a = 1.12121     t = 0.0989511
Bi: ratio chi2Mono/chi2Bi = 1.00174     d = -0.00257927     a =
 6.07177     a1 = 0.0834601     t1 =0.0151013     t2 = 0.79381
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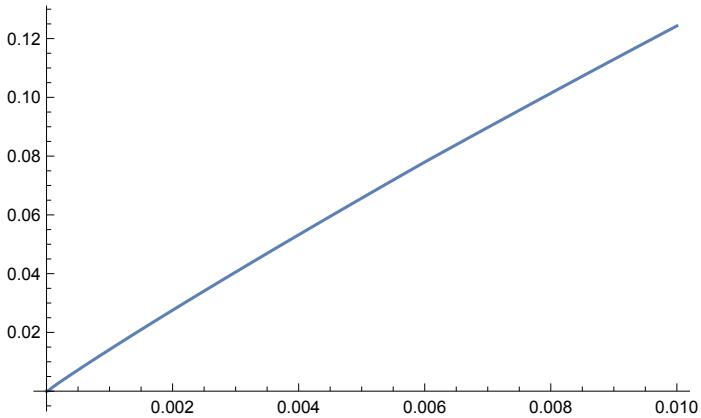
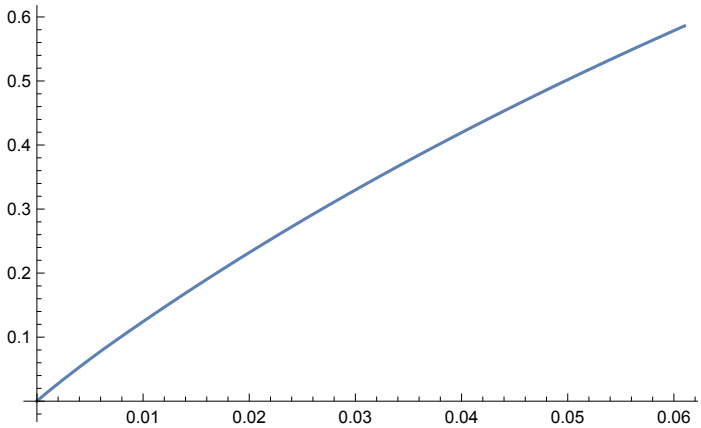
---------- Ca = 0.820427

uM ----------





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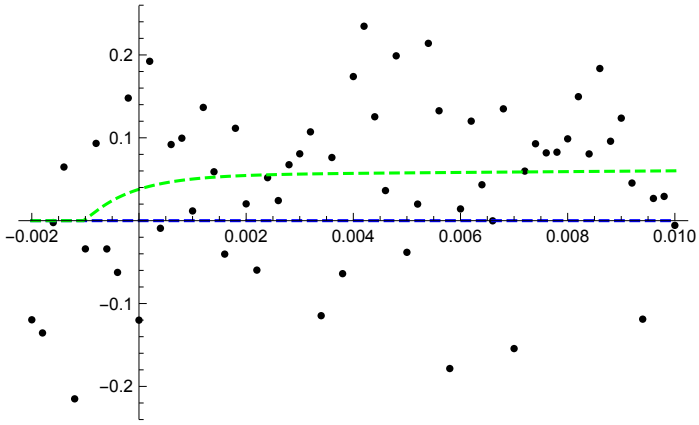


```
Mono: chi2 = 0.716818     d = 0.716818     a = -0.1421     t = 0.0662819
Bi: ratio chi2Mono/chi2Bi = 1.29569     d = -0.001     a =
 0.438403     a1 = 0.0548207     t1 =0.00087317     t2 = 0.784282
Long trace was used for fitting.
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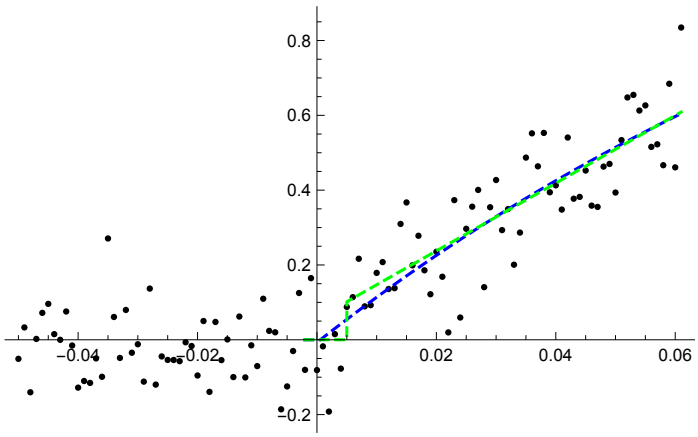

Mono: chi2 = 1.07746 d = 0.000560305 a = 1.64062 t = 0.131421

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

---------- C10

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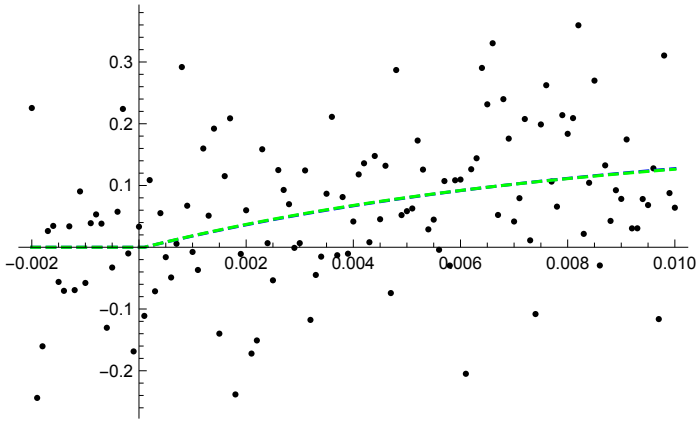


```
Mono: chi2 = 1.51613     d = 1.51613     a = 0.190579     t = 0.0089818
Bi: ratio chi2Mono/chi2Bi = 0.999965     d = 0.0001     a =
 0.669314     a1 = 0.169382     t1 =0.00801099     t2 = 0.79491
Long trace was used for fitting.
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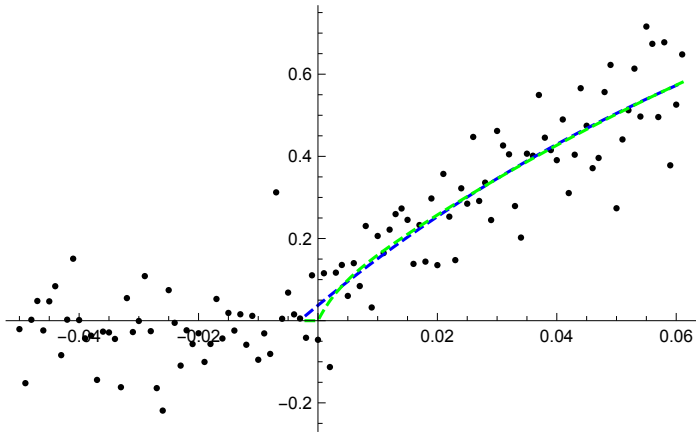

Mono: chi2 = 0.894554 d = −0.00307589 a = 1.20092 t = 0.0973702

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

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

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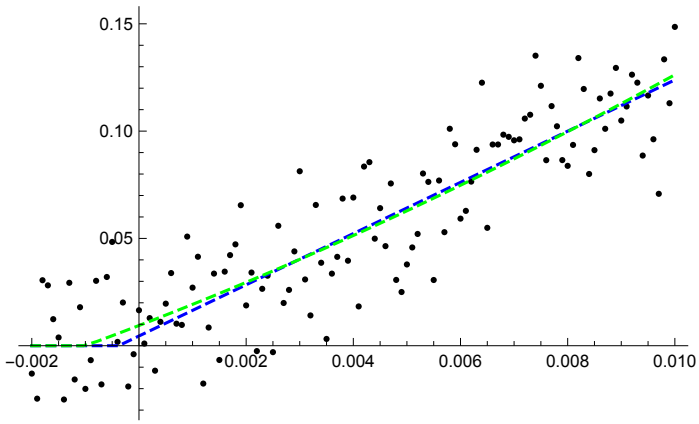


```
Mono: chi2 = 0.0534952     d = 0.0534952     a = 993 334.     t = 83 248.
Bi: ratio chi2Mono/chi2Bi = 1.00824     d = -0.001     a =
 9.08666     a1 = -14.9866     t1 =0.100406     t2 = 0.151928
Long trace was used for fitting.
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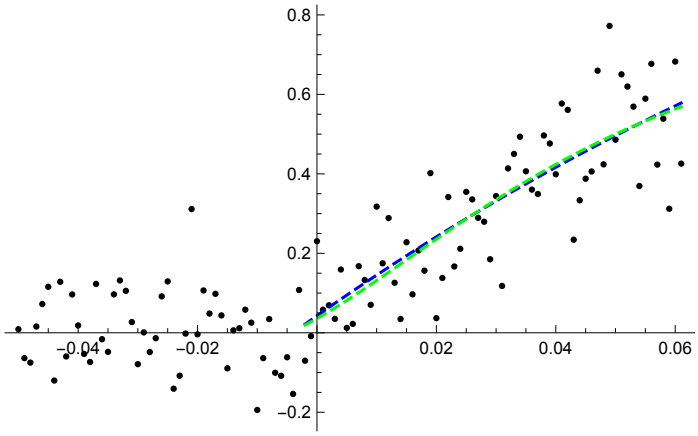


```
Mono: chi2 = 1.2462     d = -0.004     a = 1.72596     t = 0.159305
Bi: ratio chi2Mono/chi2Bi = 1.00522     d = -0.00470136     a =
 0.797901     a1 = -7.09257     t1 =0.028186     t2 = 0.0305472
-------------------------------------------------------------------------------------------
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----------------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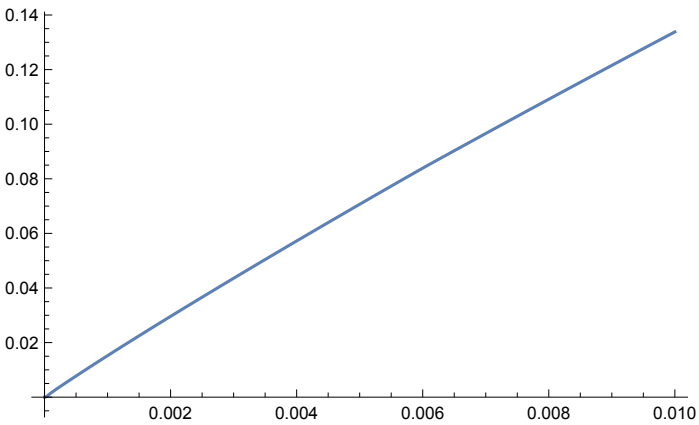

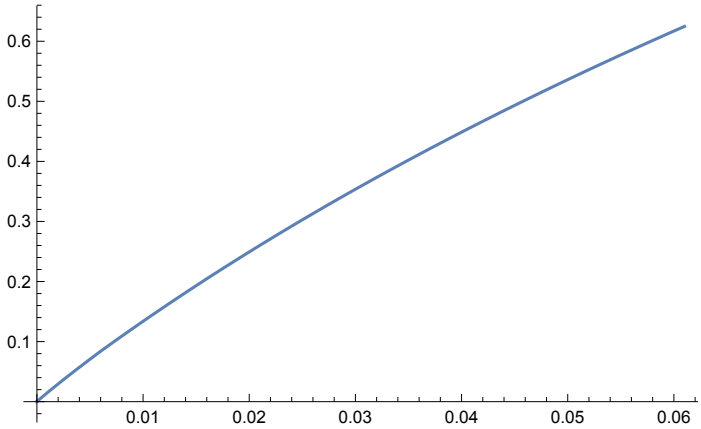

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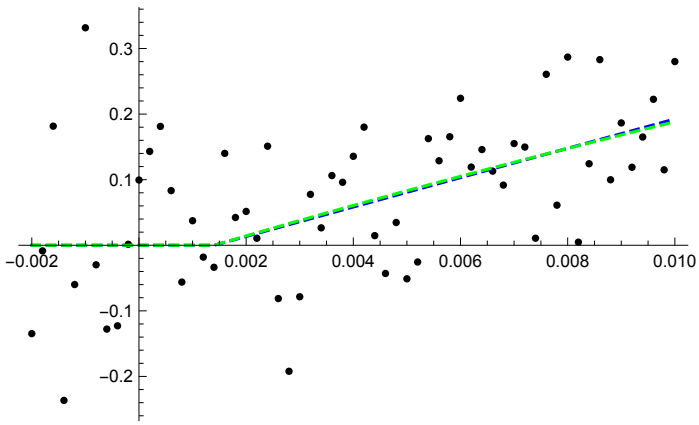


```
Mono: chi2 = 0.660714     d = 0.660714     a = 22.5304     t = 1.00247
Bi: ratio chi2Mono/chi2Bi = 0.999002     d = 0.0014     a =
 1.80063     a1 = 0.736098     t1 =0.0377745     t2 = 0.234041
Long trace was used for fitting.
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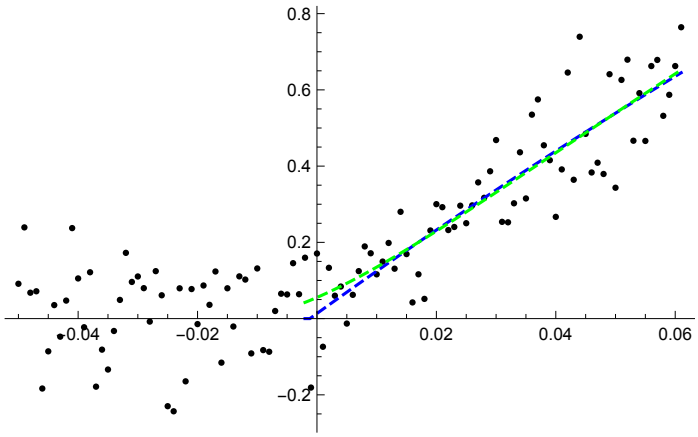


```
Mono: chi2 = 1.26002     d = -0.00119079     a = 4.06811     t = 0.360269
Bi: ratio chi2Mono/chi2Bi = 1.01042     d = -0.0141974     a =
 4.55494     a1 = -0.209248     t1 =0.0166325     t2 = 0.378052
------------------------------------------------------------------------ C10
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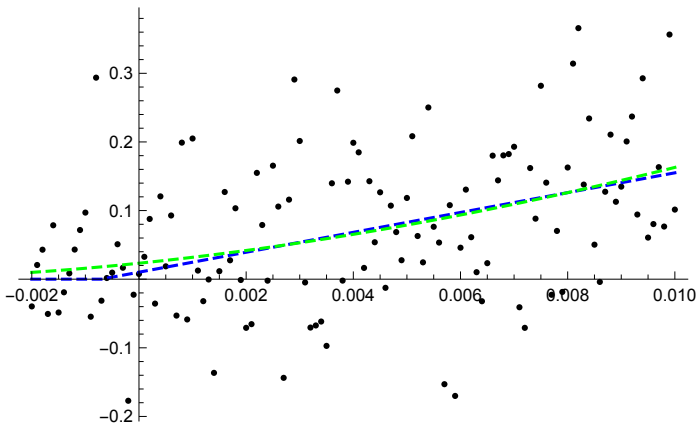

```
Mono: chi2 = 1.28252     d = 1.28252     a = 15.3273     t = 1.05284
Bi: ratio chi2Mono/chi2Bi = 1.01037     d = -0.00578349     a =
 9.40562     a1 = -11.1163     t1 =0.0578258     t2 = 0.106849
Long trace was used for fitting.
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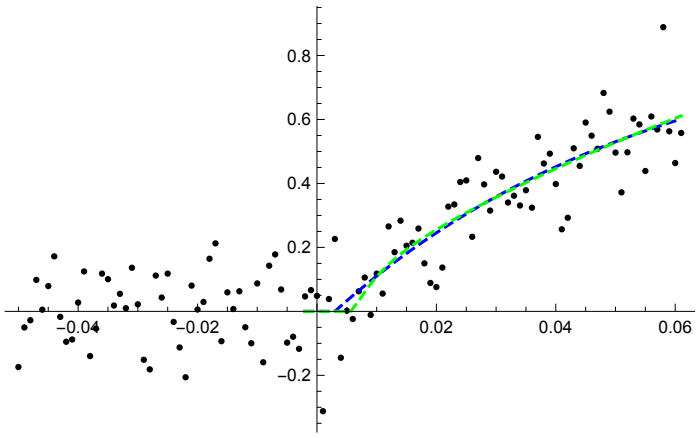


```
Mono: chi2 = 1.26002     d = 0.00299506     a = 0.921469     t = 0.0548519
Bi: ratio chi2Mono/chi2Bi = 1.00854     d = 0.006     a =
 1.48793     a1 = 0.111991     t1 =0.0047133     t2 = 0.122132
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LinearAlgebra`BLAS`TRSV: Machine overflow encountered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

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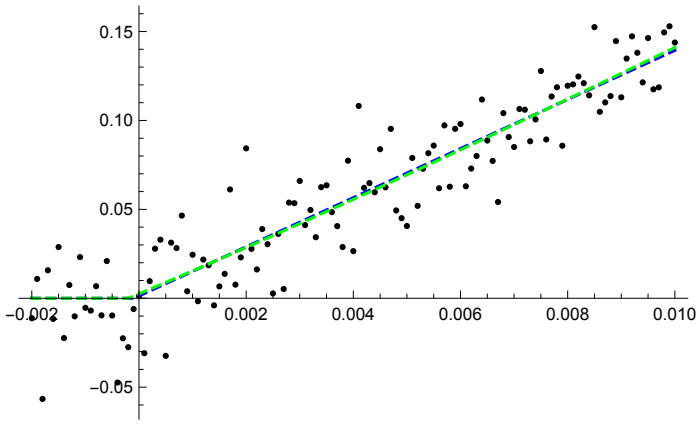

Mono: chi2 = 0.0452279 d = 0.0452279 a = 5.48155×10^6 t = 396 917.

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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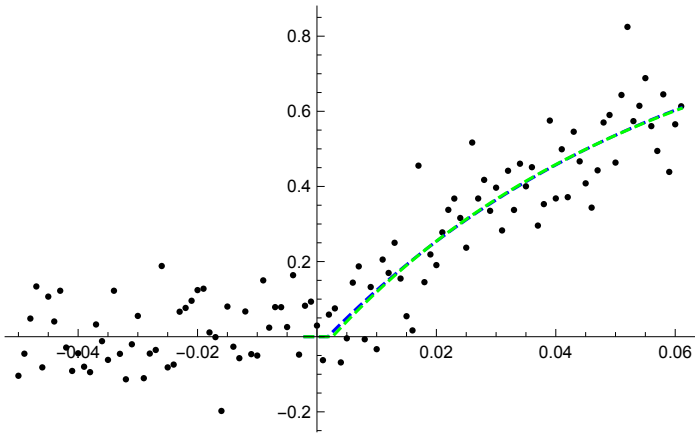


```
Mono: chi2 = 0.936636     d = 0.00181969     a = 0.972639     t = 0.060104
Bi: ratio chi2Mono/chi2Bi = 1.00035     d = 0.00259233     a =
 1.68453     a1 = 0.626379     t1 =0.0424429     t2 = 0.413423
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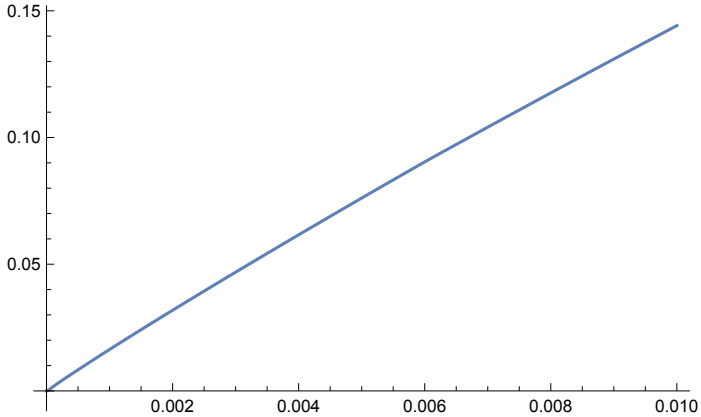
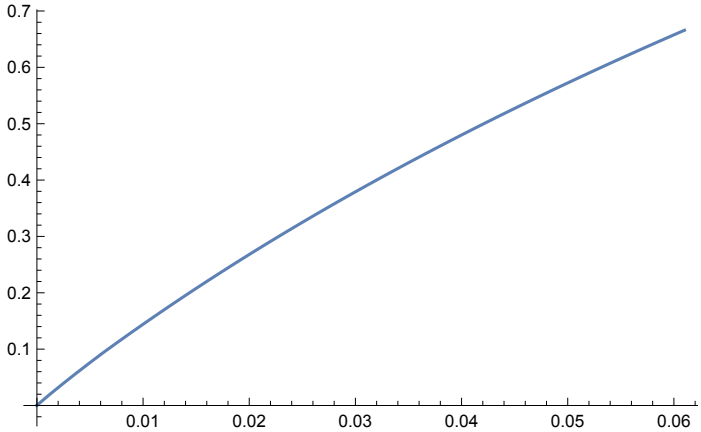
---------- Ca = 0.890526
uM ----------





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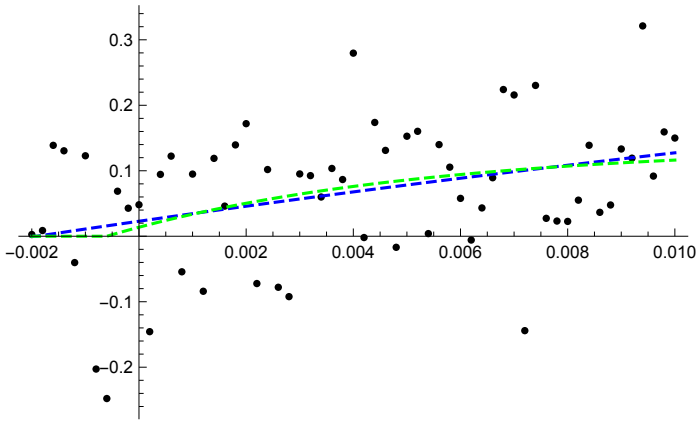


```
Mono: chi2 = 0.618601     d = 0.618601     a = 0.517952     t = 0.0421719
Bi: ratio chi2Mono/chi2Bi = 1.01324     d = -0.0006     a =
 -0.432618     a1 = 0.131787     t1 =0.00553428     t2 = -1.53185
Long trace was used for fitting.
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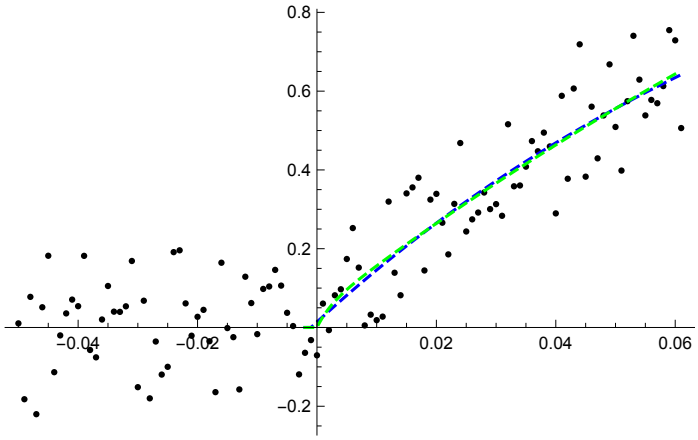

Mono: chi2 = 1.14931 d = -0.001 a = 1.35258 t = 0.096354

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

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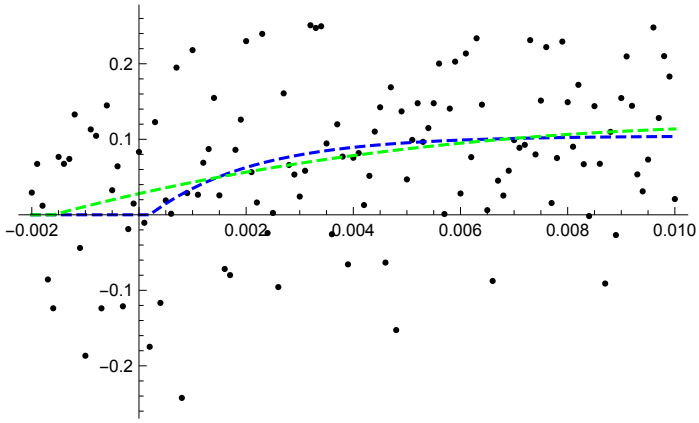


```
Mono: chi2 = 1.11448     d = 1.11448     a = 0.104372     t = 0.00195984
Bi: ratio chi2Mono/chi2Bi = 0.989862     d = -0.0016     a =
 1.72045     a1 = 0.376356     t1 =0.0136518     t2 = -0.158981
Long trace was used for fitting.
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FittedModel: 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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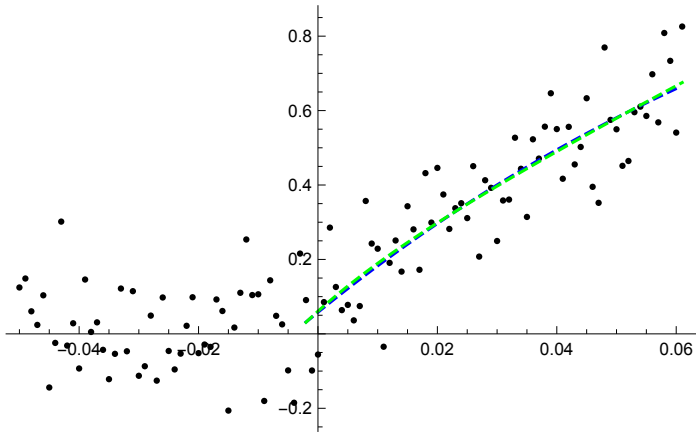


```
Mono: chi2 = 1.27853     d = -0.00435729     a = 1.4669     t = 0.10788

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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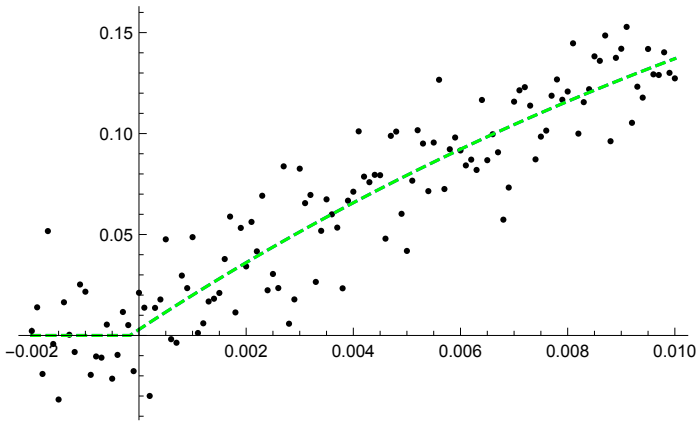


```
Mono: chi2 = 0.0432638     d = 0.0432638     a = 0.315839     t = 0.0178549
Bi: ratio chi2Mono/chi2Bi = 1.     d = -0.000169194     a =
 0.913905     a1 = 0.390079     t1 =0.0202322     t2 = -0.317825
Long trace was used for fitting.
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LinearAlgebra`BLAS`TRSV: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

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

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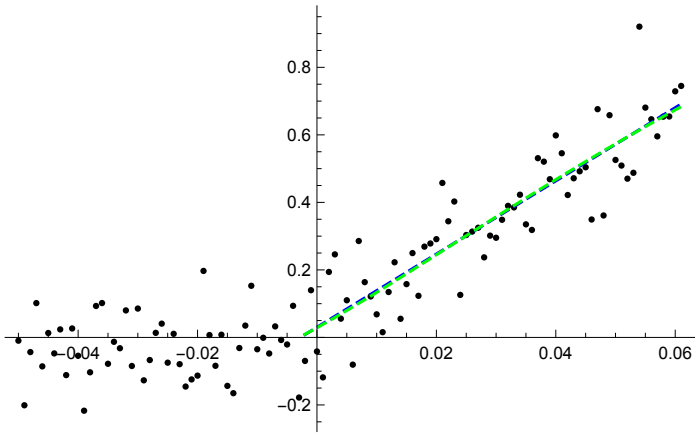
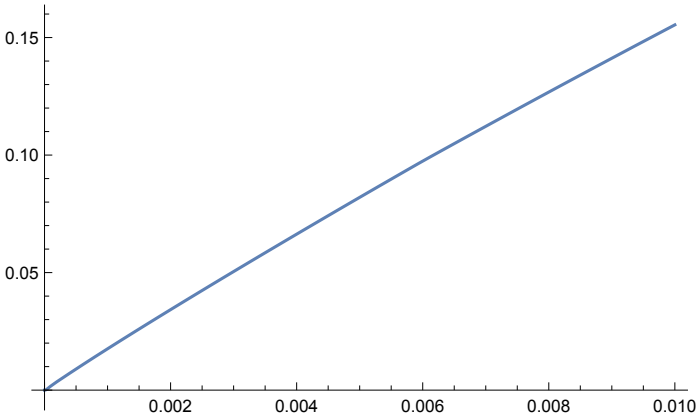


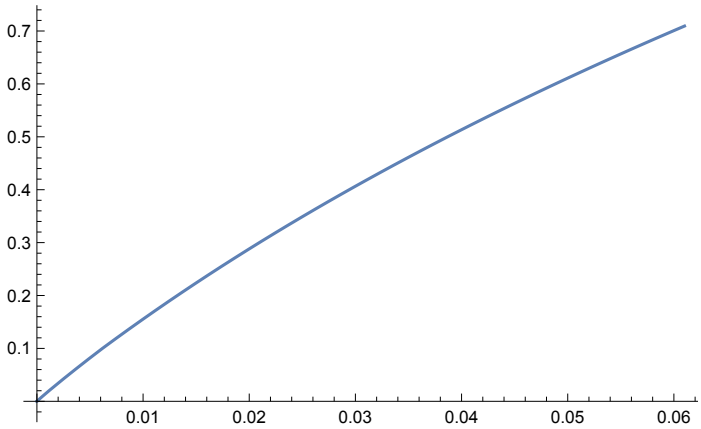
Mono: chi2 = 1.06516 d = -0.00278025 a = 4.16305×10^{7} t = 3.84094×10^{6}

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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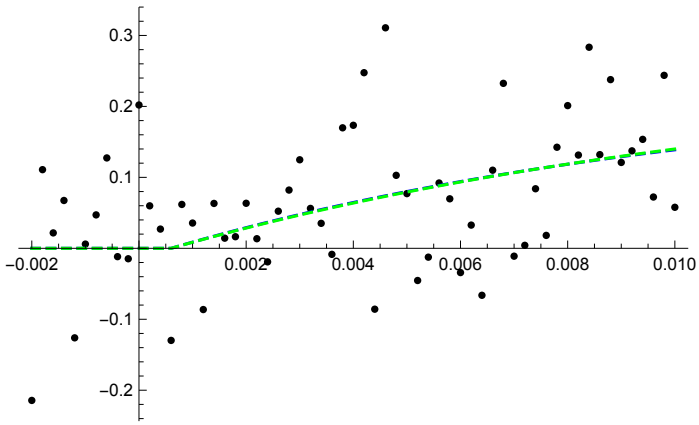


```
Mono: chi2 = 0.524381     d = 0.524381     a = 0.238454     t = 0.0107692
Bi: ratio chi2Mono/chi2Bi = 1.00018     d = 0.0006     a =
 -1.00823     a1 = 0.229574     t1 =0.0110884     t2 = -1.33542
Long trace was used for fitting.
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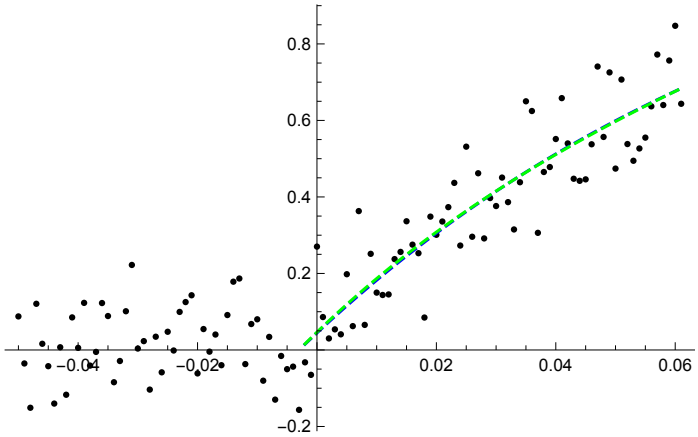


```
Mono: chi2 = 1.01471     d = -0.003     a = 1.30741     t = 0.0864791
Bi: ratio chi2Mono/chi2Bi = 1.00132     d = -0.003     a =
 1.75385     a1 = 0.141537     t1 =0.0269786     t2 = 0.15161
------------------------------------------------------------------------ C10
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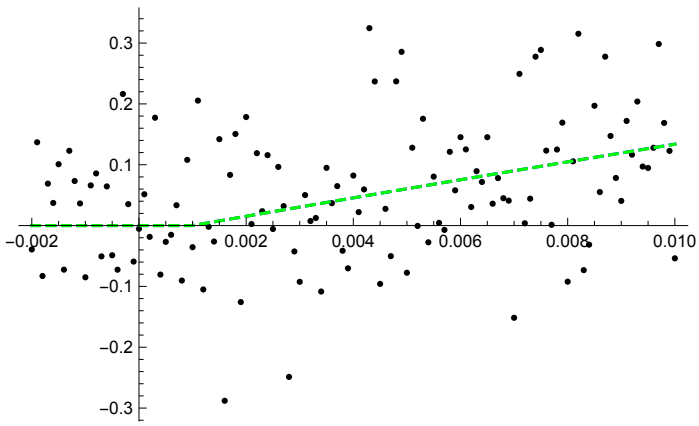

```
Mono: chi2 = 1.36623     d = 1.36623     a = 2.32075     t = 0.151548
Bi: ratio chi2Mono/chi2Bi = 0.999996     d = 0.001     a =
 2.92632     a1 = 1.01228     t1 =0.10102     t2 = 0.359077
Long trace was used for fitting.
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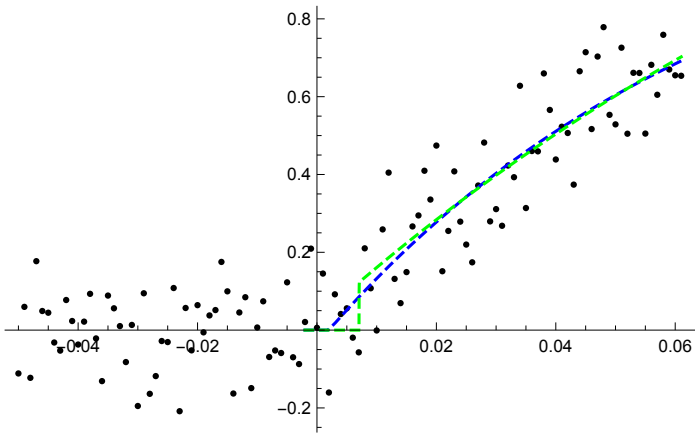


```
Mono: chi2 = 1.16337     d = 0.002     a = 1.18923     t = 0.0676881
Bi: ratio chi2Mono/chi2Bi = 1.02077     d = 0.00703963     a =
 1.87136     a1 = 0.122617     t1 =0.00001346     t2 = 0.133999
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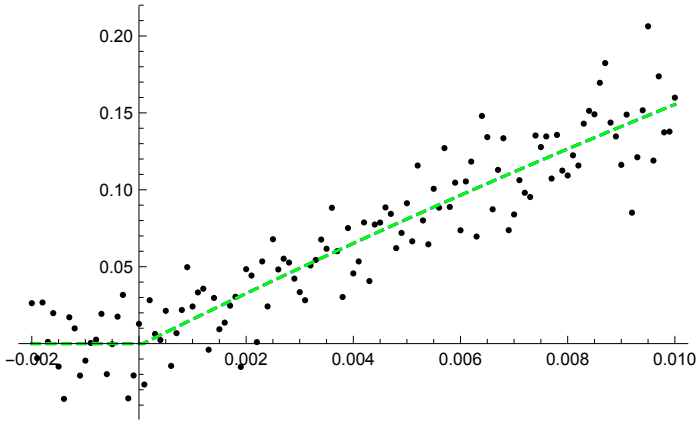


```
Mono: chi2 = 0.051556     d = 0.051556     a = 0.869032     t = 0.0503597

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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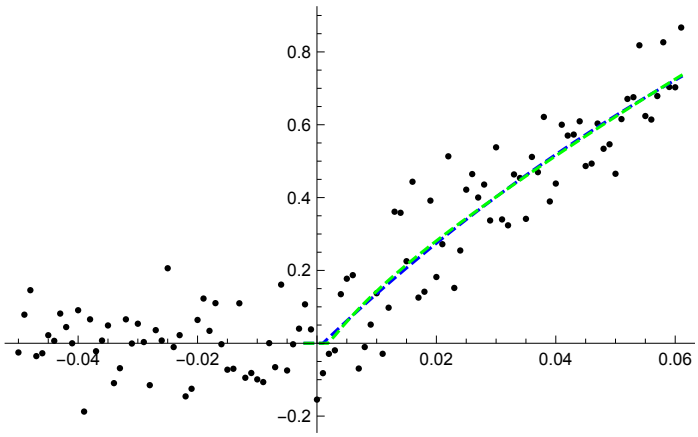


```
Mono: chi2 = 0.975618     d = 0.001     a = 1.78944     t = 0.114058
Bi: ratio chi2Mono/chi2Bi = 1.0051     d = 0.002     a =
 3.35411     a1 = 0.0683858     t1 =0.00786936     t2 = 0.260004
-------------------------------------------------------------------------------------
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----------------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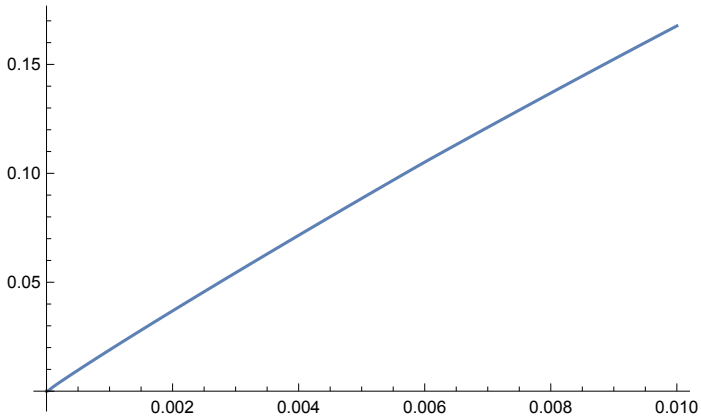

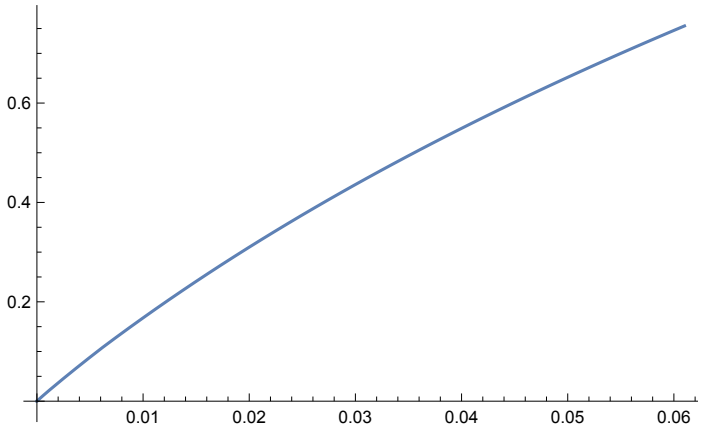


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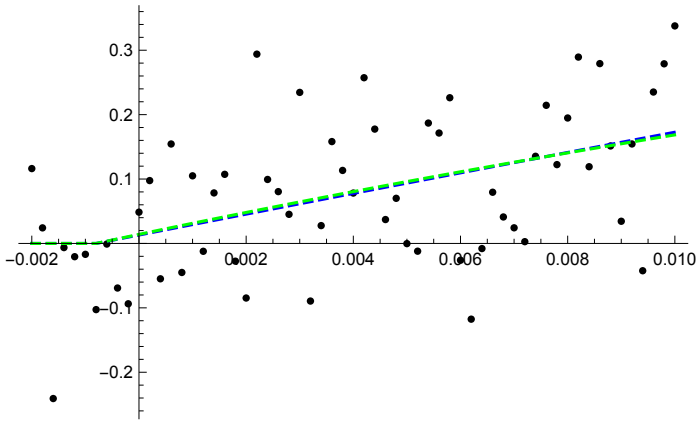


```
Mono: chi2 = 0.659449     d = 0.659449     a = 4.06207     t = 0.248633
Bi: ratio chi2Mono/chi2Bi = 0.999054     d = -0.0008     a =
 -1.23318     a1 = 0.554019     t1 =0.0351684     t2 = -0.880932
Long trace was used for fitting.
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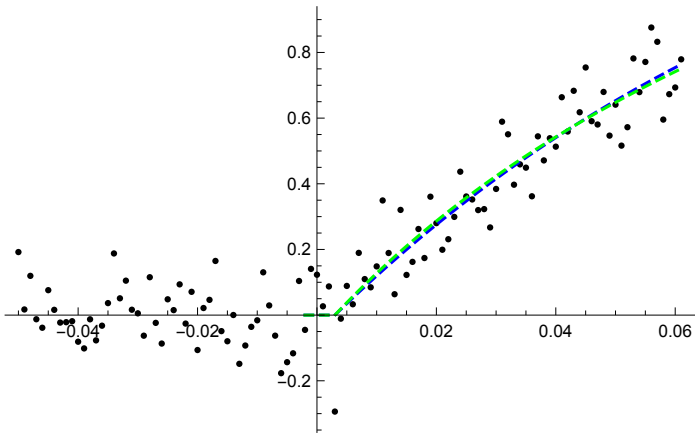


```
Mono: chi2 = 0.900266     d = 0.003     a = 1.62961     t = 0.0917729
Bi: ratio chi2Mono/chi2Bi = 0.998571     d = 0.003     a =
 1.73441     a1 = 0.194068     t1 =0.0288959     t2 = 0.122117
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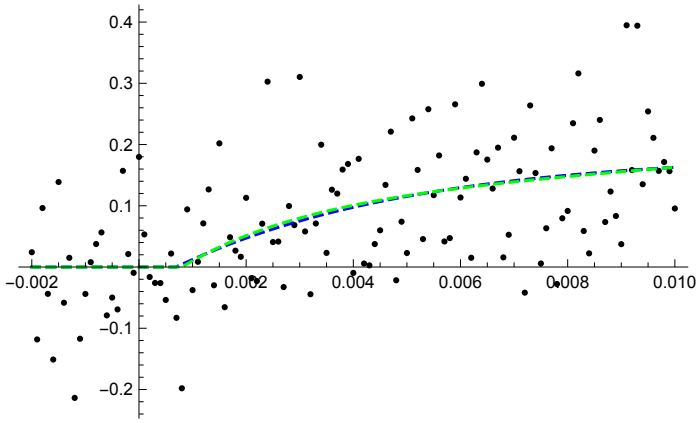


```
Mono: chi2 = 1.09675     d = 1.09675     a = 0.18525     t = 0.00440797
Bi: ratio chi2Mono/chi2Bi = 1.00291     d = 0.0008     a =
 -1.47315     a1 = 0.109595     t1 =0.00233673     t2 = -0.26748
Long trace was used for fitting.
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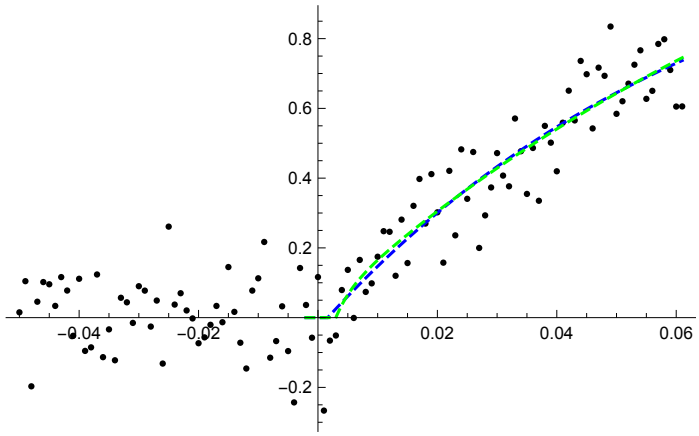


```
Mono: chi2 = 1.08186     d = 0.00163318     a = 1.25571     t = 0.0671113

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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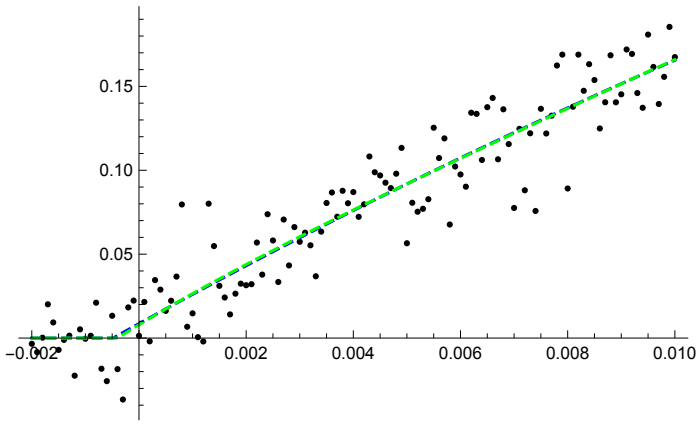


```
Mono: chi2 = 0.0447082     d = 0.0447082     a = 0.733287     t = 0.0409472
Bi: ratio chi2Mono/chi2Bi = 1.00227     d = -0.0004     a =
 1.81899     a1 = 0.00995385     t1 =0.00223088     t2 = 0.115244
Long trace was used for fitting.
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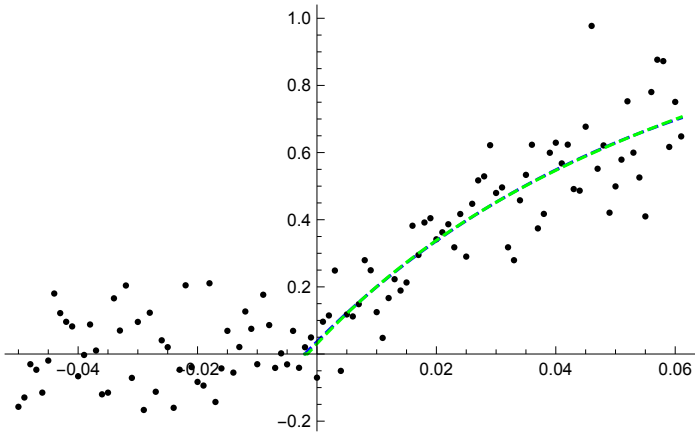


```
Mono: chi2 = 1.31582     d = -0.0020262     a = 1.04993     t = 0.0568866
Bi: ratio chi2Mono/chi2Bi = 1.00022     d = -0.00158852
      a = 8.07046     a1 = 0.539593     t1 =0.0348257     t2 = 1.81137
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----------------     Ca = 1.01226
  uM    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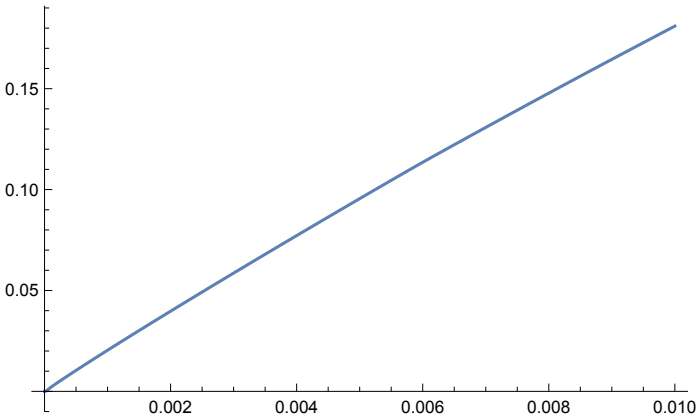

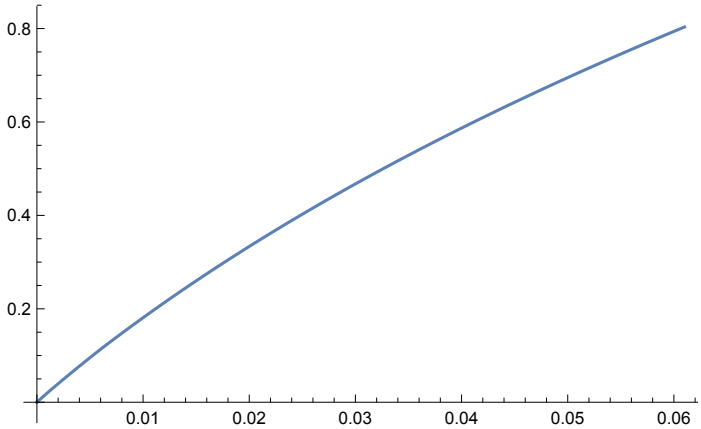

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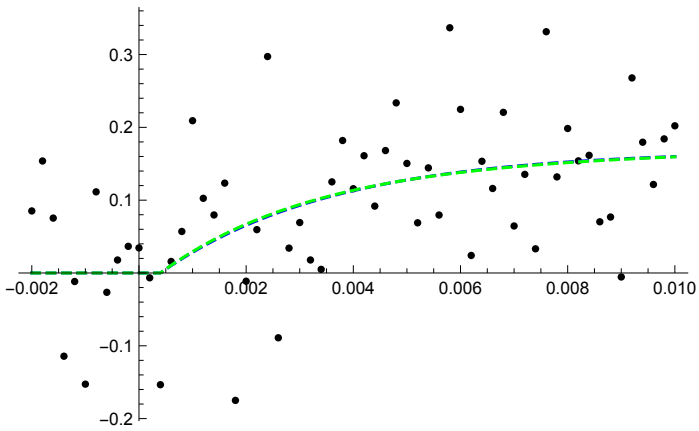


```
Mono: chi2 = 0.524406     d = 0.524406     a = 0.168609     t = 0.00324455
Bi: ratio chi2Mono/chi2Bi = 0.999643     d = 0.0004     a =
 0.790883     a1 = 0.154144     t1 =0.00290988     t2 = 0.549533
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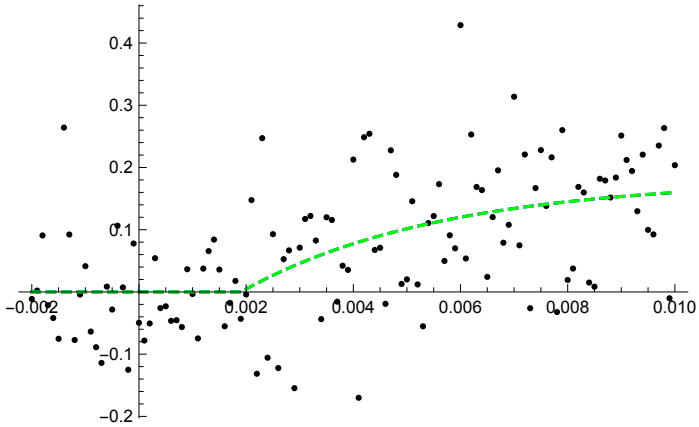


```
Mono: chi2 = 1.07177     d = 1.07177     a = 0.180349     t = 0.00374103
Bi: ratio chi2Mono/chi2Bi = 0.999984     d = 0.0019     a =
 0.578437     a1 = 0.173769     t1 =0.0036382     t2 = 0.660262
Long trace was used for fitting.
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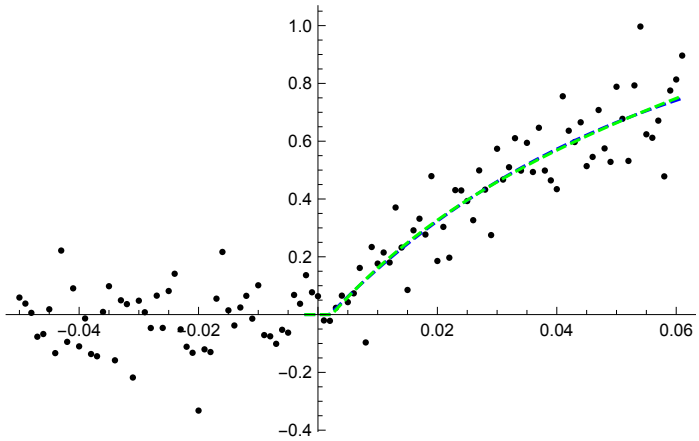


```
Mono: chi2 = 1.22378     d = 0.002     a = 1.09691     t = 0.0514711

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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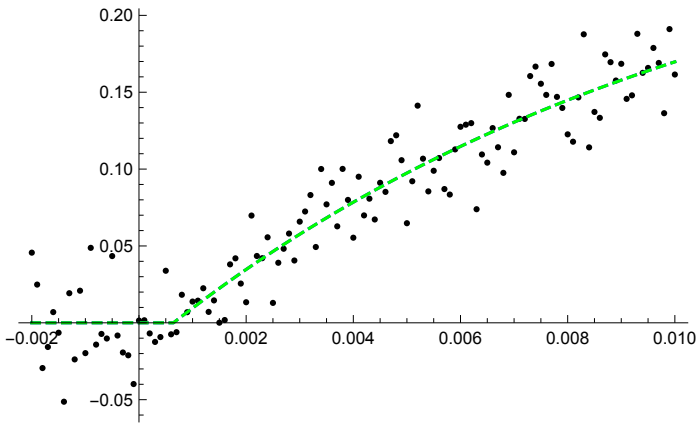


```
Mono: chi2 = 0.048316     d = 0.048316     a = 0.290897     t = 0.01068
Bi: ratio chi2Mono/chi2Bi = 0.999992     d = 0.000642593     a =
 0.422533     a1 = 0.292958     t1 =0.0107283     t2 = -1.65457
Long trace was used for fitting.
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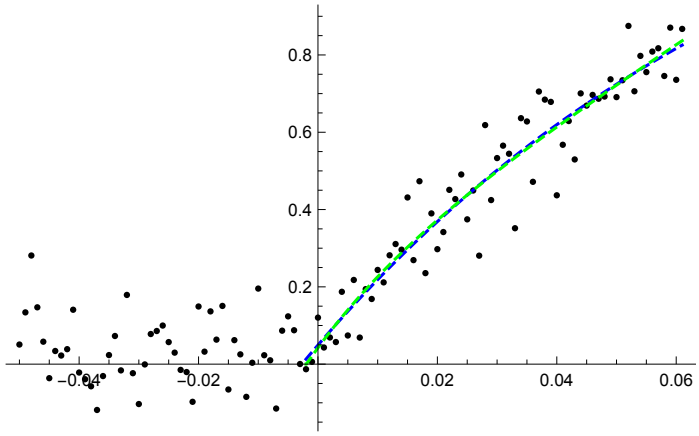


```
Mono: chi2 = 0.772724     d = -0.00269786     a = 1.53859     t = 0.0828353
Bi: ratio chi2Mono/chi2Bi = 1.00316     d = -0.00194546
      a = 33.0011     a1 = 0.203415     t1 =0.016693     t2 = 3.20379
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----------------     Ca = 1.05883
  uM   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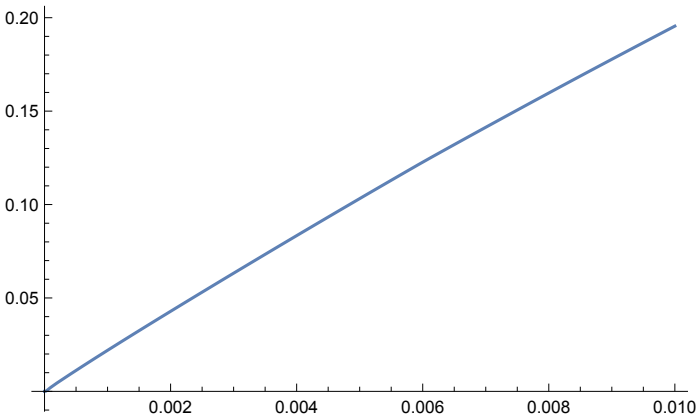

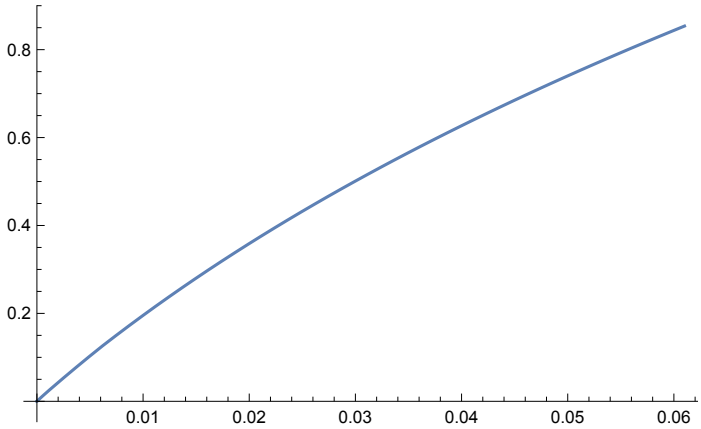

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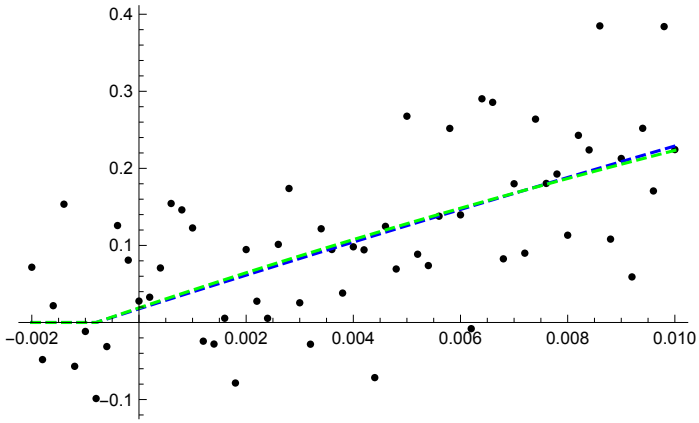


```
Mono: chi2 = 0.429954     d = 0.429954     a = 2.62049     t = 0.118093
Bi: ratio chi2Mono/chi2Bi = 0.992975     d = -0.0008
      a = 1.55778     a1 = 0.4976     t1 =0.0275055     t2 = 0.17998
Long trace was used for fitting.
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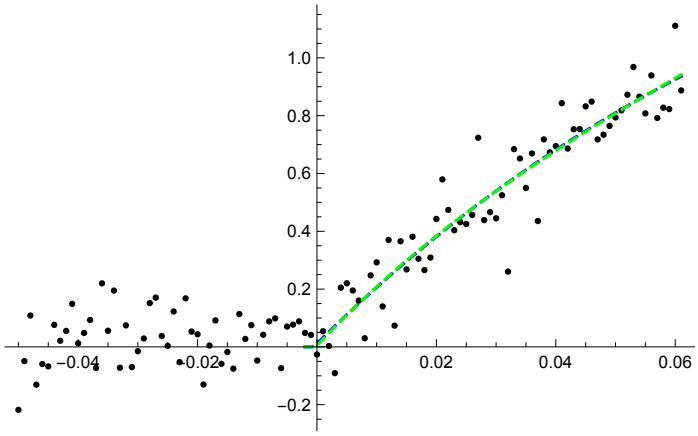


```
Mono: chi2 = 1.02573     d = -0.000553567     a = 1.97309     t = 0.0956434
Bi: ratio chi2Mono/chi2Bi = 1.00031     d = -0.000245355     a =
 0.334723     a1 = 0.815467     t1 =0.045932     t2 = -0.114135
------------------------------------------------------------------------- C10
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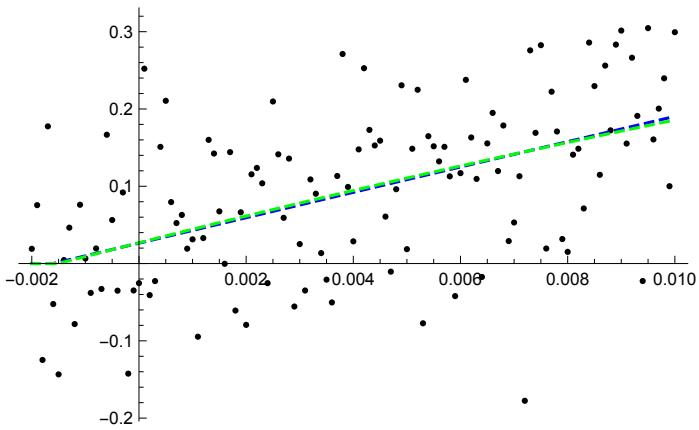

```
Mono: chi2 = 1.07892     d = 1.07892     a = 16.4583     t = 0.997085
Bi: ratio chi2Mono/chi2Bi = 0.998862     d = -0.0015     a =
 1.10058     a1 = 0.883337     t1 =0.0477342     t2 = -0.752624
Long trace was used for fitting.
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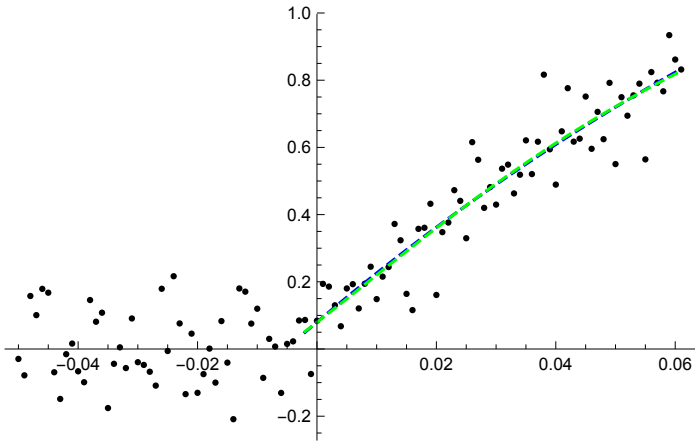


```
Mono: chi2 = 1.01047     d = -0.00520332     a = 2.29546     t = 0.146725
Bi: ratio chi2Mono/chi2Bi = 1.00294     d = -0.006     a =
 1.50134     a1 = -0.188442     t1 =0.0181598     t2 = 0.0734892
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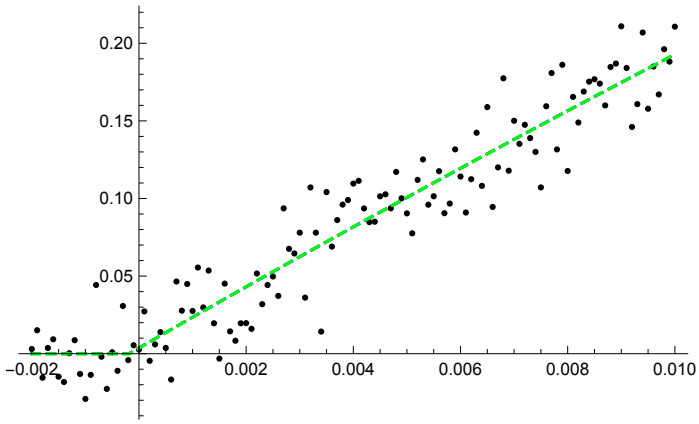

Mono: chi2 = 0.0484365 d = 0.0484365 a = 1.94523 t = 0.0976007

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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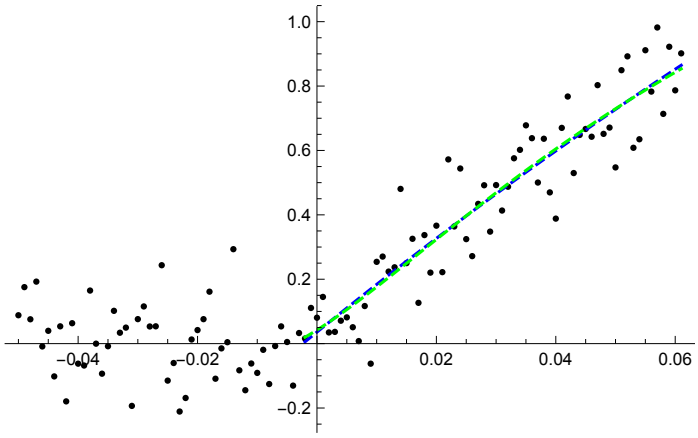


```
Mono: chi2 = 1.28806     d = -0.00237674     a = 4.4367     t = 0.292426
Bi: ratio chi2Mono/chi2Bi = 1.00263     d = -0.004     a =
 1.85754     a1 = -0.154668     t1 =0.0126676     t2 = 0.0936263
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----------------     Ca = 1.10833
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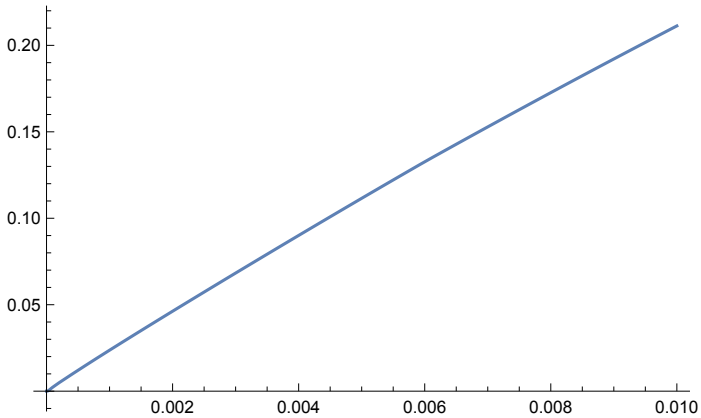

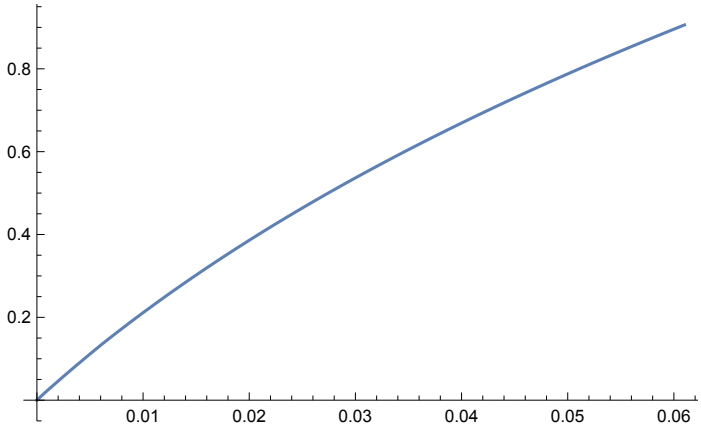


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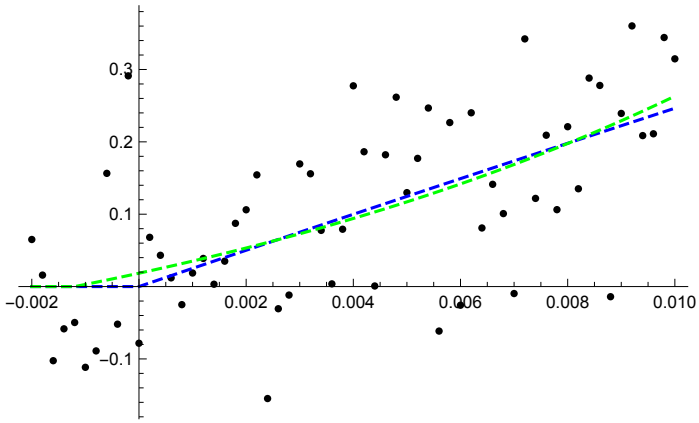


```
Mono: chi2 = 0.628845     d = 0.628845     a = 5.65335     t = 0.224383
Bi: ratio chi2Mono/chi2Bi = 1.01406     d = -0.0012     a =
 -0.0285487     a1 = 0.156116     t1 =1.84414     t2 = -0.012675
Long trace was used for fitting.
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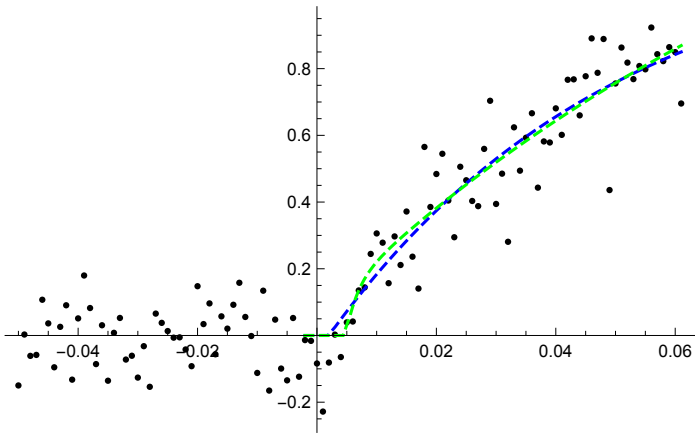


```
Mono: chi2 = 1.10215     d = 0.00200398     a = 1.20871     t = 0.048568
Bi: ratio chi2Mono/chi2Bi = 1.02445     d = 0.00479774     a =
 1.86096     a1 = 0.145693     t1 =0.00194827     t2 = 0.102616
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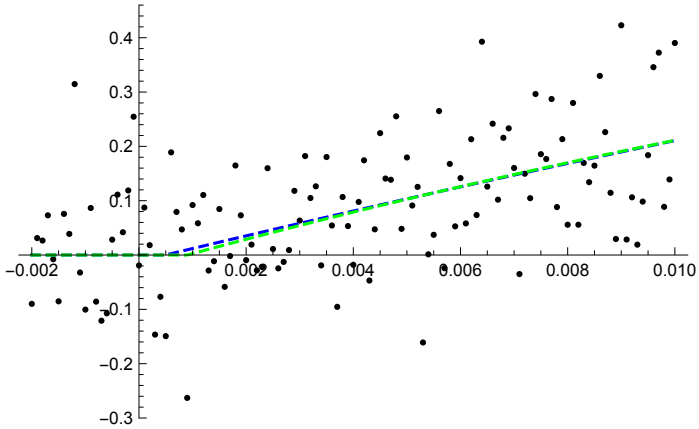


```
Mono: chi2 = 1.35981     d = 1.35981     a = 1.68493     t = 0.071194
Bi: ratio chi2Mono/chi2Bi = 0.999665     d = 0.0009     a =
 1.3353     a1 = 0.762449     t1 =0.0297084     t2 = 0.51906
Long trace was used for fitting.
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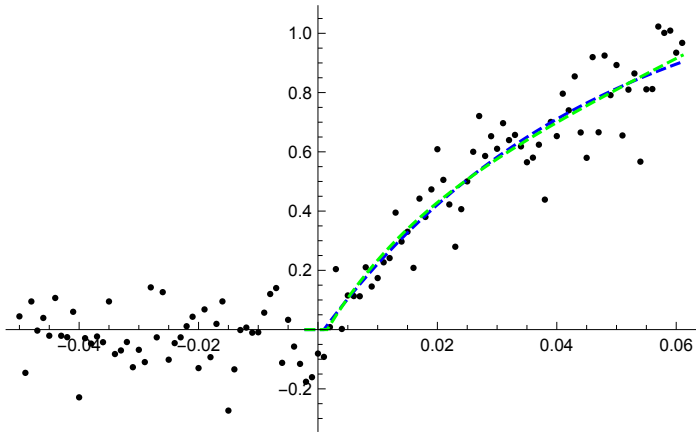


```
Mono: chi2 = 1.08452     d = 0.001     a = 1.23031     t = 0.0452769

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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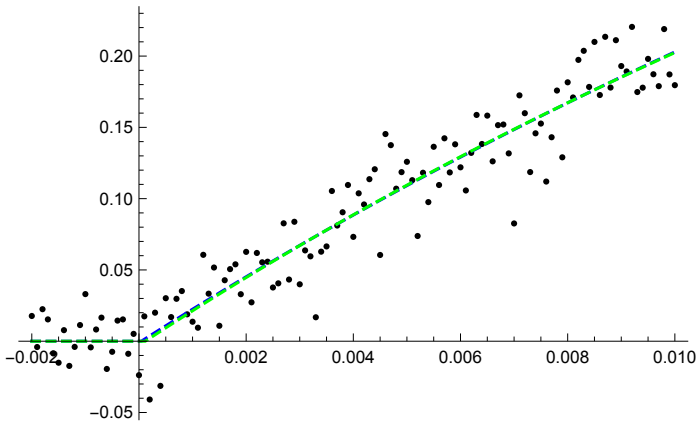


```
Mono: chi2 = 0.0509974     d = 0.0509974     a = 0.736322     t = 0.0308873
Bi: ratio chi2Mono/chi2Bi = 0.999703     d = 0.000116519
      a = 2.95316     a1 = 0.39147     t1 =0.020138     t2 = 0.495242
Long trace was used for fitting.
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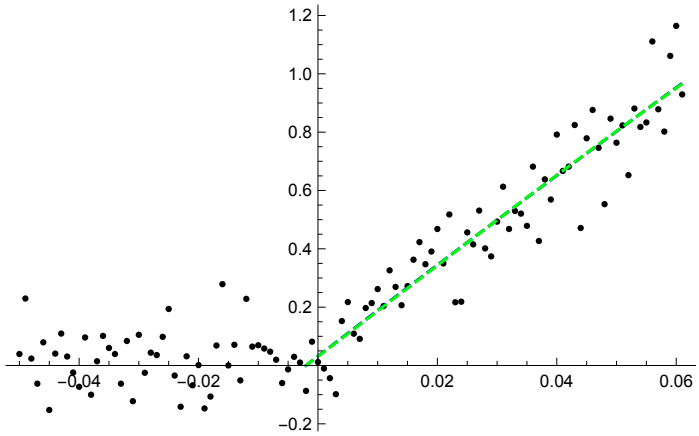


```
Mono: chi2 = 1.1049     d = -0.002     a = 16.5437     t = 1.04556
Bi: ratio chi2Mono/chi2Bi = 0.997734     d = -0.002     a =
 4.17942     a1 = -0.761362     t1 =0.0678304     t2 = 0.184965
--------------------------------------------------------------------------------------------
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----------------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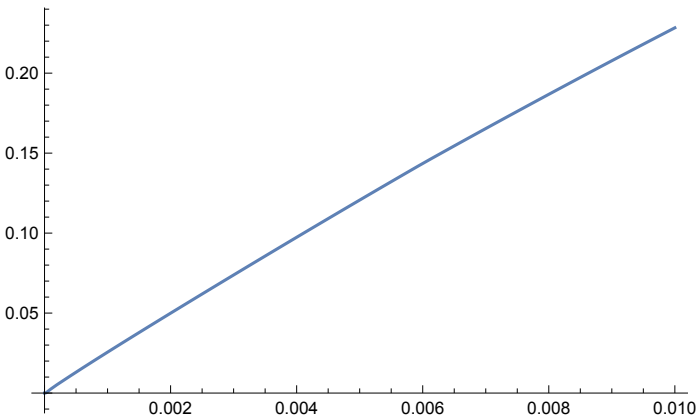

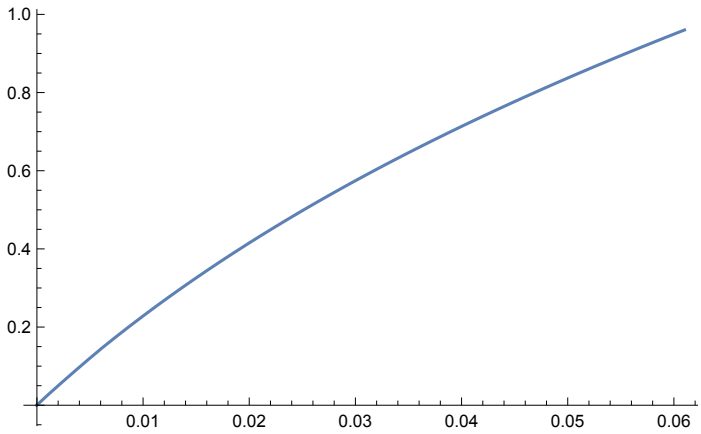

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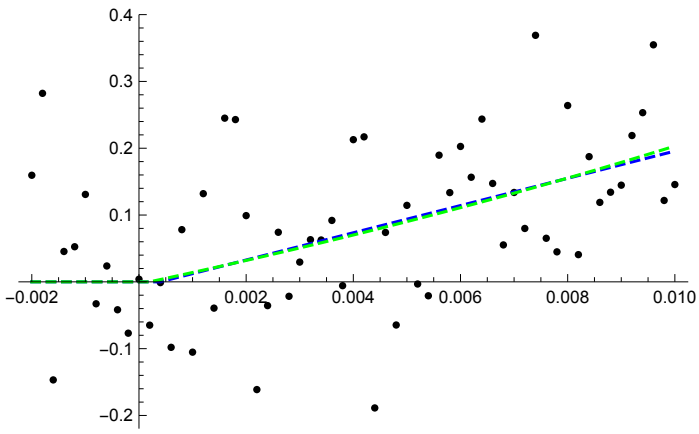

Mono: chi2 = 0.709696 d = 0.709696 a = 1.191×10^{7} t = 584 353.

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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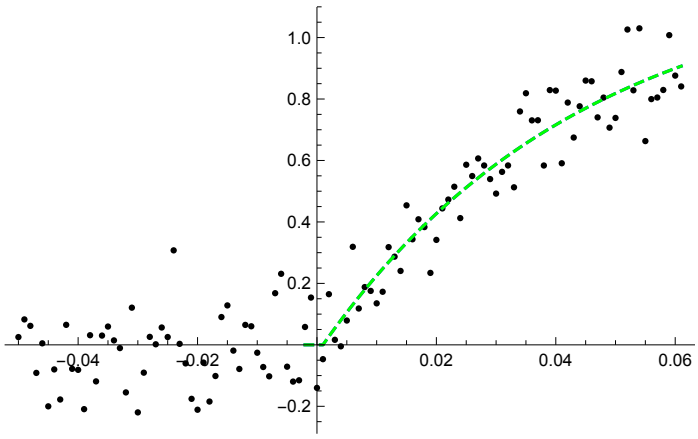


```
Mono: chi2 = 1.19345     d = 0.001     a = 1.21926     t = 0.0440661
Bi: ratio chi2Mono/chi2Bi = 0.999965     d = 0.001     a =
 1.22241     a1 = 0.531061     t1 =0.0410307     t2 = 0.0469192
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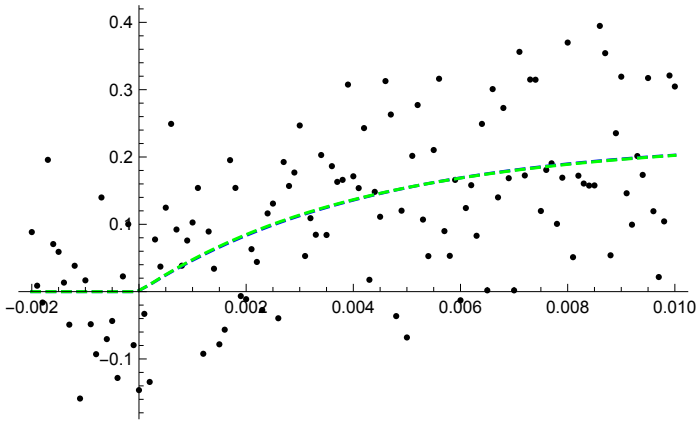

Mono: chi2 = 1.19913 d = 1.19913 a = 0.224757 t = 0.00430495

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

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

Long trace was used for fitting.

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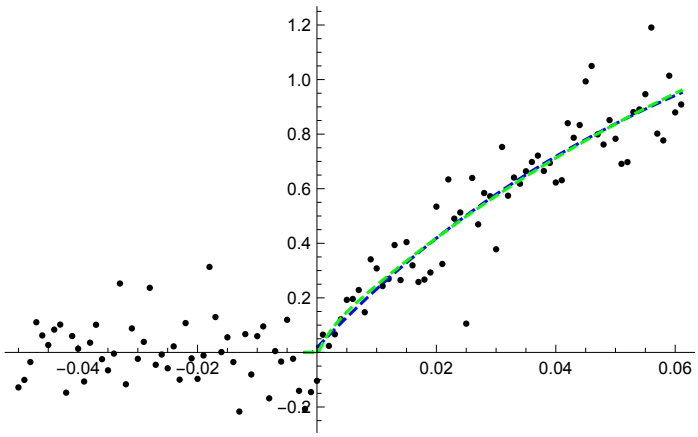


```
Mono: chi2 = 1.36532     d = -0.000740314     a = 1.60099     t = 0.0684417
Bi: ratio chi2Mono/chi2Bi = 1.00589     d = 0.00023423     a =
 1.94153     a1 = 0.0600752     t1 =0.00199959     t2 = 0.0933469
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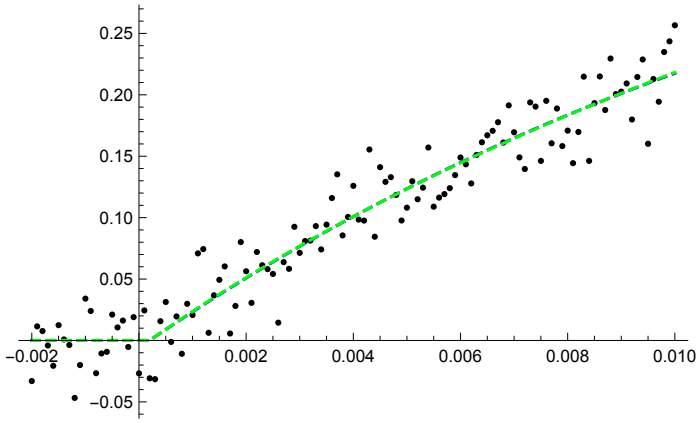


```
Mono: chi2 = 0.0558222     d = 0.0558222     a = 0.46676     t = 0.0156145
Bi: ratio chi2Mono/chi2Bi = 1.00208     d = 0.0002     a =
 -2.82789     a1 = 0.204681     t1 =0.00944052     t2 = -0.350409
Long trace was used for fitting.
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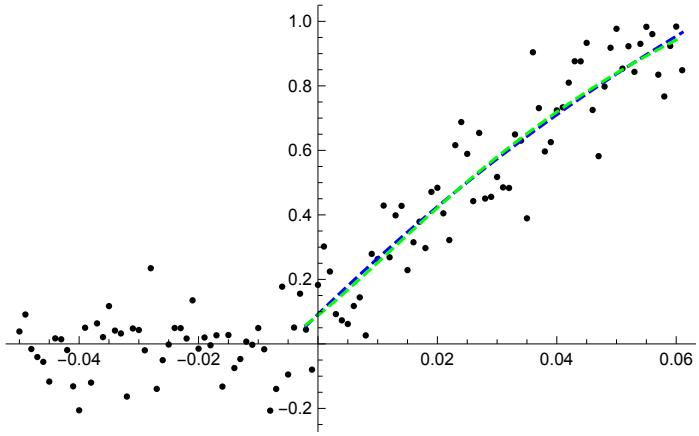

Mono: chi2 = 1.14131 d = -0.005 a = 2.38368 t = 0.127159

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

--- Ca = 1.21664

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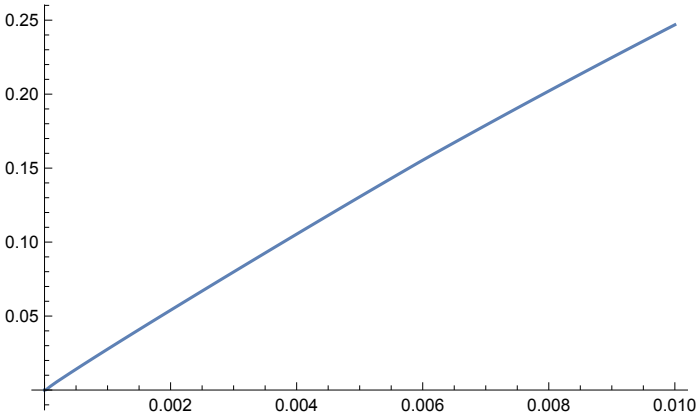

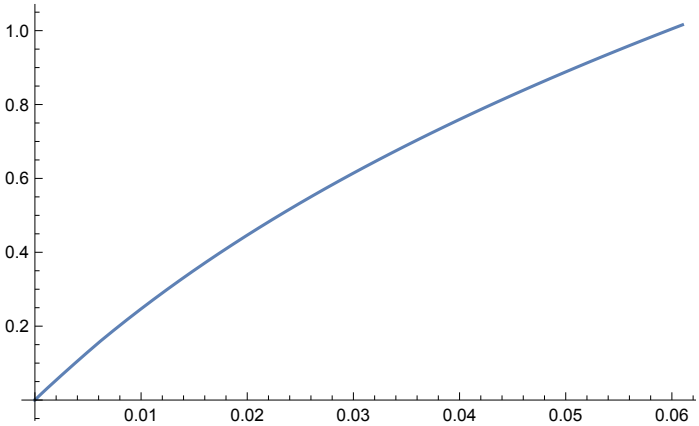

--- C5

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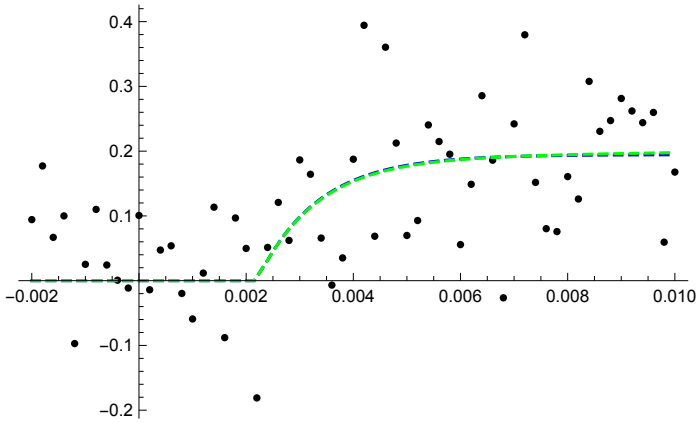


```
Mono: chi2 = 0.542771     d = 0.542771     a = 0.194605     t = 0.00113461
Bi: ratio chi2Mono/chi2Bi = 1.00065     d = 0.0022     a =
 0.745785     a1 = 0.188453     t1 =0.00110853     t2 = 0.45577
Long trace was used for fitting.
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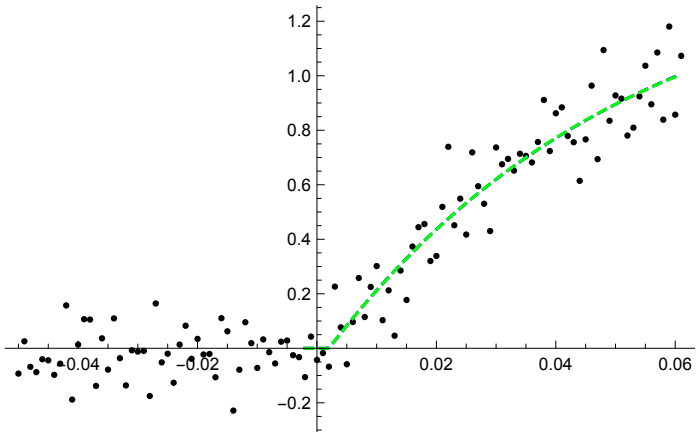


```
Mono: chi2 = 1.11344     d = 0.00202854     a = 1.46733     t = 0.0509418

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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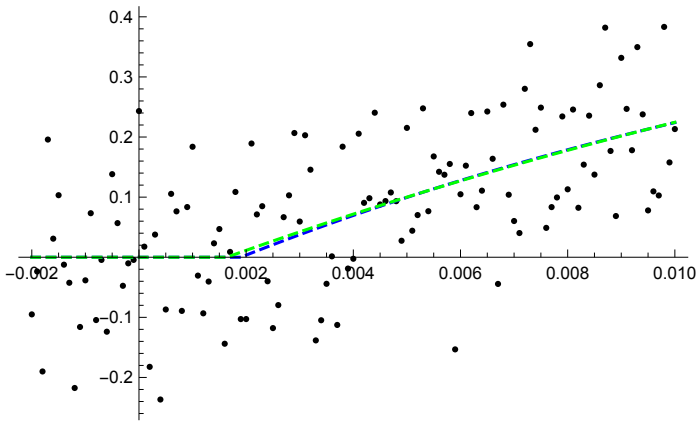


```
Mono: chi2 = 1.34497     d = 1.34497     a = 0.556665     t = 0.015738
Bi: ratio chi2Mono/chi2Bi = 0.999908     d = 0.00163826     a =
 0.915813     a1 = 0.751828     t1 =0.023469     t2 = -1.66303
Long trace was used for fitting.
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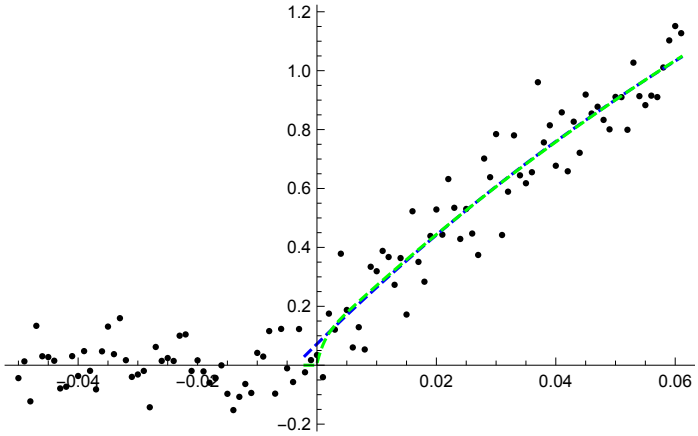


```
Mono: chi2 = 0.898322     d = -0.00357617     a = 2.69983     t = 0.131867
Bi: ratio chi2Mono/chi2Bi = 1.00747     d = -0.0000598197
      a = 3.0469     a1 = 0.0851039     t1 =0.00124249     t2 = 0.15543
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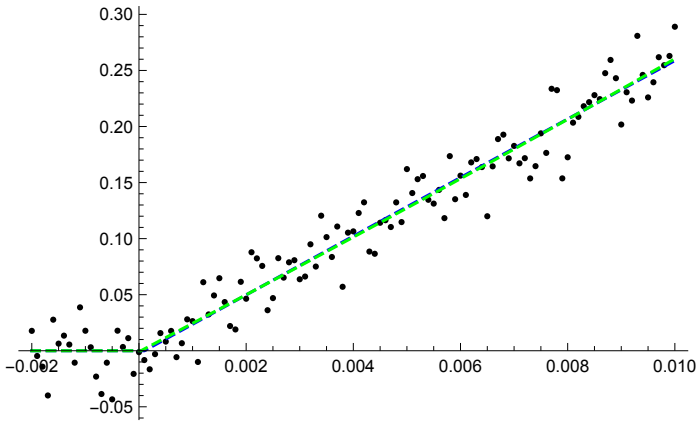


```
Mono: chi2 = 0.0477383     d = 0.0477383     a = 33.1049     t = 1.26149

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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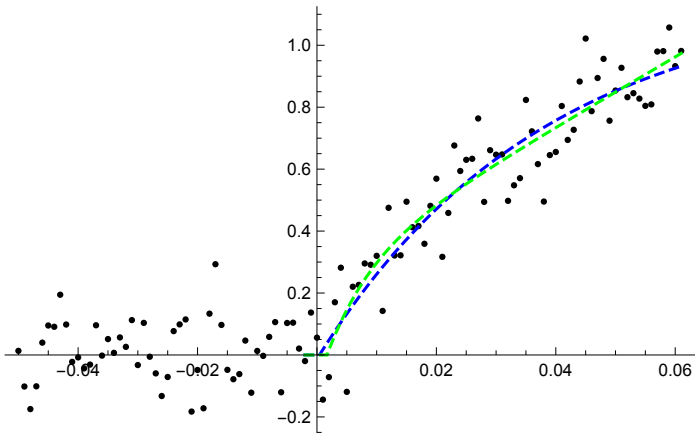


```
Mono: chi2 = 1.16271     d = 0.000423525     a = 1.16887     t = 0.0379306

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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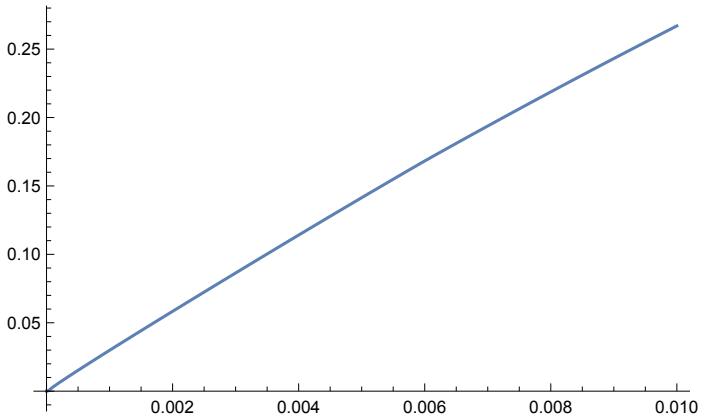
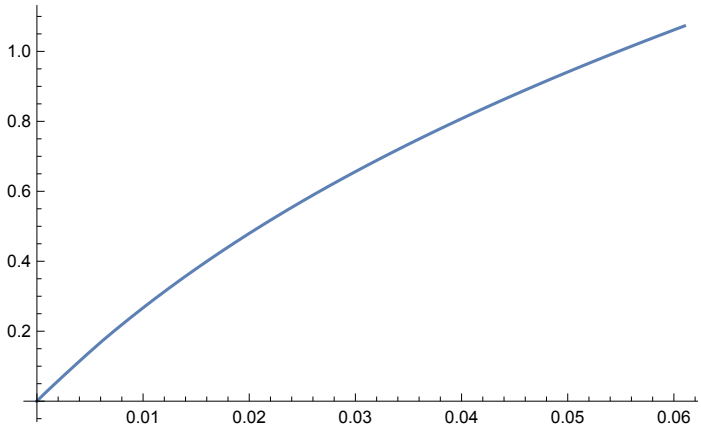
```

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

uM ----------





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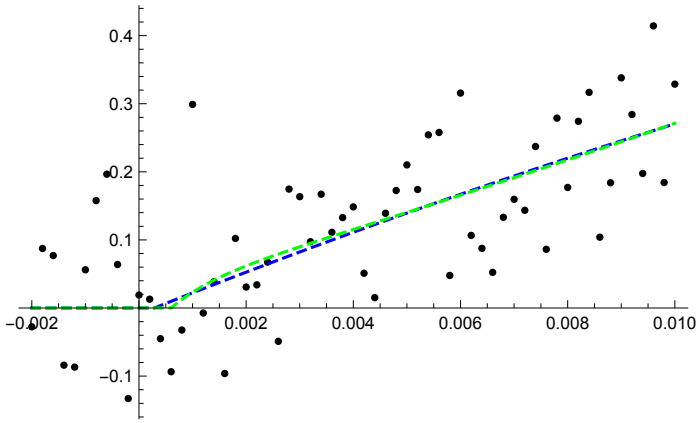


```
Mono: chi2 = 0.487875     d = 0.487875     a = 1.24898     t = 0.0398154
Bi: ratio chi2Mono/chi2Bi = 1.00718     d = 0.0006     a =
 -1.264     a1 = 0.0346729     t1 =0.000777574     t2 = -0.0561662
Long trace was used for fitting.
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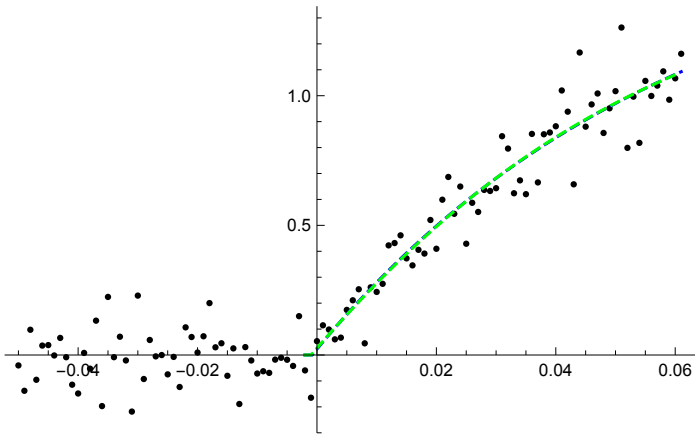


```
Mono: chi2 = 1.11547     d = -0.000818806     a = 1.7033     t = 0.0602789
Bi: ratio chi2Mono/chi2Bi = 1.00125     d = -0.001     a =
 1.5644     a1 = -0.264066     t1 =0.0218856     t2 = 0.0470575
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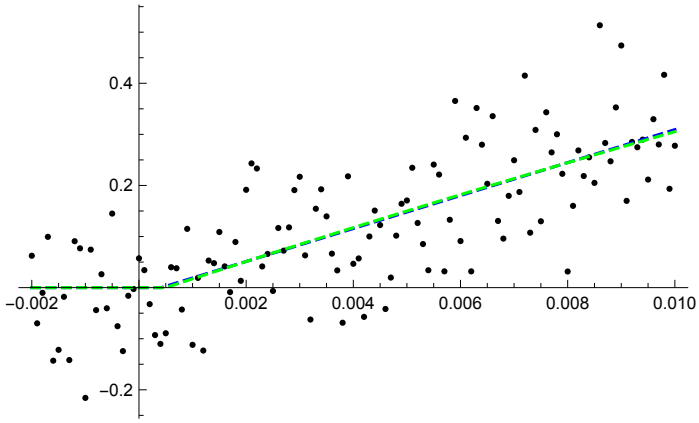

Mono: chi2 = 1.10123 d = 1.10123 a = 6.04983×10^6 t = 187 540.

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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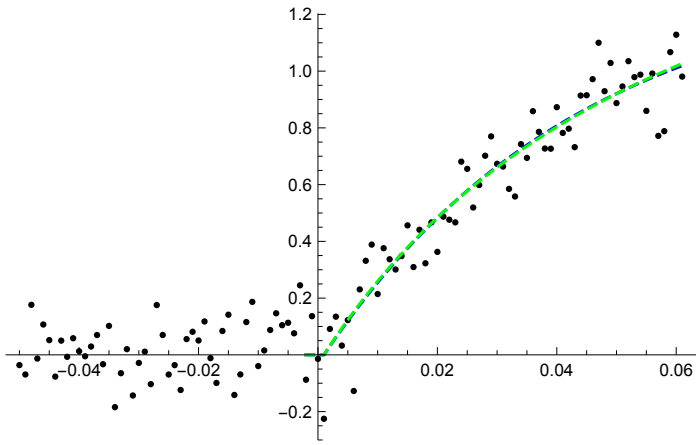


```
Mono: chi2 = 1.06794     d = 0.001     a = 1.35813     t = 0.043239
Bi: ratio chi2Mono/chi2Bi = 0.997794     d = 0.001     a =
 1.60927     a1 = 0.284875     t1 =0.0204745     t2 = 0.0708031
------------------------------------------------------------------------ D
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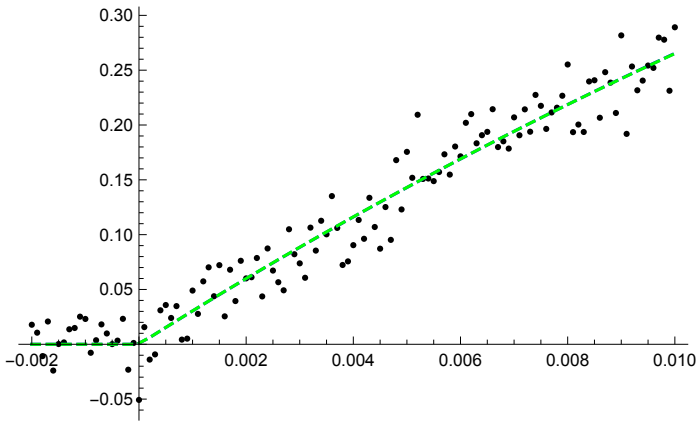

Mono: chi2 = 0.0519836 d = 0.0519836 a = 0.991062 t = 0.0320921

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

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

Long trace was used for fitting.

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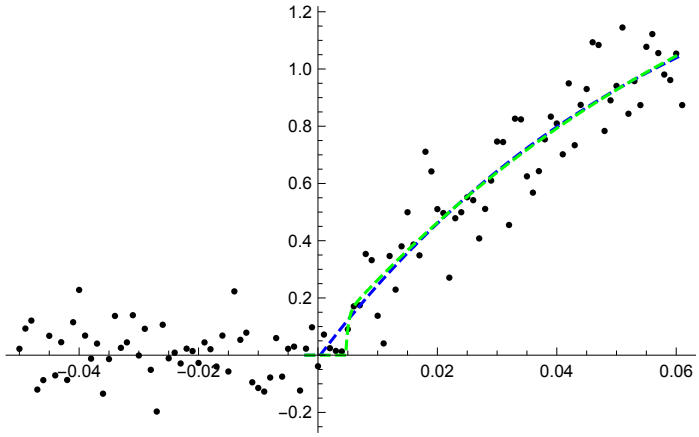


```
Mono: chi2 = 1.21109     d = 0.000364877     a = 1.64885     t = 0.0599608
Bi: ratio chi2Mono/chi2Bi = 1.01047     d = 0.00465463     a =
 1.88424     a1 = 0.144696     t1 =0.000408018     t2 = 0.0758611
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  -------------------------
----------------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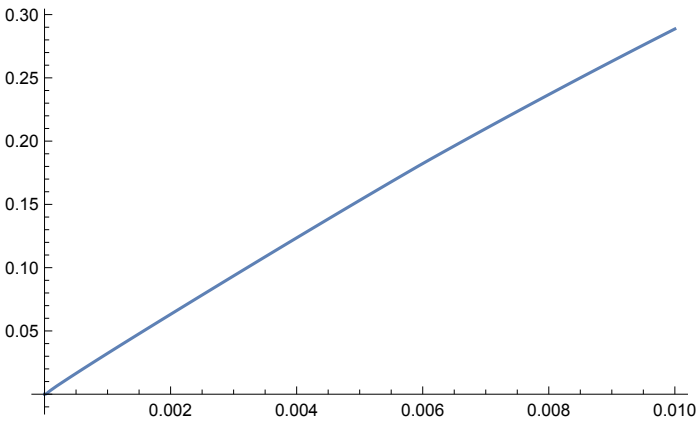

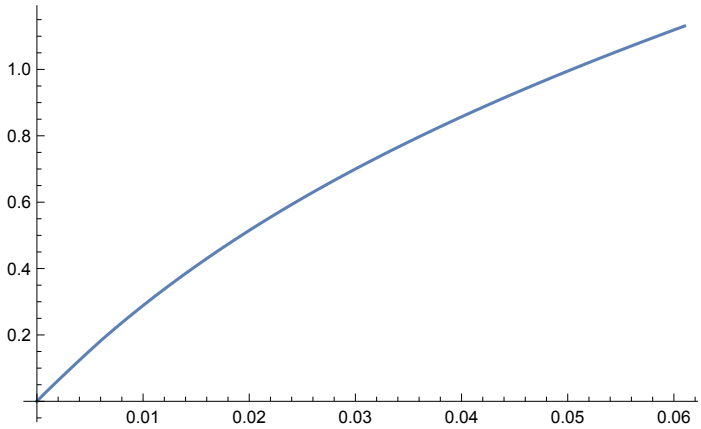

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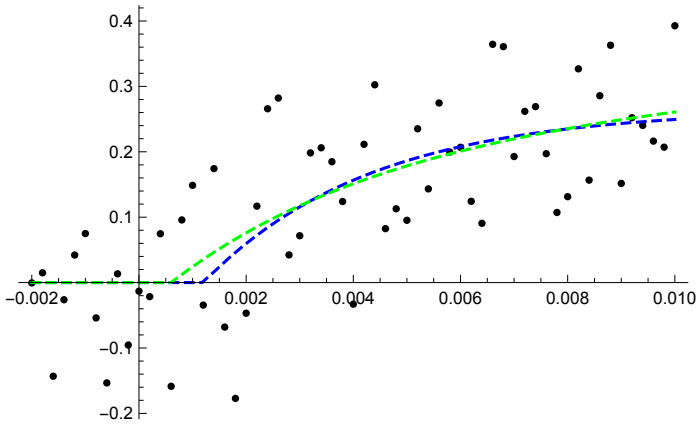


```
Mono: chi2 = 0.559972     d = 0.559972     a = 0.265551     t = 0.00314372
Bi: ratio chi2Mono/chi2Bi = 1.00647     d = 0.0006     a =
 1.32602     a1 = 0.225117     t1 =0.00392681     t2 = 0.178921
Long trace was used for fitting.
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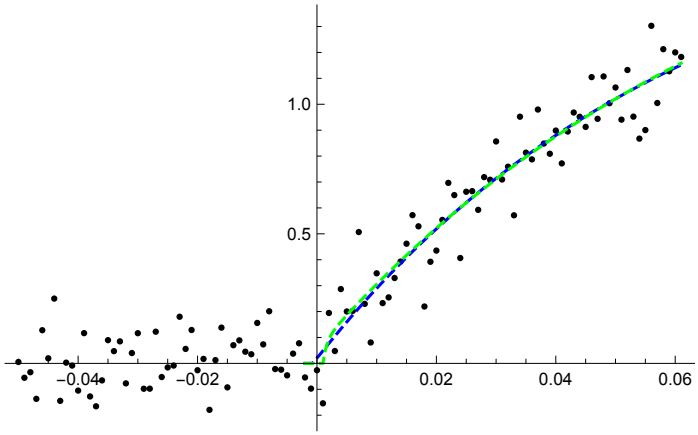


```
Mono: chi2 = 1.23668     d = -0.000668501     a = 1.82127     t = 0.0616179
Bi: ratio chi2Mono/chi2Bi = 1.02249     d = 0.001     a =
 2.02061     a1 = 0.0840325     t1 =0.000644981     t2 = 0.0741379
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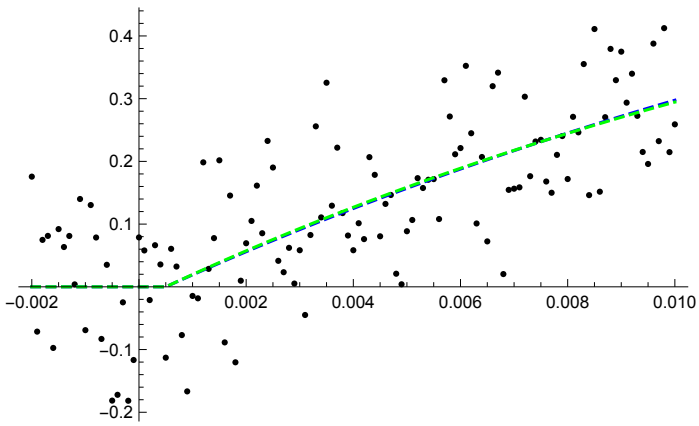

```
Mono: chi2 = 1.00421     d = 1.00421     a = 0.841813     t = 0.0217869
Bi: ratio chi2Mono/chi2Bi = 0.99973     d = 0.0005     a =
 1.13919     a1 = 0.748919     t1 =0.0184882     t2 = -0.585288
Long trace was used for fitting.
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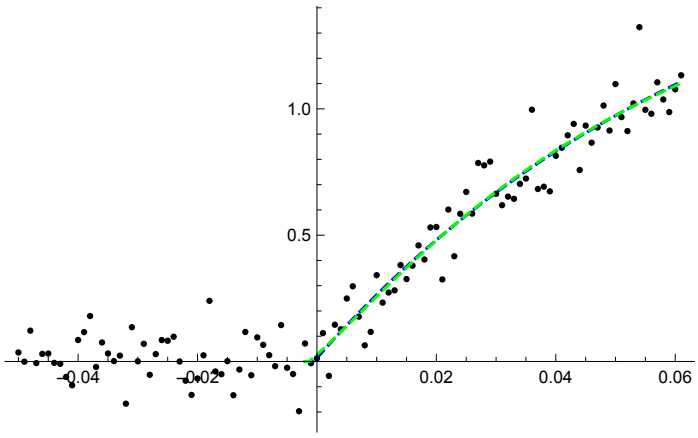


```
Mono: chi2 = 0.902312     d = -0.000527111     a = 1.901     t = 0.0704314
Bi: ratio chi2Mono/chi2Bi = 1.00153     d = -0.00133401     a =
 1.72615     a1 = -0.0661298     t1 =0.00625883     t2 = 0.0591337
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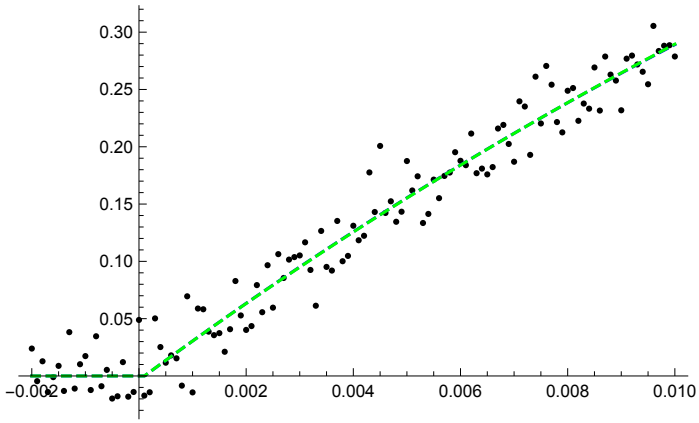


```
Mono: chi2 = 0.0499223     d = 0.0499223     a = 0.995895     t = 0.0288575
Bi: ratio chi2Mono/chi2Bi = 0.999934     d = 0.0001     a =
 1.62792     a1 = 0.976751     t1 =0.0291269     t2 = 0.793295
Long trace was used for fitting.
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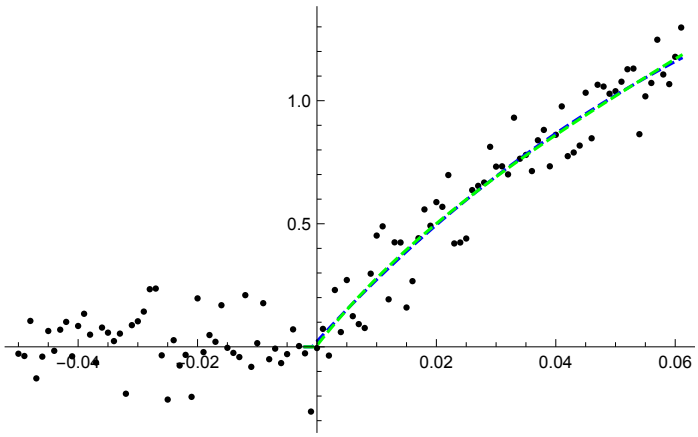


```
Mono: chi2 = 1.25968     d = -0.000818651     a = 2.23002     t = 0.082895
Bi: ratio chi2Mono/chi2Bi = 1.00212     d = -0.000177475
      a = 46.4095     a1 = 0.339945     t1 =0.0201656     t2 = 3.2435
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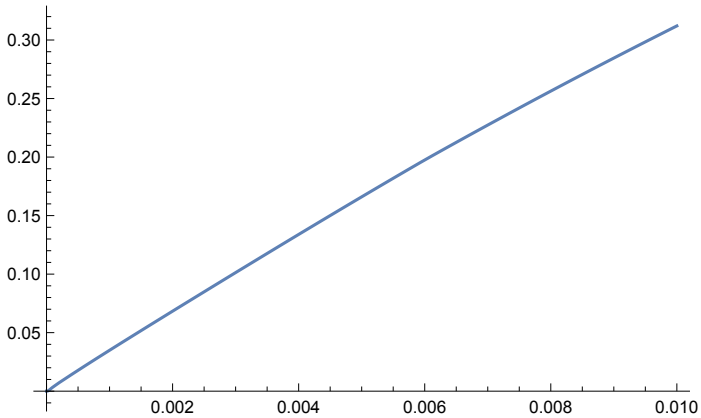
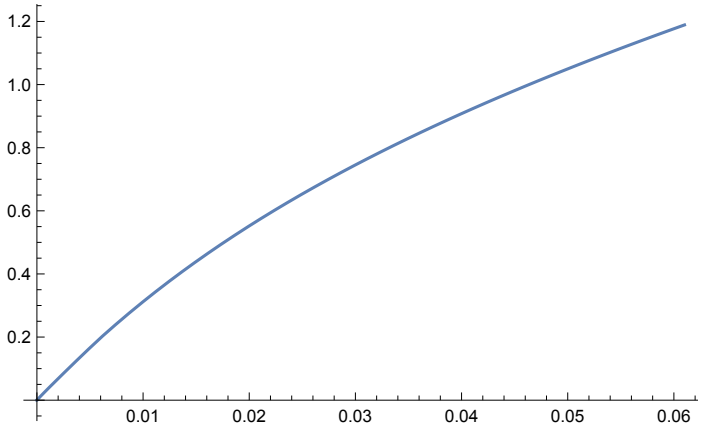
---------- Ca = 1.40597
uM ----------





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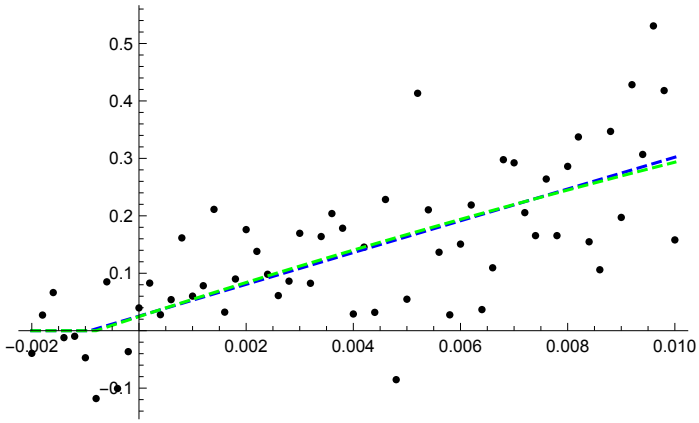

Mono: chi2 = 0.538359 d = 0.538359 a = 5.36727×10^6 t = 193 998.

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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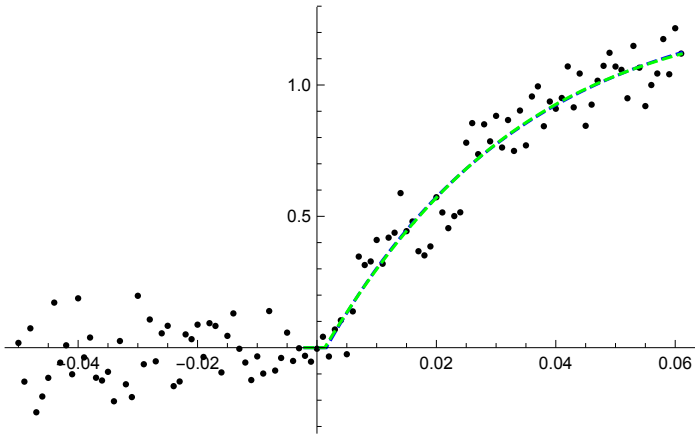


```
Mono: chi2 = 1.067     d = 0.0015558     a = 1.35045     t = 0.0333863
Bi: ratio chi2Mono/chi2Bi = 1.00071     d = 0.0013004     a =
 1.28436     a1 = -4.65478     t1 =0.0209599     t2 = 0.0228581
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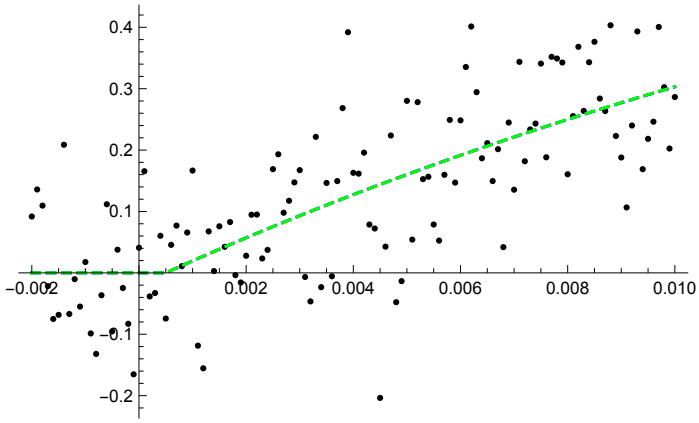


```
Mono: chi2 = 1.16066     d = 1.16066     a = 0.847512     t = 0.0214746
Bi: ratio chi2Mono/chi2Bi = 0.999999     d = 0.0005     a =
 1.23253     a1 = 0.823691     t1 =0.021383     t2 = 0.488398
Long trace was used for fitting.
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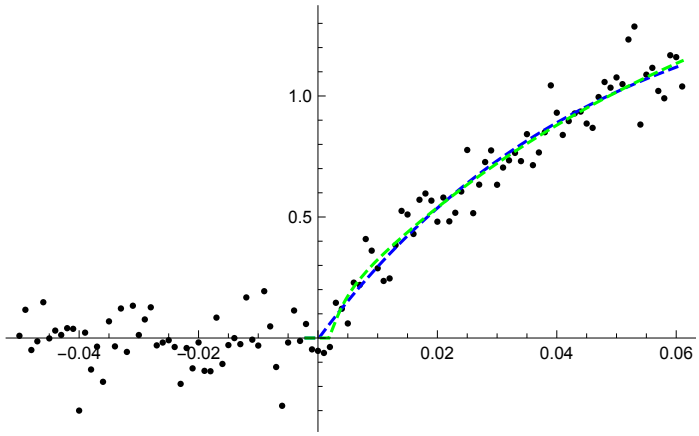


```
Mono: chi2 = 1.00059     d = 0.00016406     a = 1.54563     t = 0.0464766

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

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

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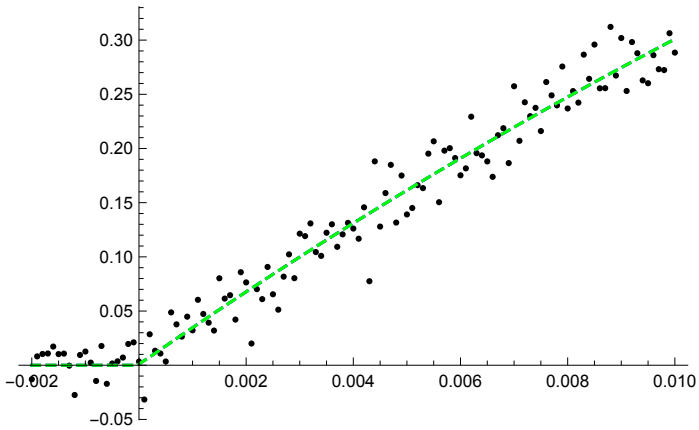


```
Mono: chi2 = 0.0452043     d = 0.0452043     a = 1.21676     t = 0.0352614
Bi: ratio chi2Mono/chi2Bi = 1.00007     d = -0.0000186784
      a = 0.905932     a1 = 1.58901     t1 =0.0394158     t2 = 0.117666
Long trace was used for fitting.
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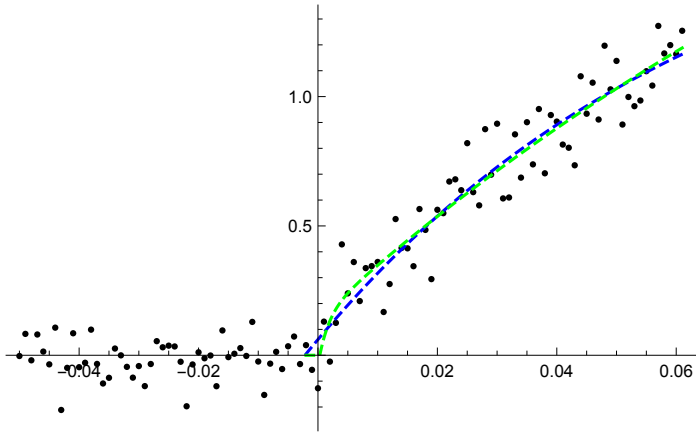


```
Mono: chi2 = 1.02585     d = -0.00217442     a = 1.89952     t = 0.0666196
Bi: ratio chi2Mono/chi2Bi = 1.04379     d = 0.000307541     a =
 3.18813     a1 = 0.152597     t1 =0.00165913     t2 = 0.145469
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----------------     Ca = 1.47745
  uM  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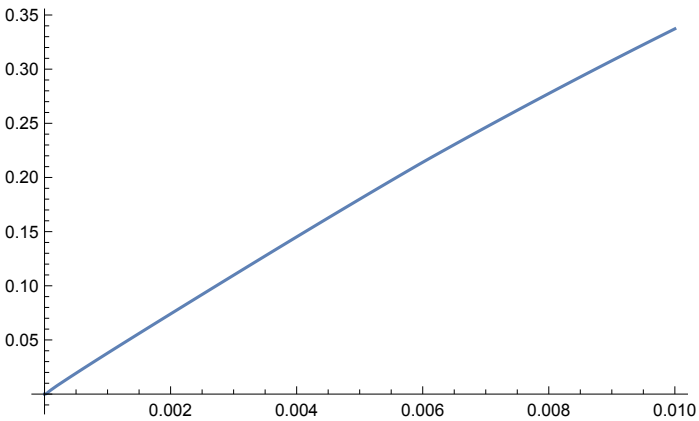

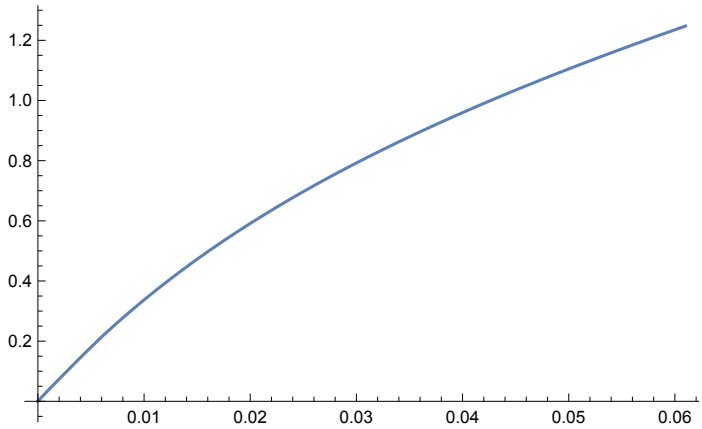

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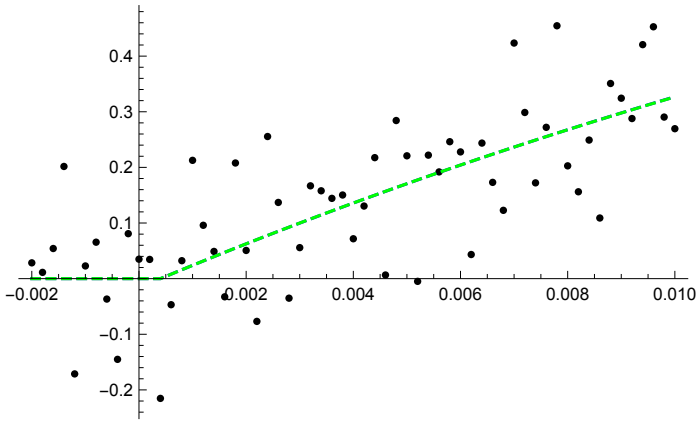


```
Mono: chi2 = 0.610555     d = 0.610555     a = 1.12596     t = 0.0279931
Bi: ratio chi2Mono/chi2Bi = 0.999982     d = 0.0004     a =
 1.56124     a1 = 1.16348     t1 =0.0283074     t2 = -0.484444
Long trace was used for fitting.
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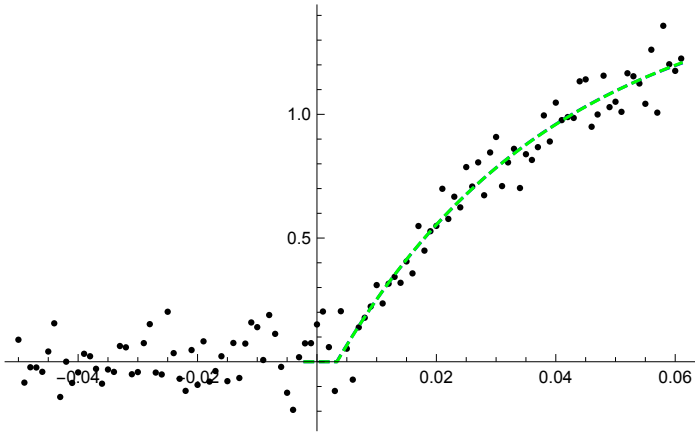


```
Mono: chi2 = 0.835853     d = 0.00331756     a = 1.52985     t = 0.0371399
Bi: ratio chi2Mono/chi2Bi = 1.00004     d = 0.00335859
      a = 3.56994     a1 = 1.38718     t1 =0.0345564     t2 = 1.50258
------------------------------------------------------------------------- C10
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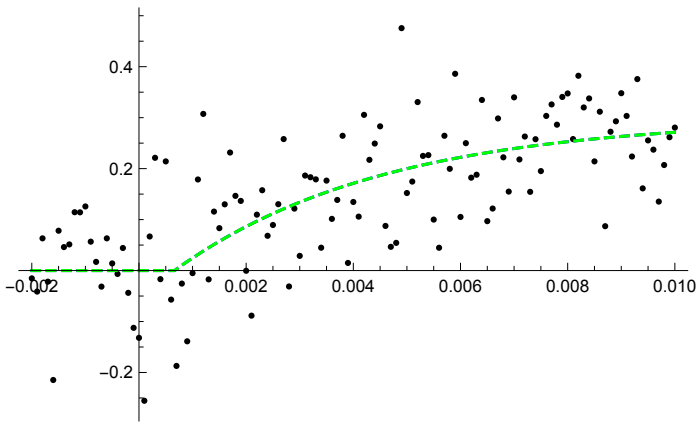

```
Mono: chi2 = 1.16955     d = 1.16955     a = 0.298898     t = 0.00392465
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000662842     a =
 0.322134     a1 = 0.298204     t1 =0.00391647     t2 = 0.450343
Long trace was used for fitting.
take bi
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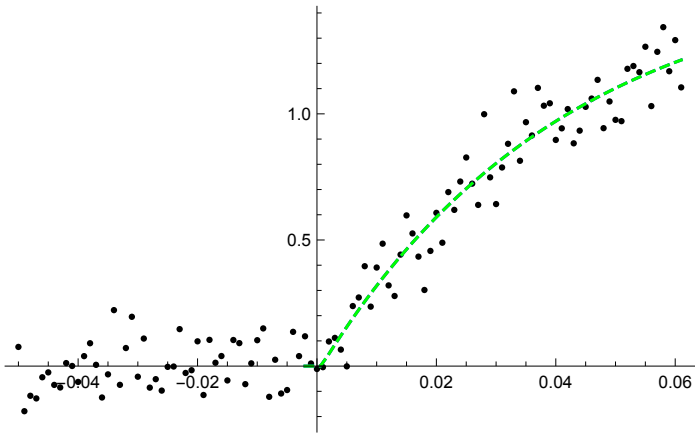


```
Mono: chi2 = 1.05644     d = 0.000721249     a = 1.57757     t = 0.041114
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000721249     a =
 1.57757     a1 = 0.0618478     t1 =0.0411141     t2 = 0.041114
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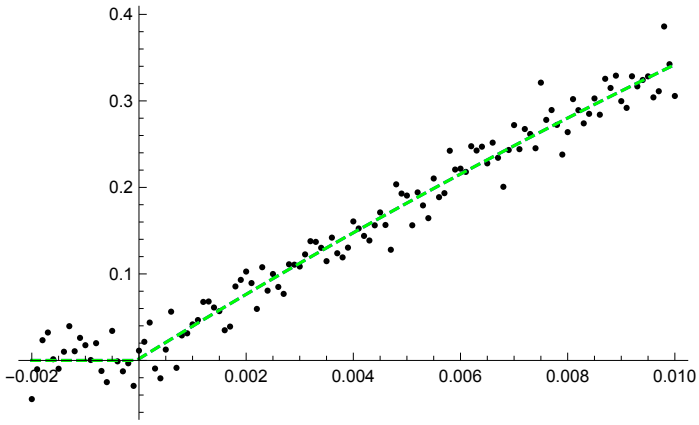


```
Mono: chi2 = 0.0483794     d = 0.0483794     a = 1.62198     t = 0.042441

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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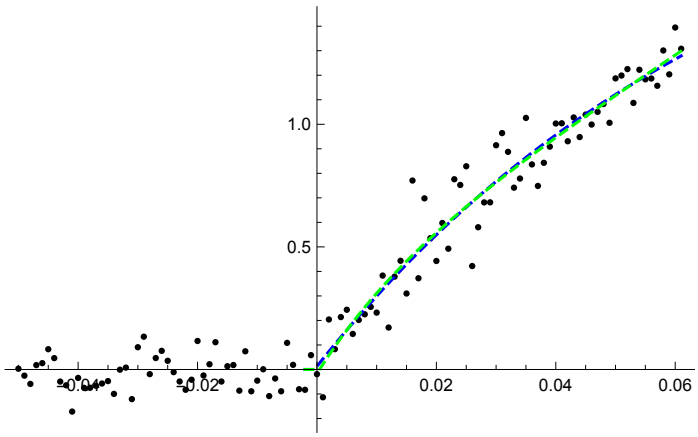


```
Mono: chi2 = 0.898551     d = -0.000417426     a = 2.24062     t = 0.0726209
Bi: ratio chi2Mono/chi2Bi = 1.00897     d = 0.000432122
      a = 70.9348     a1 = 0.335419     t1 =0.0151568     t2 = 4.38072
-------------------------------------------------------------------------------------
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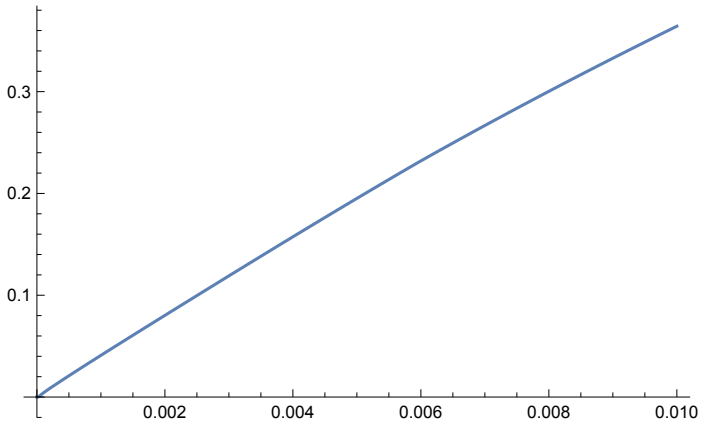
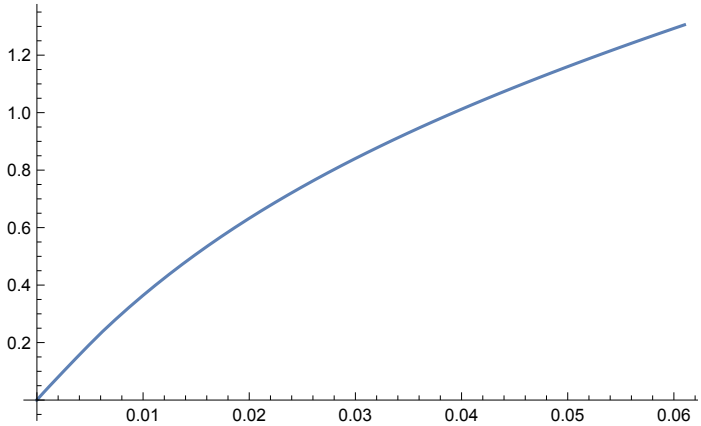
```

---------- Ca = 1.55324

uM ----------





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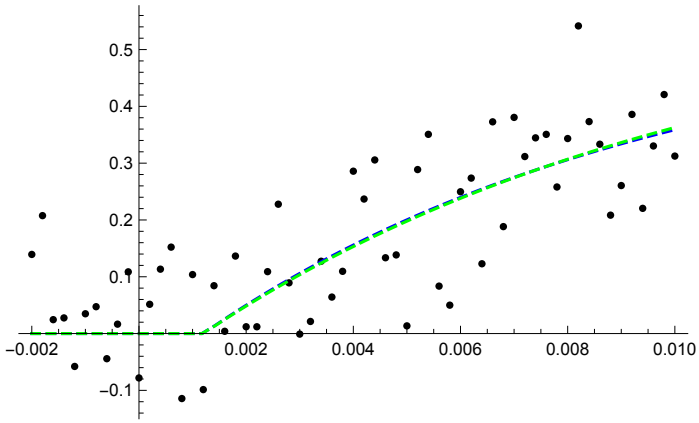


```
Mono: chi2 = 0.546979     d = 0.546979     a = 0.559526     t = 0.00858083
Bi: ratio chi2Mono/chi2Bi = 0.999954     d = 0.0012     a =
 0.908248     a1 = 0.584184     t1 =0.00935557     t2 = 0.424381
Long trace was used for fitting.
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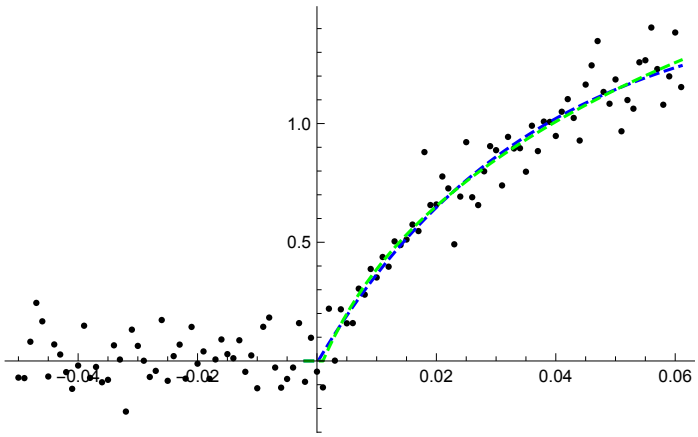


```
Mono: chi2 = 1.09024     d = 0.000200062     a = 1.52138     t = 0.0357671
Bi: ratio chi2Mono/chi2Bi = 1.01423     d = 0.001     a =
 1.94977     a1 = 0.24387     t1 =0.00774961     t2 = 0.0654728
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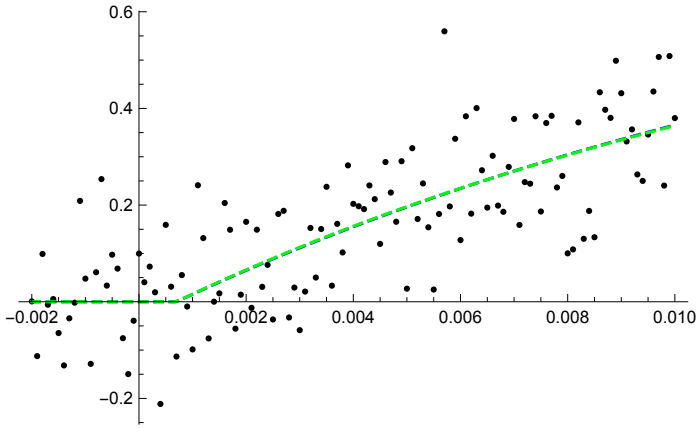


```
Mono: chi2 = 1.32758     d = 1.32758     a = 0.812436     t = 0.0155645
Bi: ratio chi2Mono/chi2Bi = 1.00008     d = 0.0007     a =
 1.58469     a1 = 0.442192     t1 =0.0108552     t2 = 0.0919492
Long trace was used for fitting.
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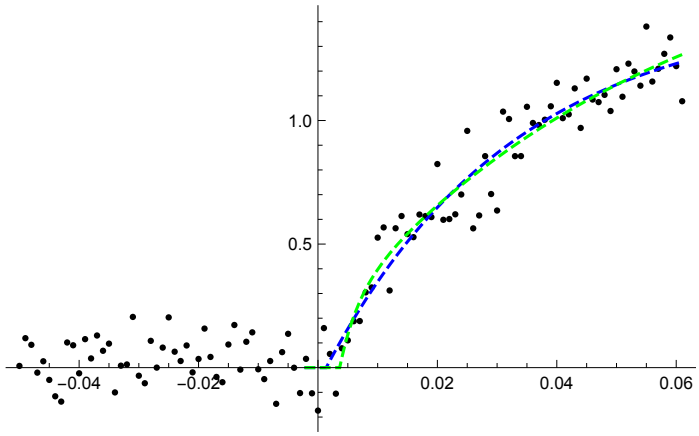


```
Mono: chi2 = 1.09315     d = 0.00138374     a = 1.46017     t = 0.031704

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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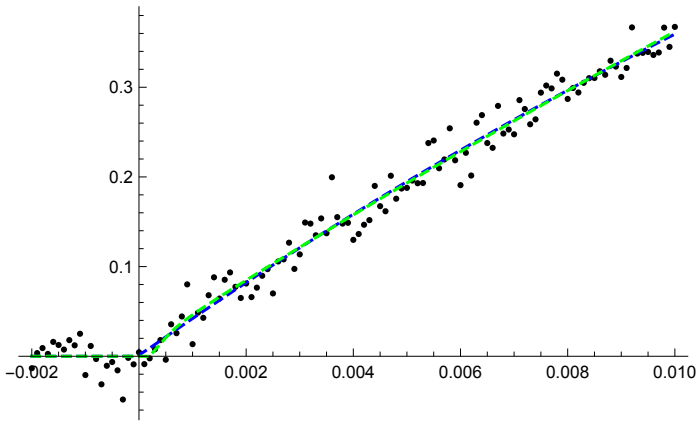


```
Mono: chi2 = 0.0352887     d = 0.0352887     a = 1.27616     t = 0.0303016
Bi: ratio chi2Mono/chi2Bi = 1.01375     d = 0.000263385     a =
 2.27657     a1 = 0.0194929     t1 =0.00025844     t2 = 0.0591351
Long trace was used for fitting.
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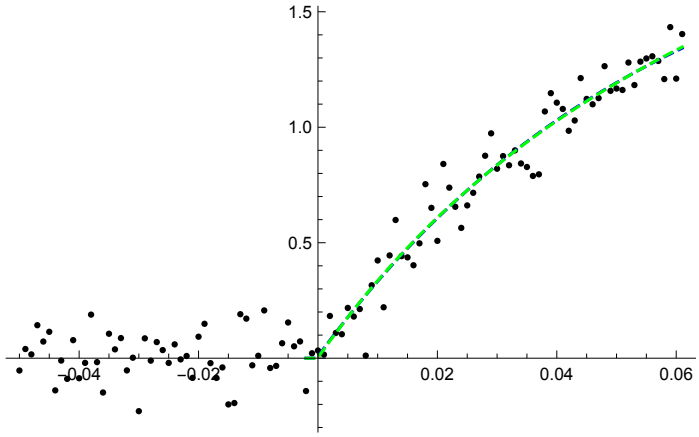


```
Mono: chi2 = 1.05224      d = -0.000220809      a = 2.05487      t = 0.0578041
Bi: ratio chi2Mono/chi2Bi = 1.00033      d = -0.0000653309
      a = 7.7106      a1 = 1.11104      t1 =0.0383168      t2 = 0.841019
-------------------------------------------------------------------------------------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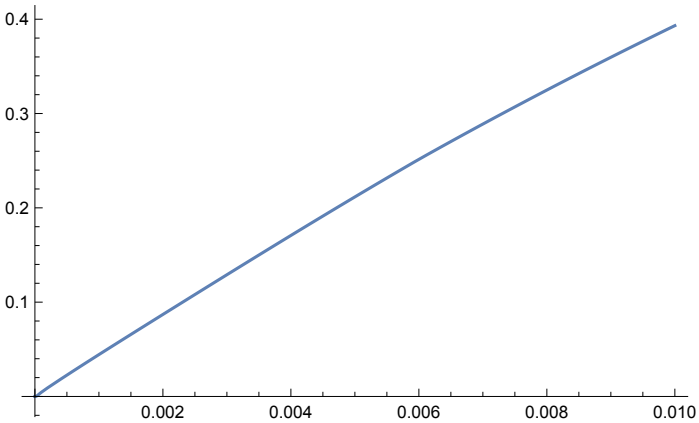

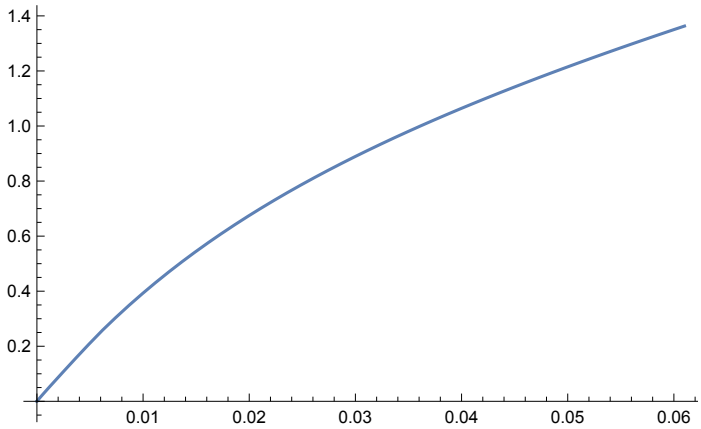

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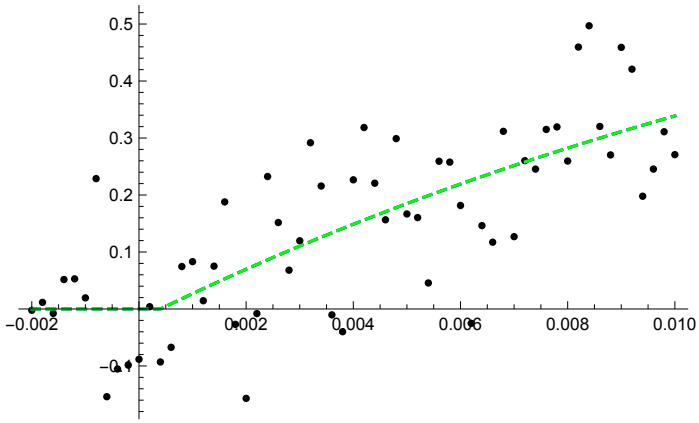


```
Mono: chi2 = 0.659215     d = 0.659215     a = 0.814402     t = 0.0178546
Bi: ratio chi2Mono/chi2Bi = 0.999991     d = 0.0004     a =
 1.37801     a1 = 0.873203     t1 =0.018569     t2 = -0.354158
Long trace was used for fitting.
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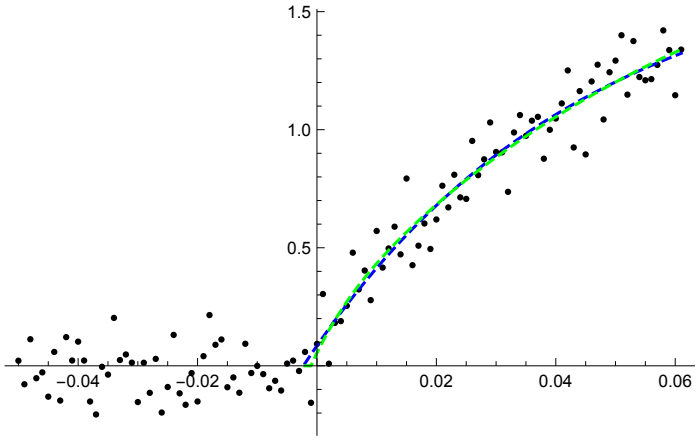


```
Mono: chi2 = 1.22396     d = -0.00226985     a = 1.77247     t = 0.0460912
Bi: ratio chi2Mono/chi2Bi = 1.01061     d = -0.001     a =
 2.12784     a1 = 0.16542     t1 =0.0058976     t2 = 0.0679577
------------------------------------------------------------------------- C10
take mono
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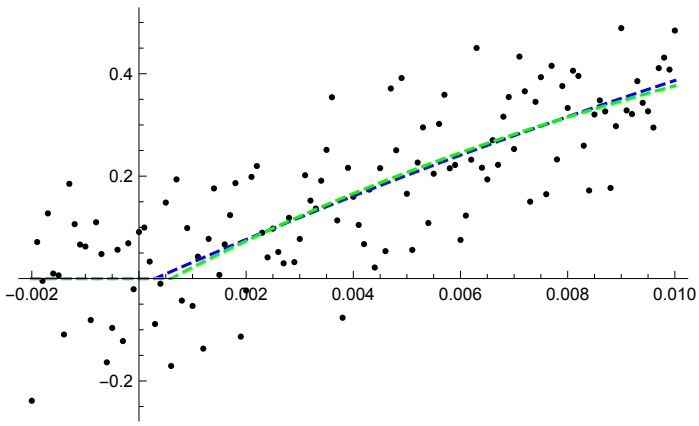

```
Mono: chi2 = 1.15552     d = 1.15552     a = 1.51536     t = 0.0329129
Bi: ratio chi2Mono/chi2Bi = 0.99764     d = 0.0006     a =
 1.51148     a1 = 0.332288     t1 =0.00884354     t2 = 0.0648732
Long trace was used for fitting.
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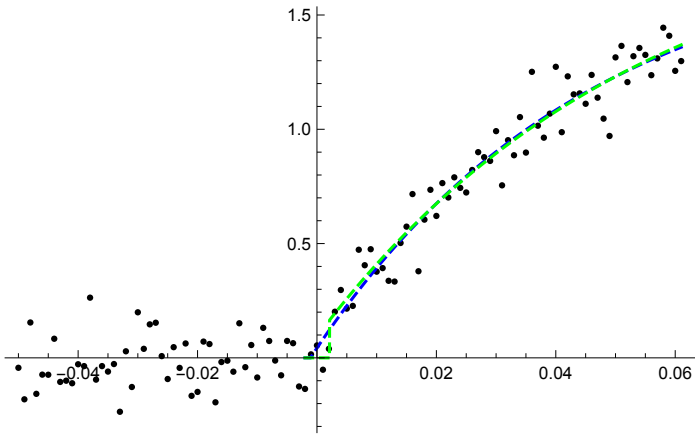

Mono: chi2 = 1.17578 d = -0.00109068 a = 1.83389 t = 0.0459536

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

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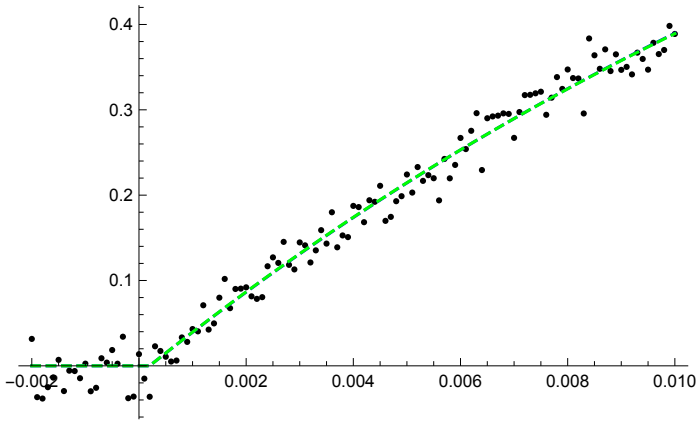


```
Mono: chi2 = 0.041724     d = 0.041724     a = 1.01507     t = 0.0202326
Bi: ratio chi2Mono/chi2Bi = 0.999475     d = 0.0002     a =
 1.0747     a1 = 0.455271     t1 =0.0157104     t2 = 0.028924
Long trace was used for fitting.
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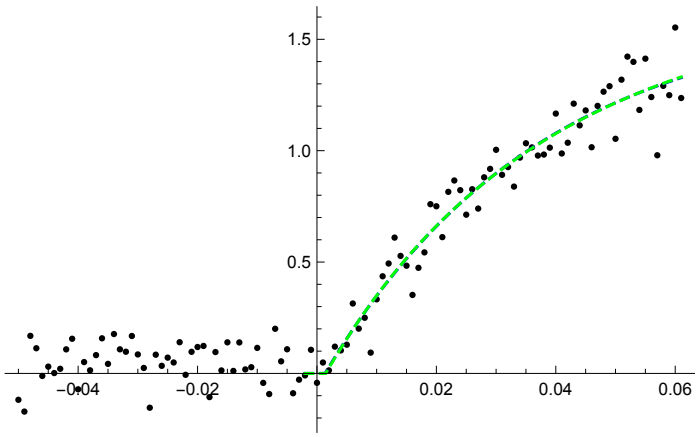


```
Mono: chi2 = 1.13338     d = 0.00137214     a = 1.64629     t = 0.0362917
Bi: ratio chi2Mono/chi2Bi = 1.00009     d = 0.00145814     a =
 1.77764     a1 = 0.924758     t1 =0.0280273     t2 = 0.0639835
-------------------------------------------------------------------------------------
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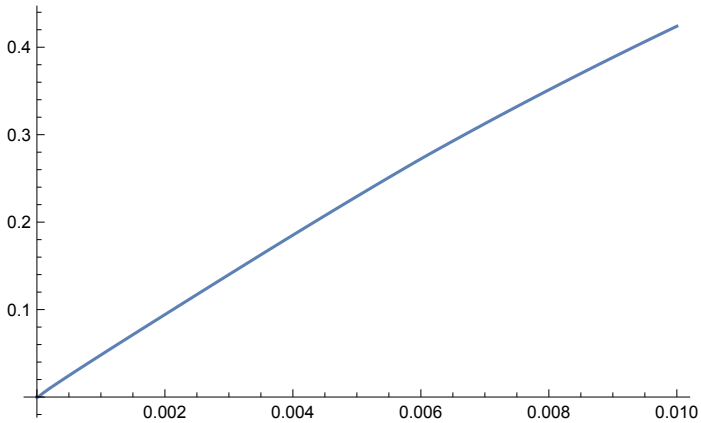
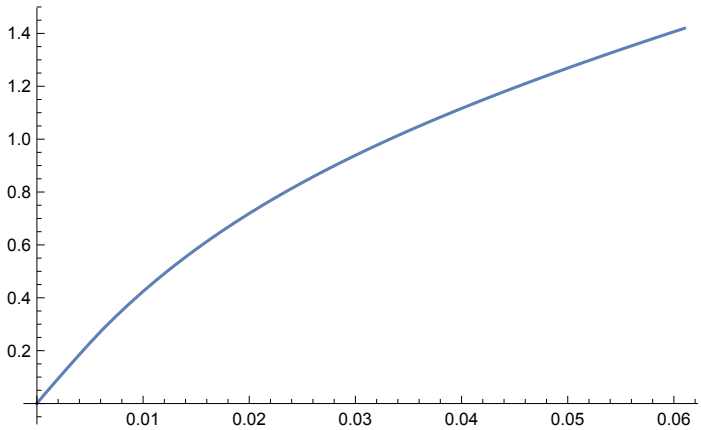
---------- Ca = 1.71772
uM ----------





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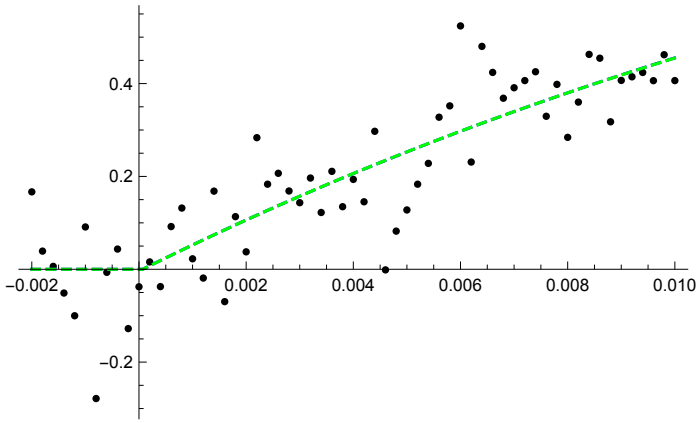


```
Mono: chi2 = 0.51395     d = 0.51395     a = 1.21135     t = 0.0210638

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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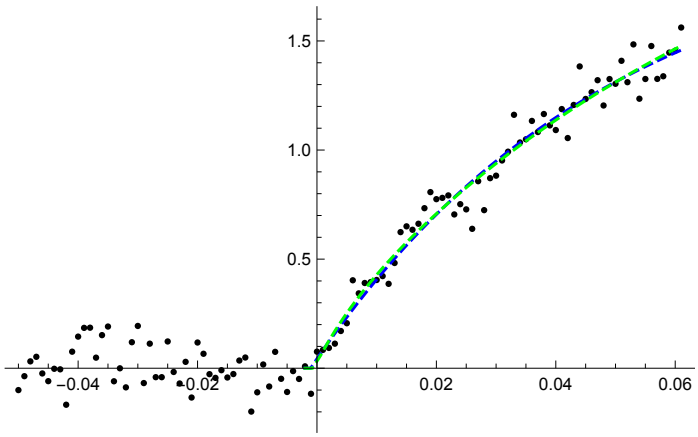


```
Mono: chi2 = 0.809193     d = -0.0010555     a = 2.04903     t = 0.0499222
Bi: ratio chi2Mono/chi2Bi = 1.0121     d = -0.000521126     a =
 2.5562     a1 = 0.148619     t1 =0.00647366     t2 = 0.0766155
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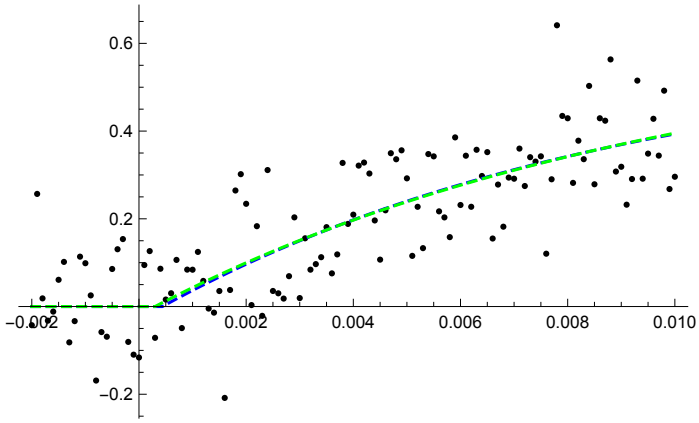


```
Mono: chi2 = 1.22376     d = 1.22376     a = 0.594543     t = 0.00882443
Bi: ratio chi2Mono/chi2Bi = 1.00025     d = 0.0003     a =
 1.07172     a1 = 0.604935     t1 =0.00966288     t2 = 0.3719
Long trace was used for fitting.
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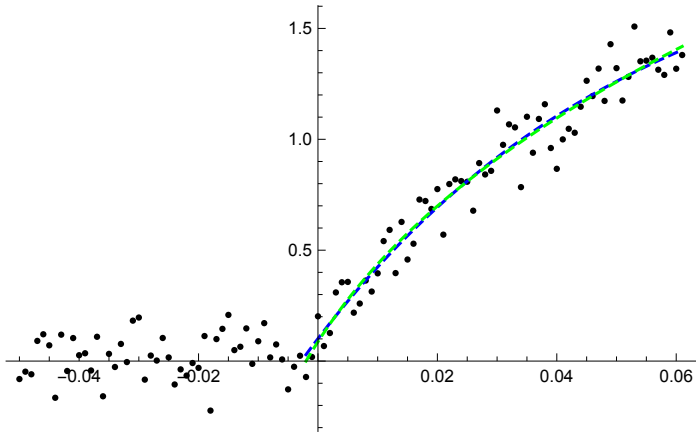


```
Mono: chi2 = 1.0802     d = -0.00278475     a = 2.04008     t = 0.0548231

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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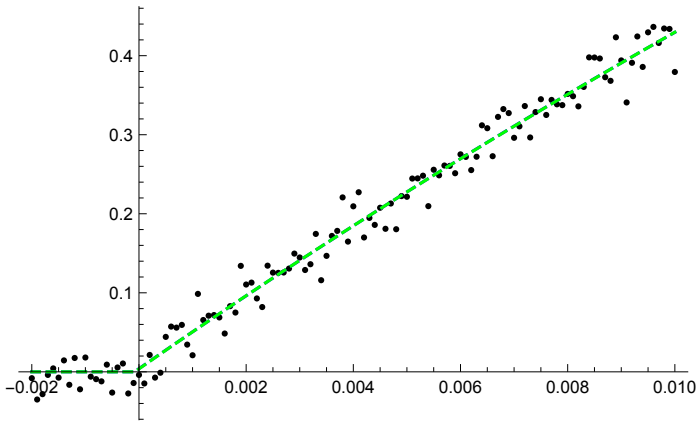


```
Mono: chi2 = 0.0469234     d = 0.0469234     a = 2.30796     t = 0.0489761
Bi: ratio chi2Mono/chi2Bi = 1.00006     d = -0.000079117     a =
 3.23065     a1 = 0.0429573     t1 =0.00838101     t2 = 0.0752451
Long trace was used for fitting.
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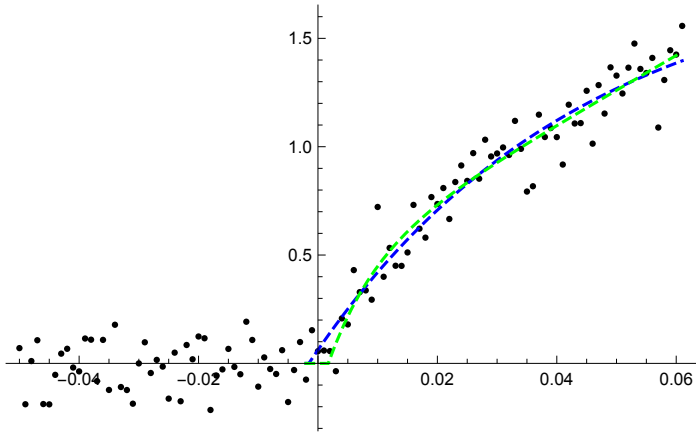


```
Mono: chi2 = 1.30381     d = -0.0015254     a = 1.85875     t = 0.0449376
Bi: ratio chi2Mono/chi2Bi = 1.03931     d = 0.00174036     a =
 52.0993     a1 = 0.48146     t1 =0.00782422     t2 = 3.17031
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  -------------------------
----------------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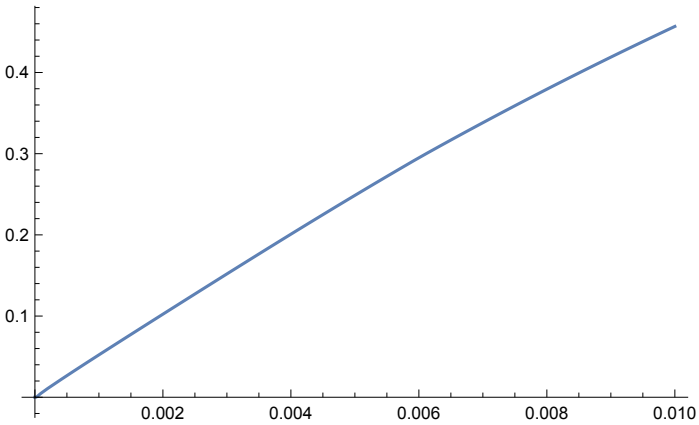

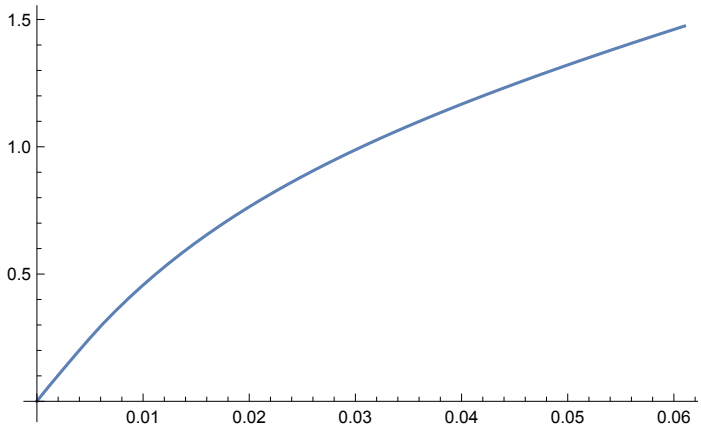

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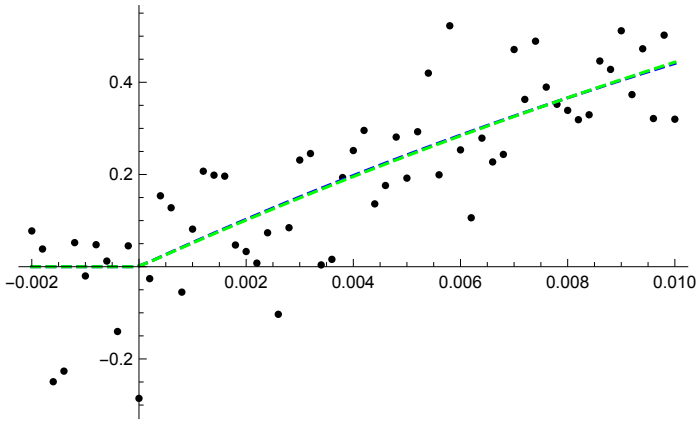

Mono: chi2 = 0.732504 d = 0.732504 a = 1.33555 t = 0.0249587

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

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

Long trace was used for fitting.

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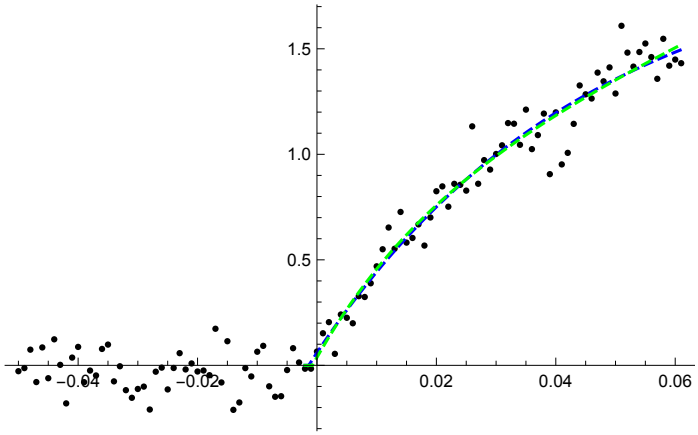


```
Mono: chi2 = 0.997972     d = -0.00137345     a = 2.00688     t = 0.0456164
Bi: ratio chi2Mono/chi2Bi = 1.00838     d = -0.00074082
      a = 16.8334     a1 = 0.699727     t1 =0.0186739     t2 = 1.14665
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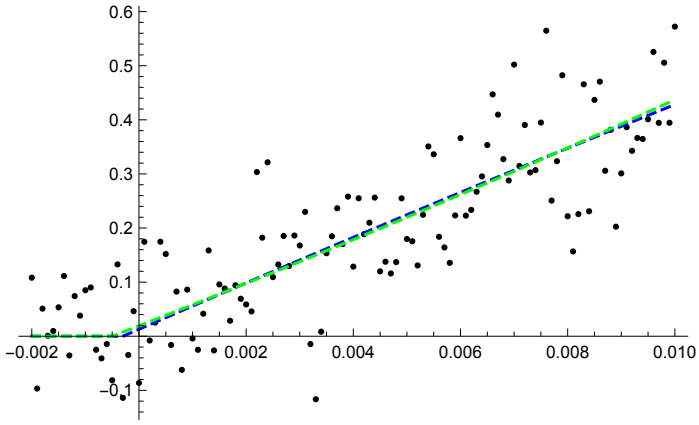

```
Mono: chi2 = 0.963375     d = 0.963375     a = 5.92662     t = 0.137335
Bi: ratio chi2Mono/chi2Bi = 1.00088     d = -0.0005     a =
 -3.15598     a1 = -0.840659     t1 =-0.0441993     t2 = -0.120088
Long trace was used for fitting.
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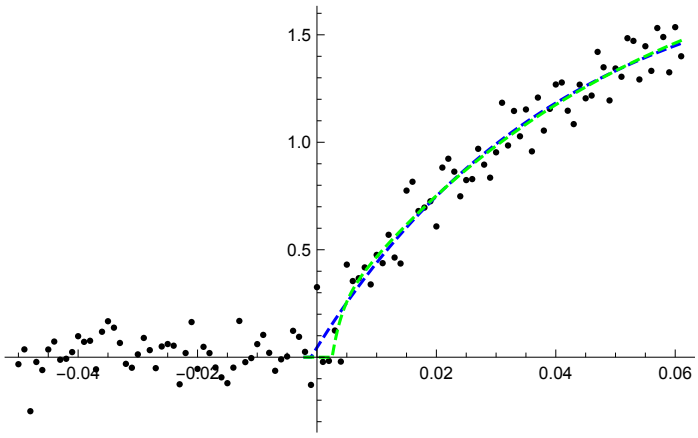


```
Mono: chi2 = 1.00512      d = -0.001      a = 1.87766      t = 0.0412517
Bi: ratio chi2Mono/chi2Bi = 1.0267      d = 0.00254419      a =
 2.06773      a1 = 0.220655      t1 =0.00162263      t2 = 0.0515413
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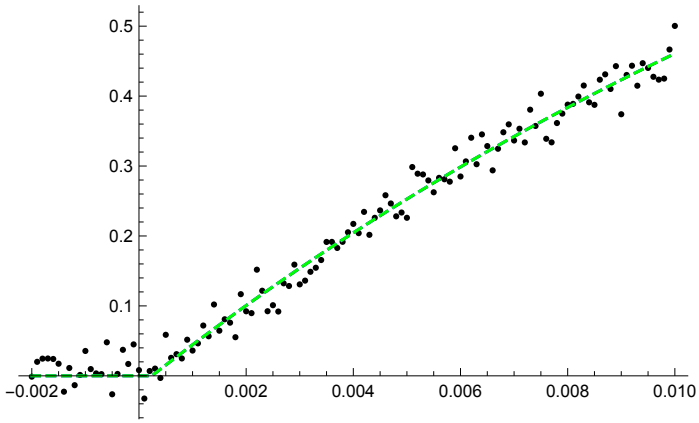


```
Mono: chi2 = 0.0503609     d = 0.0503609     a = 1.19136     t = 0.0199575
Bi: ratio chi2Mono/chi2Bi = 1.00003     d = 0.00024049     a =
 0.903193     a1 = 1.20623     t1 =0.0200952     t2 = 0.891863
Long trace was used for fitting.
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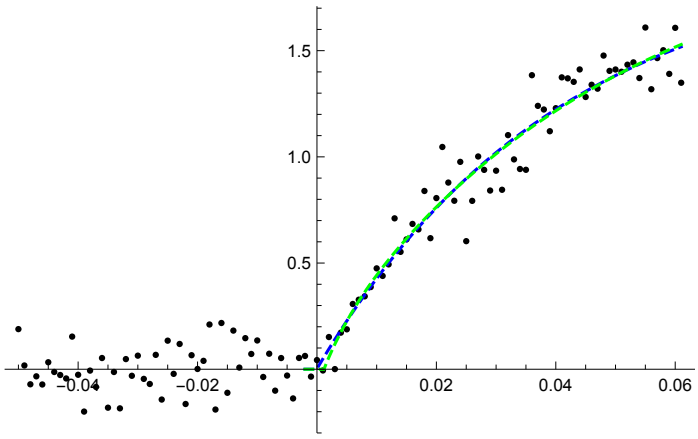


```
Mono: chi2 = 1.23997     d = -0.0000409307     a = 1.95501     t = 0.0407236
Bi: ratio chi2Mono/chi2Bi = 1.00696     d = 0.0011718     a =
 2.11355     a1 = 0.135695     t1 =0.00443717     t2 = 0.0490842
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---------- Ca = 1.90732
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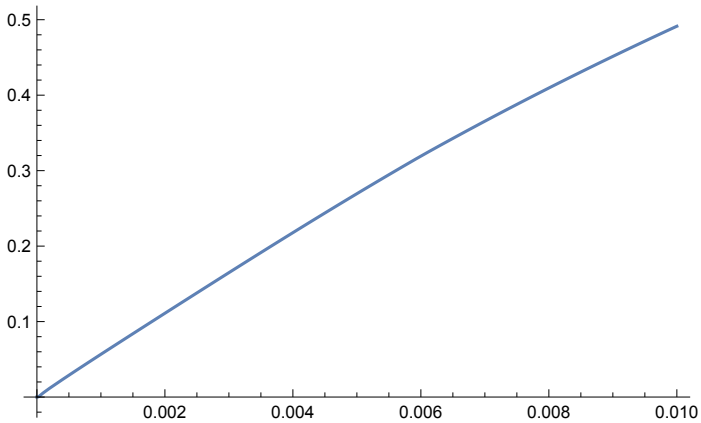

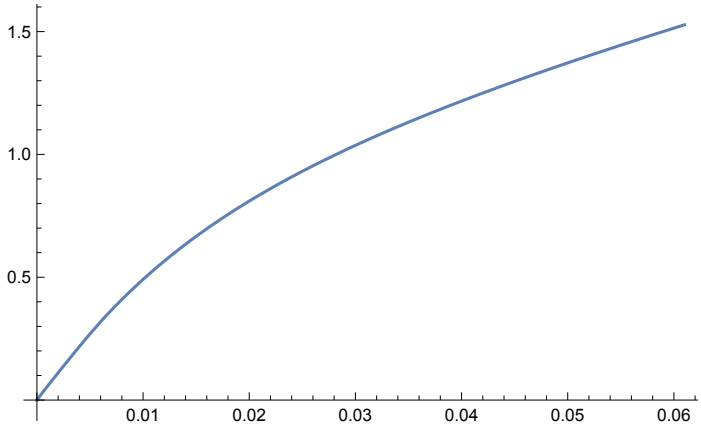

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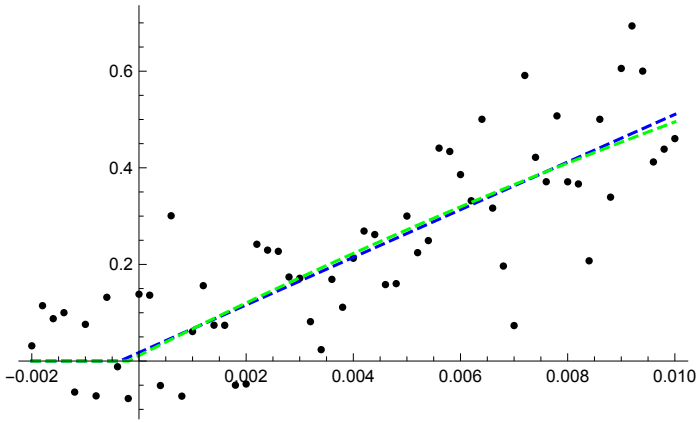

Mono: chi2 = 0.752515 d = 0.752515 a = 7.12947×10^6 t = 144 629.

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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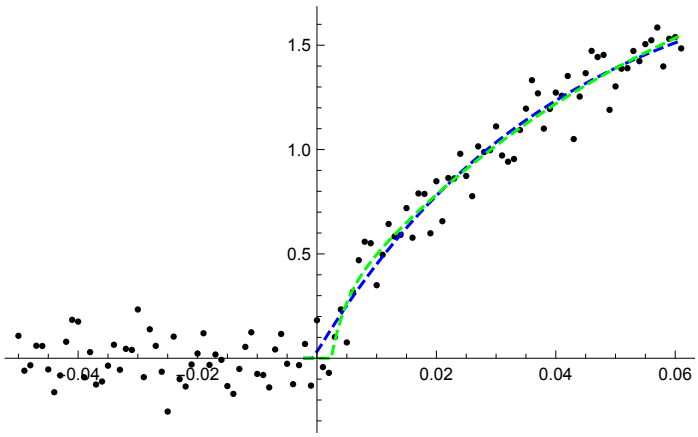


```
Mono: chi2 = 1.1574     d = -0.000625278     a = 1.94237     t = 0.0402463
Bi: ratio chi2Mono/chi2Bi = 1.06194     d = 0.00238983     a =
 2.35643     a1 = 0.264684     t1 =0.00232219     t2 = 0.0617108
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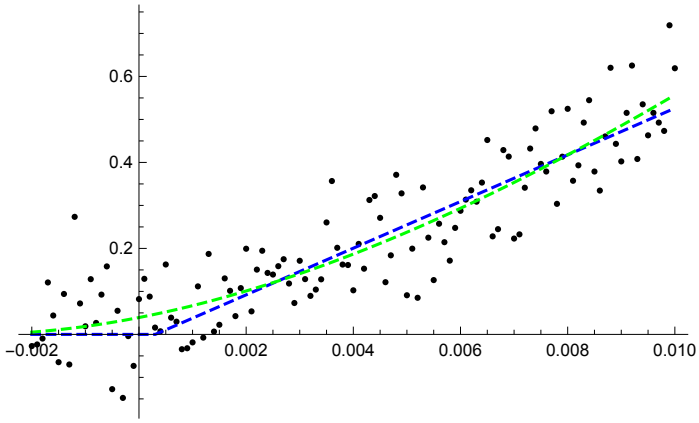

Mono: chi2 = 0.877876 d = 0.877876 a = 1.46106×10^{7} t = 269 319.

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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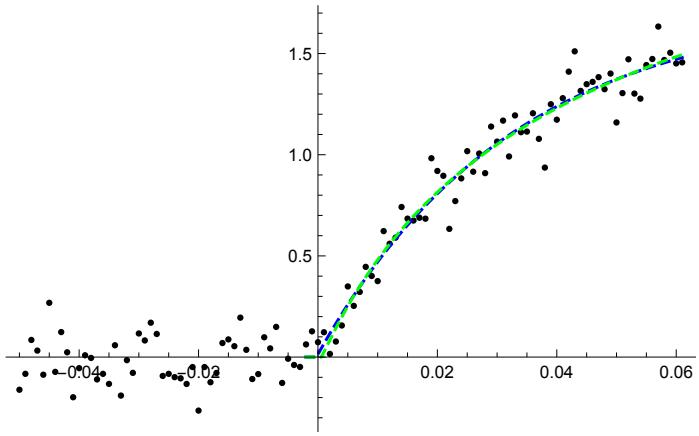


```
Mono: chi2 = 1.19715     d = -0.00025498     a = 1.74807     t = 0.032662

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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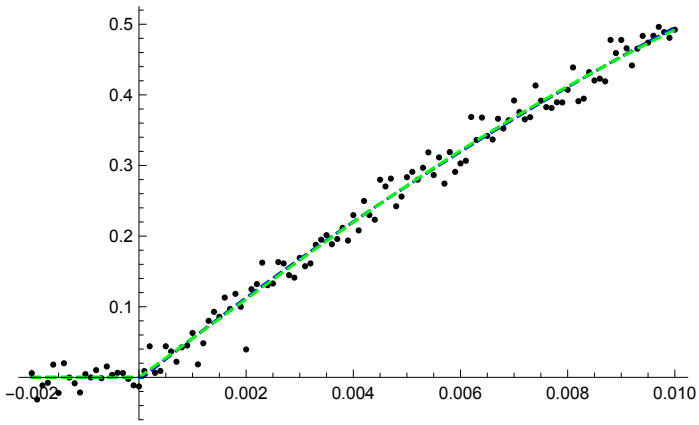

Mono: chi2 = 0.0366879 d = 0.0366879 a = 1.48669 t = 0.0245017

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

Long trace was used for fitting.

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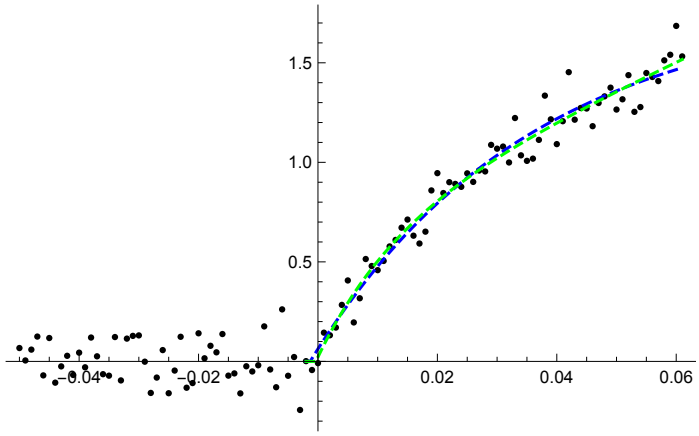


```
Mono: chi2 = 0.954382     d = -0.00129773     a = 1.80729     t = 0.0367951
Bi: ratio chi2Mono/chi2Bi = 1.03234     d = -0.000346699
      a = 41.5483     a1 = 0.654458     t1 =0.0131729     t2 = 2.85848
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----------------     Ca = 2.01009
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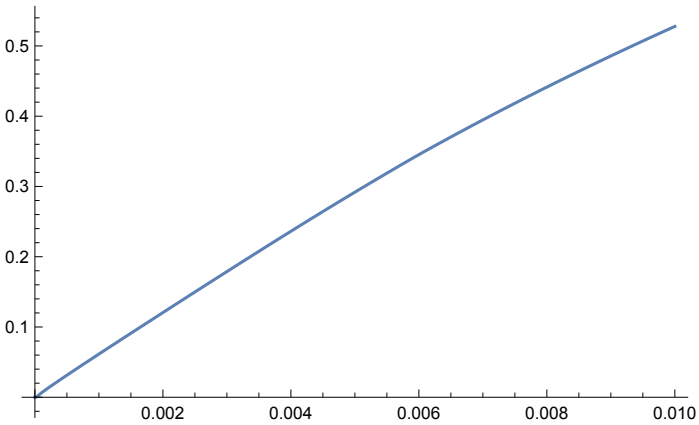

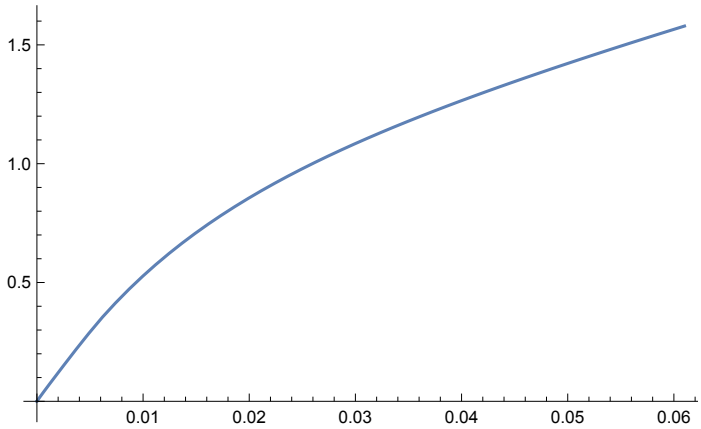

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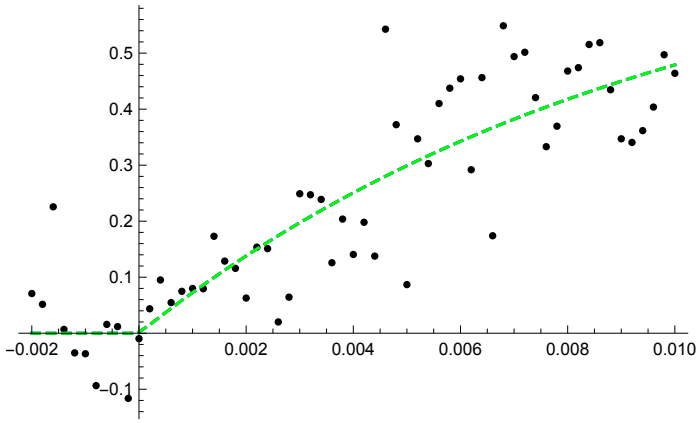

Mono: chi2 = 0.513219 d = 0.513219 a = 0.751031 t = 0.00984808

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

Long trace was used for fitting.

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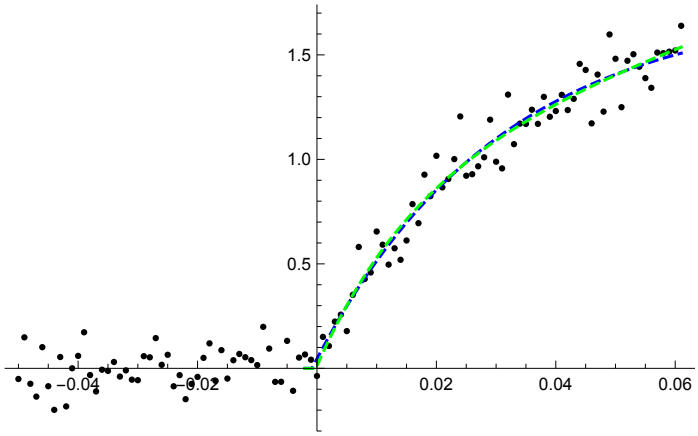


```
Mono: chi2 = 0.969997     d = -0.000817519     a = 1.74668     t = 0.0310483
Bi: ratio chi2Mono/chi2Bi = 1.01195     d = -0.000177686
      a = 13.4552     a1 = 0.92592     t1 =0.0167637     t2 = 1.17551
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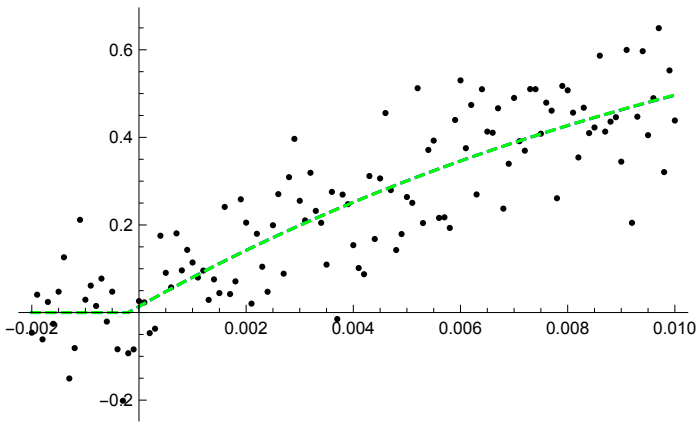

```
Mono: chi2 = 1.16326     d = 1.16326     a = 0.913124     t = 0.0130119
Bi: ratio chi2Mono/chi2Bi = 0.999995     d = -0.0002     a =
 1.30614     a1 = 0.873714     t1 =0.0127596     t2 = 0.273298
Long trace was used for fitting.
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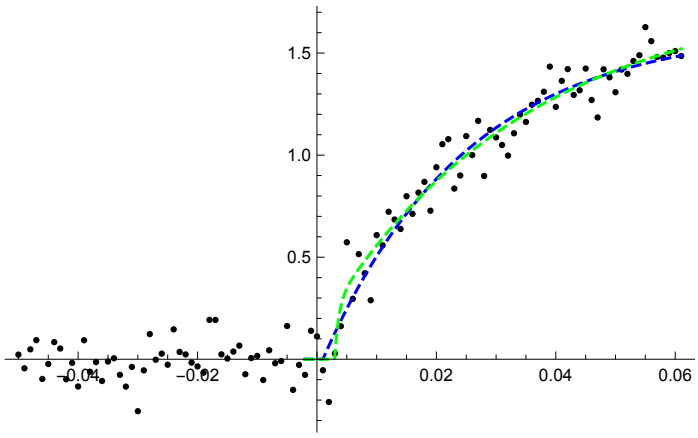


```
Mono: chi2 = 1.05028      d = 0.001      a = 1.62329      t = 0.024174
Bi: ratio chi2Mono/chi2Bi = 1.11219      d = 0.00295803      a =
 1.79733      a1 = 0.271603      t1 =0.000703208      t2 = 0.0339982
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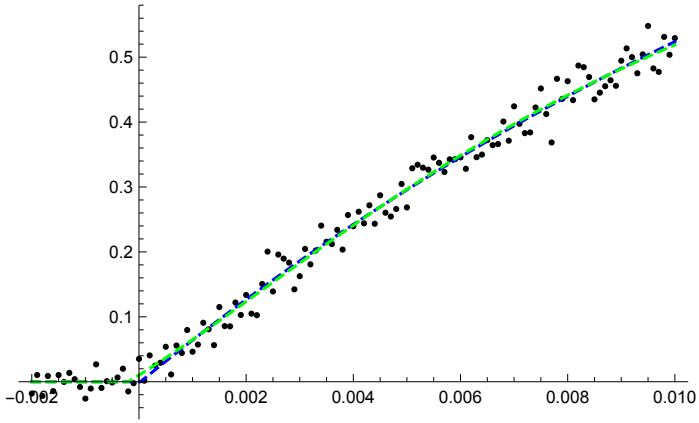


```
Mono: chi2 = 0.049871     d = 0.049871     a = 1.27429     t = 0.0188329
Bi: ratio chi2Mono/chi2Bi = 1.0185     d = -0.0002     a =
 0.835119     a1 = -0.232544     t1 =0.00310505     t2 = 0.00857539
Long trace was used for fitting.
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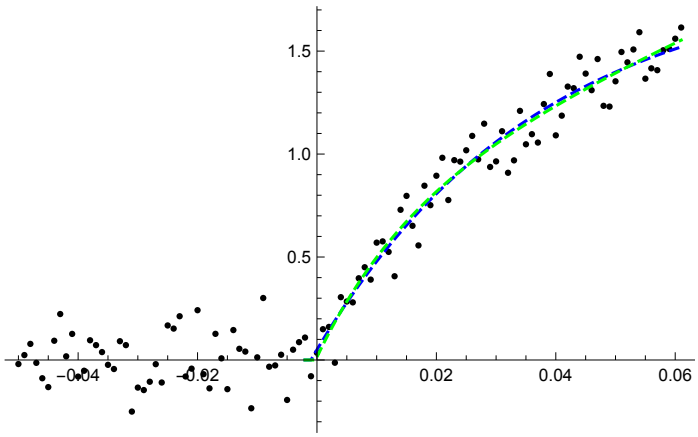


```
Mono: chi2 = 1.32479     d = -0.001     a = 1.87648     t = 0.0373146
Bi: ratio chi2Mono/chi2Bi = 1.01208     d = -0.000240377
      a = 25.0857     a1 = 0.753643     t1 =0.015764     t2 = 1.79757
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---------- Ca = 2.11924
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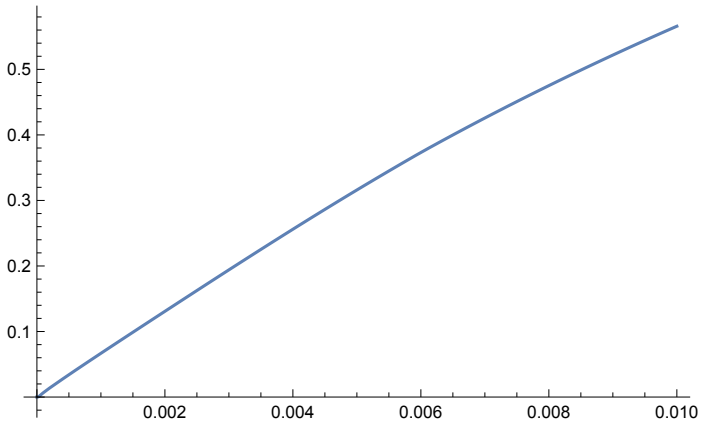

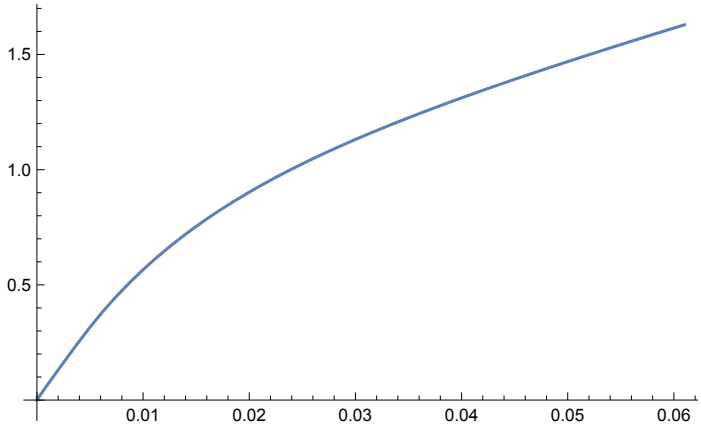

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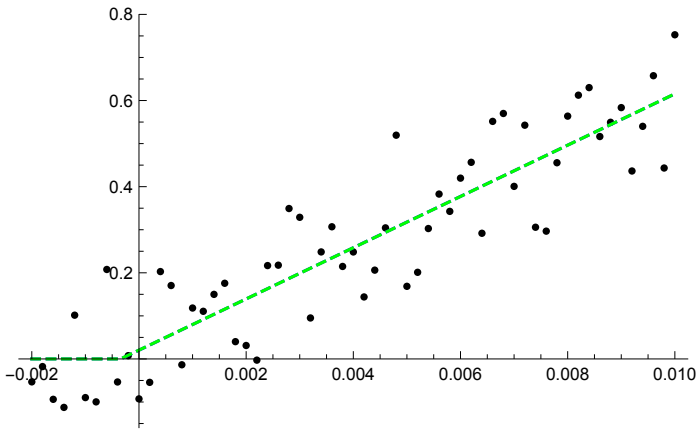

Mono: chi2 = 0.612789 d = 0.612789 a = 1.27923×10^6 t = 21496.7

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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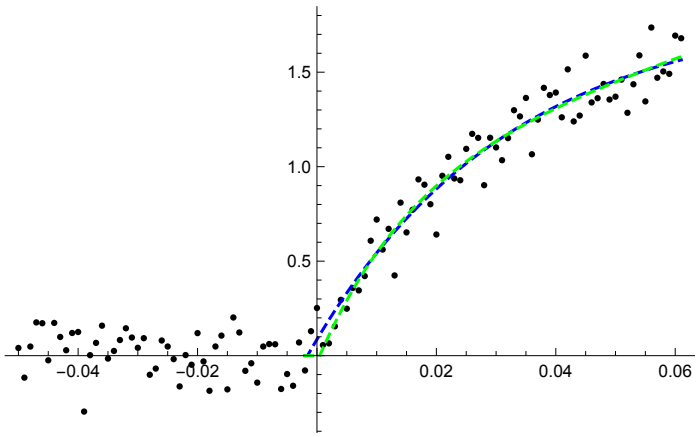


```
Mono: chi2 = 1.39959     d = -0.00158523     a = 1.84409     t = 0.0331515
Bi: ratio chi2Mono/chi2Bi = 0.992475     d = 0.000464406
      a = 12.6452     a1 = 0.957877     t1 =0.0154625     t2 = 1.06848
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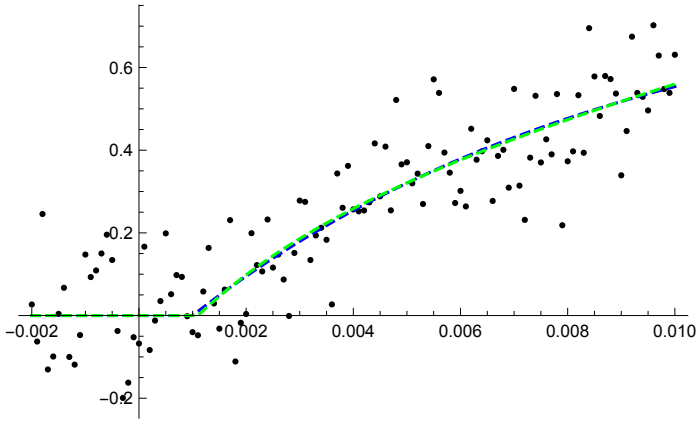


```
Mono: chi2 = 1.26591     d = 1.26591     a = 0.834102     t = 0.00825335
Bi: ratio chi2Mono/chi2Bi = 1.00569     d = 0.0011     a =
 1.75735     a1 = 0.149892     t1 =0.00216857     t2 = 0.0300148
Long trace was used for fitting.
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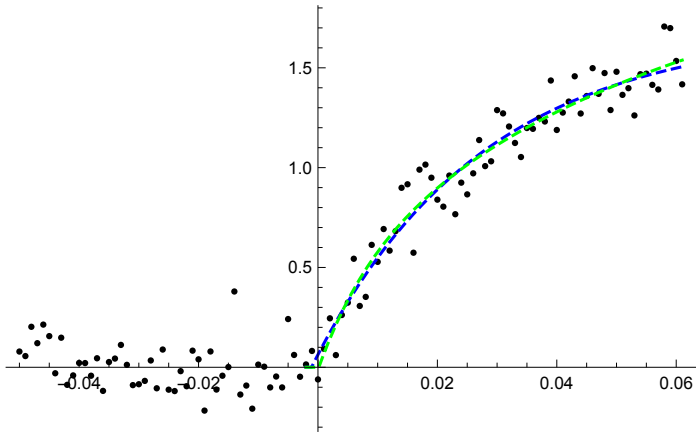


```
Mono: chi2 = 1.40533     d = -0.0010755     a = 1.69379     t = 0.0282737

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

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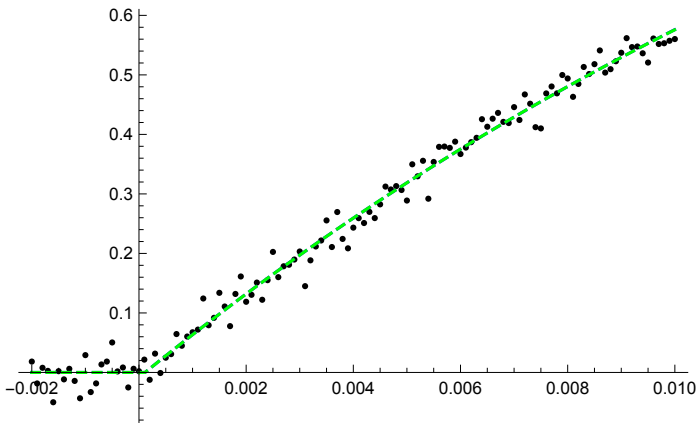


```
Mono: chi2 = 0.0517891     d = 0.0517891     a = 1.52731     t = 0.0208808
Bi: ratio chi2Mono/chi2Bi = 1.00082     d = 0.000112787
      a = 0.887662     a1 = 2.70468     t1 =0.026379     t2 = 0.061553
Long trace was used for fitting.
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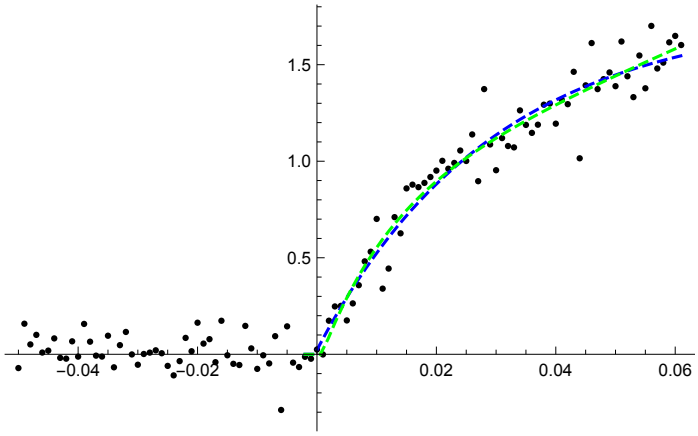


```
Mono: chi2 = 1.12527     d = -0.000372584     a = 1.76624     t = 0.0294662
Bi: ratio chi2Mono/chi2Bi = 1.04203     d = 0.000841794
      a = 35.1264     a1 = 0.788637     t1 =0.0116994     t2 = 2.51455
-------------------------------------------------------------------------------------
  -------------------------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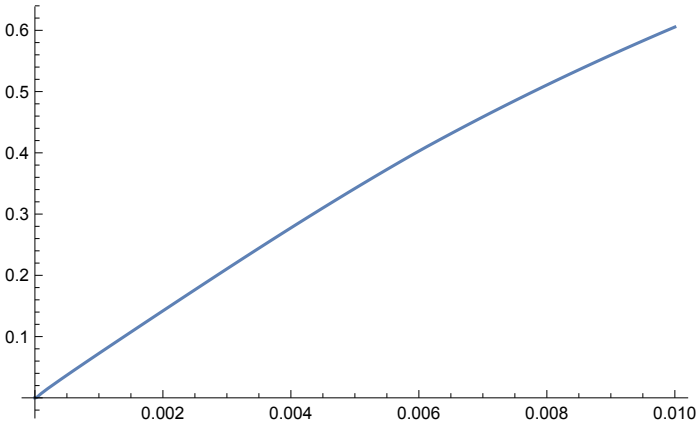

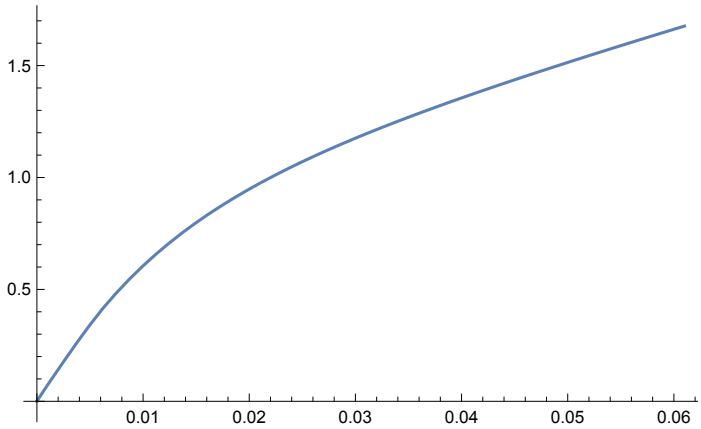

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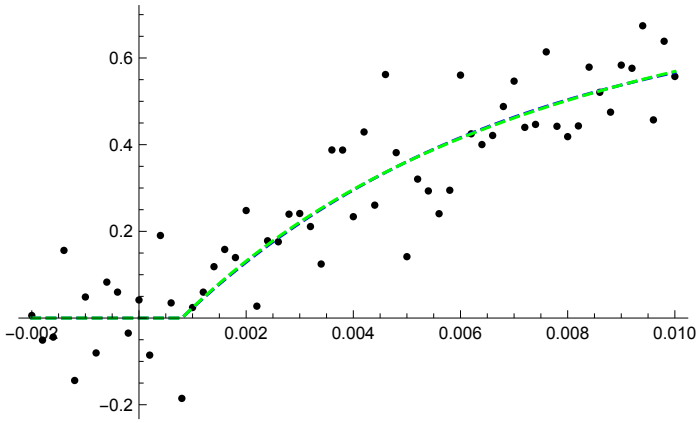


```
Mono: chi2 = 0.507059     d = 0.507059     a = 0.732355     t = 0.00619055
Bi: ratio chi2Mono/chi2Bi = 1.00344     d = 0.0008     a =
 1.62526     a1 = 0.492092     t1 =0.0046792     t2 = 0.0668318
Long trace was used for fitting.
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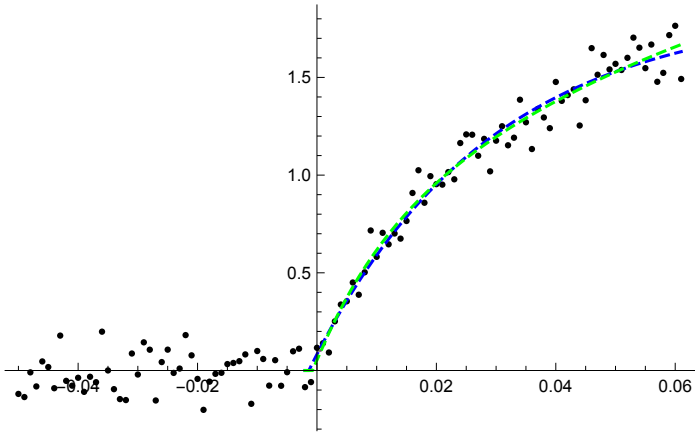


```
Mono: chi2 = 0.937142     d = -0.00135266     a = 1.86048     t = 0.0297502
Bi: ratio chi2Mono/chi2Bi = 1.02557     d = -0.000666805     a =
 2.68609     a1 = 0.635782     t1 =0.0116225     t2 = 0.0876555
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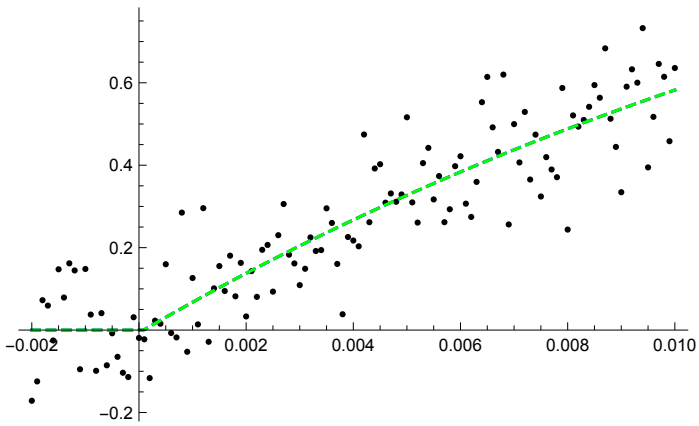

```
Mono: chi2 = 1.12832     d = 1.12832     a = 1.415     t = 0.0186968
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.0000897283     a =
 4.76626     a1 = 0.902795     t1 =0.0145274     t2 = 0.275918
Long trace was used for fitting.
take bi
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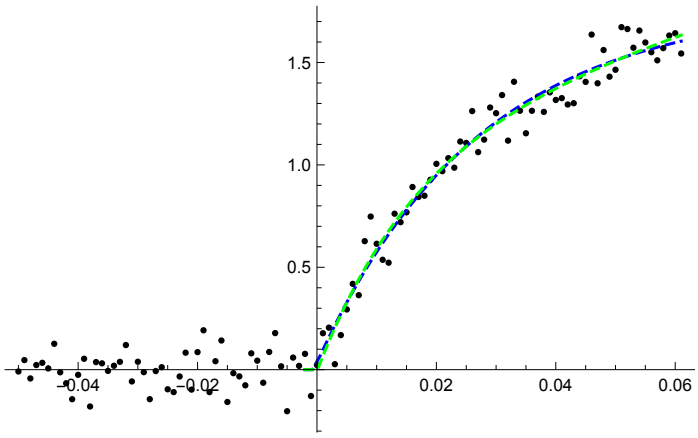


```
Mono: chi2 = 0.860188      d = -0.000507576      a = 1.78915      t = 0.0271104
Bi: ratio chi2Mono/chi2Bi = 1.01226      d = 0.0000994137
      a = 11.0336      a1 = 1.09437      t1 =0.016416      t2 = 1.03877
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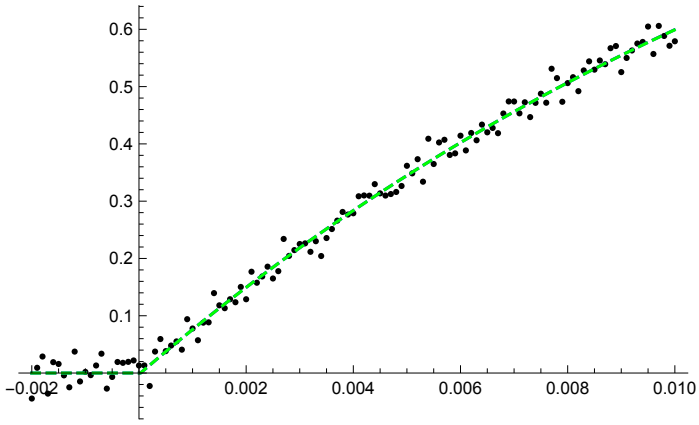


```
Mono: chi2 = 0.0400537     d = 0.0400537     a = 1.30007     t = 0.0161286
Bi: ratio chi2Mono/chi2Bi = 1.00038     d = 0.0000285641     a =
 1.04998     a1 = 1.65092     t1 =0.0179646     t2 = 0.0524694
Long trace was used for fitting.
take mono
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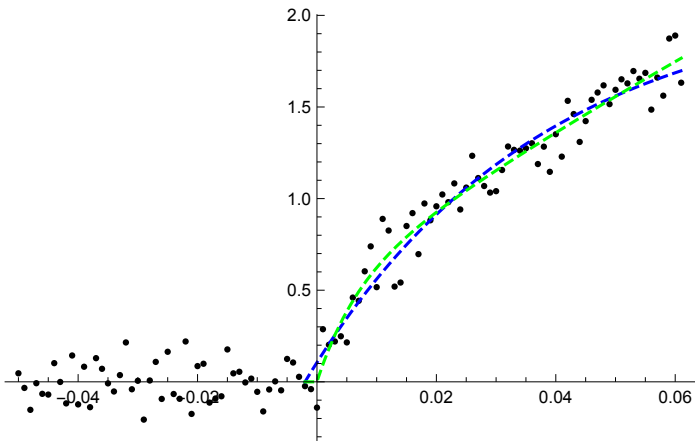


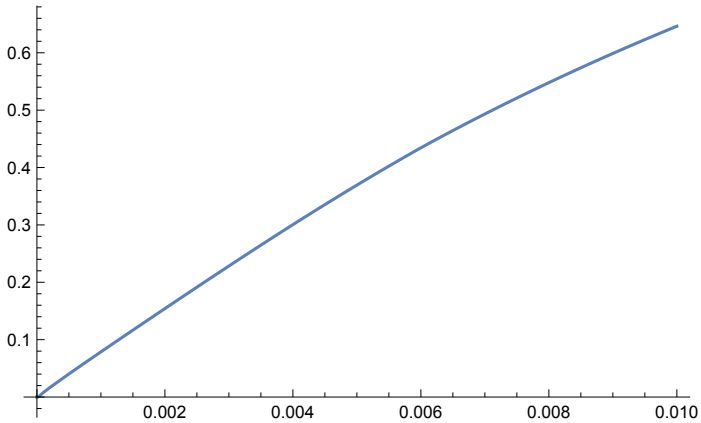
Mono: chi2 = 1.33667 d = -0.002 a = 2.11944 t = 0.0390306

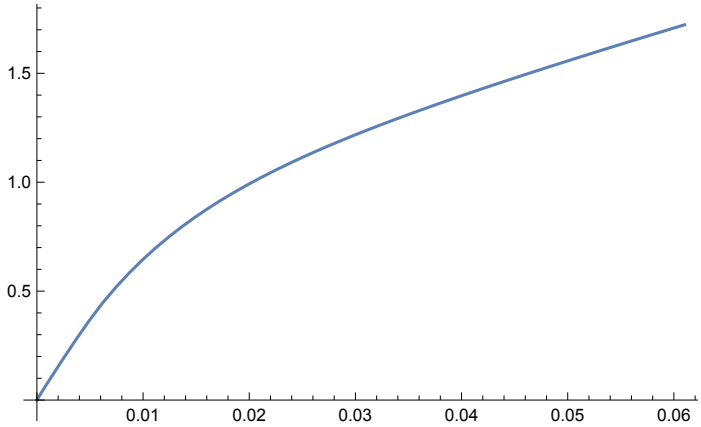
Bi: ratio chi2Mono/chi2Bi = 1.09987 d = -7.3868×10^{-17}

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

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

uM ----------





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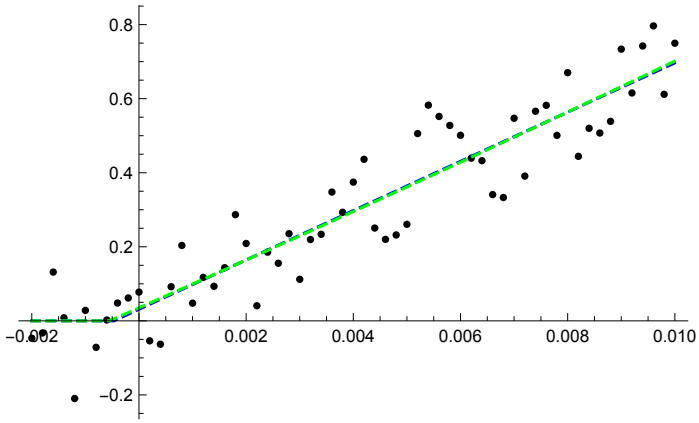

Mono: chi2 = 0.495474 d = 0.495474 a = 1.06577×10^{7} t = 160 178.

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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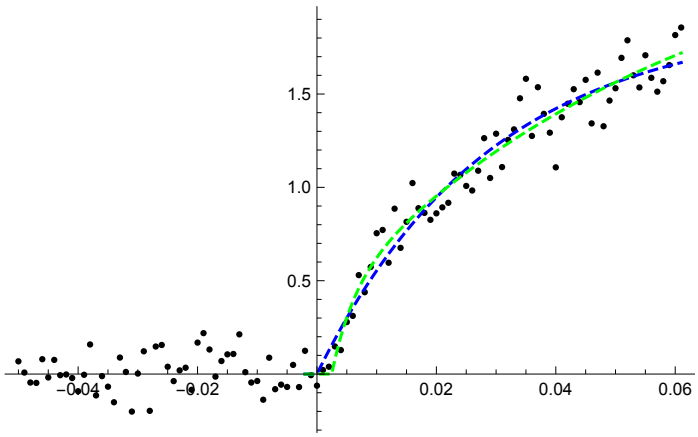

Mono: chi2 = 1.31345 d = -3.85677×10^{-16} a = 1.90036 t = 0.029012

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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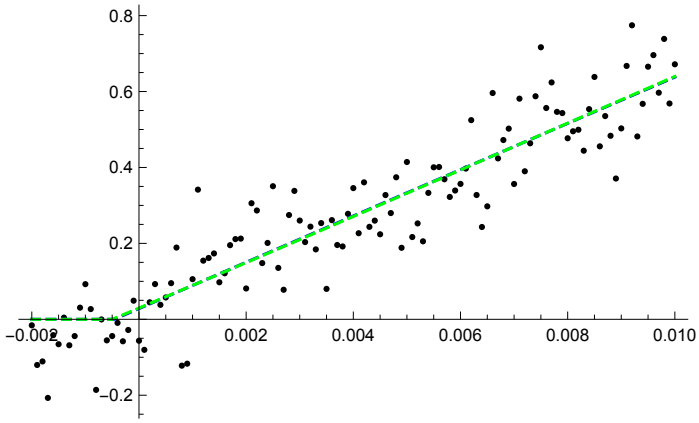

Mono: chi2 = 0.98639 d = 0.98639 a = 5.58835×10^6 t = 91642.6

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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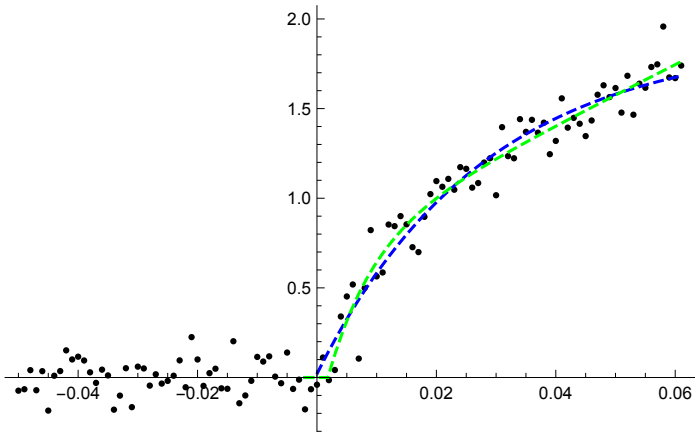


```
Mono: chi2 = 1.28148     d = -0.000293794     a = 1.89455     t = 0.0280043

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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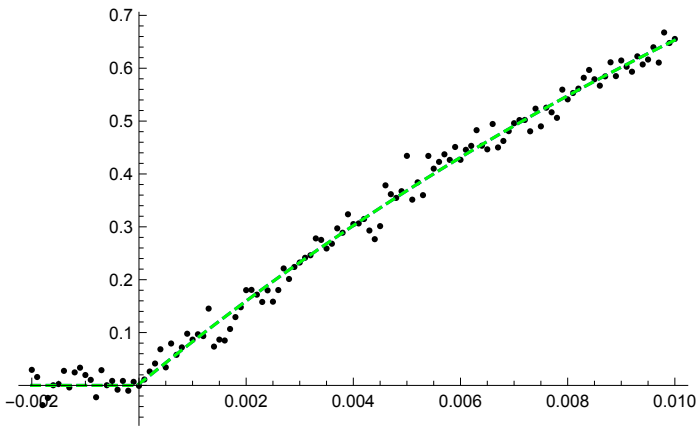

Mono: chi2 = 0.0496532 d = 0.0496532 a = 1.65037 t = 0.0198894

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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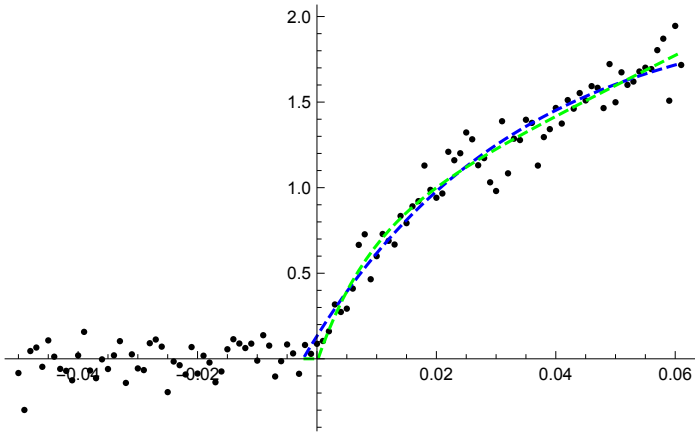
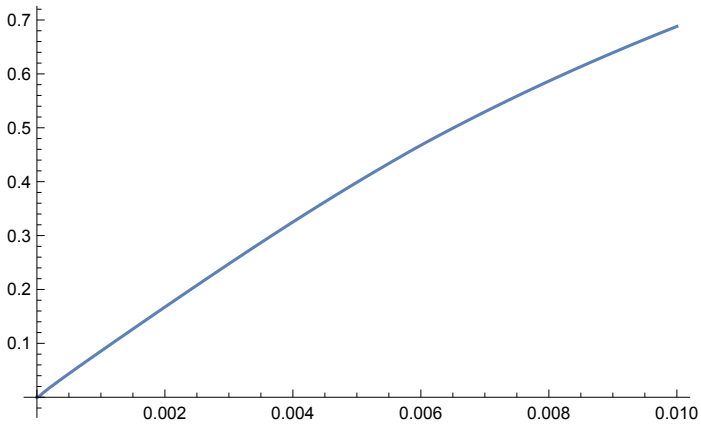
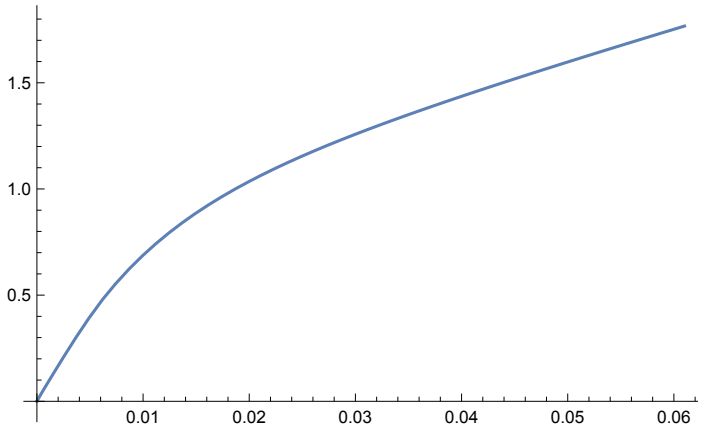



```
Mono: chi2 = 1.19084     d = -0.00231564     a = 2.05489     t = 0.0345059
Bi: ratio chi2Mono/chi2Bi = 1.07738     d = 0.00019385     a =
 49.3355     a1 = 0.717942     t1 =0.00854228     t2 = 2.72361
-------------------------------------------------------------------------------------
  -------------------------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





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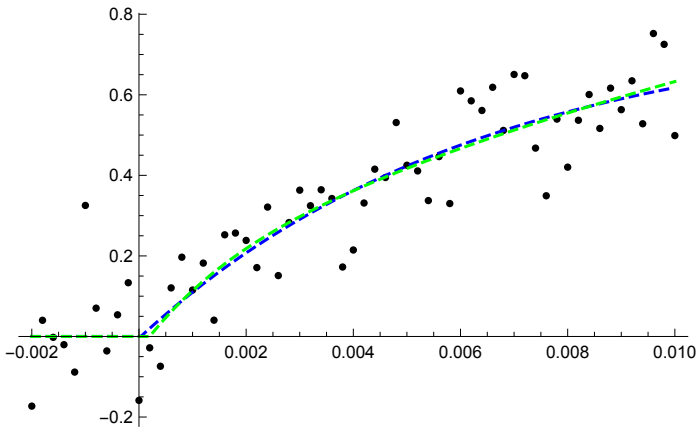


```
Mono: chi2 = 0.585062     d = 0.585062     a = 0.78044     t = 0.00635486
Bi: ratio chi2Mono/chi2Bi = 1.00213     d = 0.0002     a =
 1.44626     a1 = 0.180134     t1 =0.00165722     t2 = 0.022122
Long trace was used for fitting.
take mono
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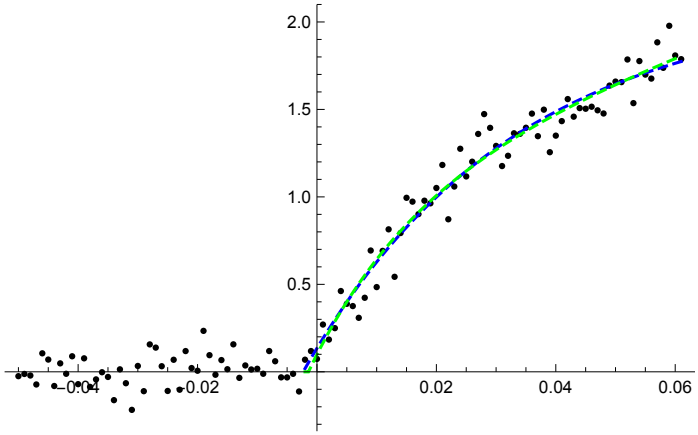


```
Mono: chi2 = 1.05456     d = -0.00230517     a = 2.12376     t = 0.0351107
Bi: ratio chi2Mono/chi2Bi = 1.01872     d = -0.00141981
      a = 34.1558     a1 = 1.04934     t1 =0.0177444     t2 = 2.59645
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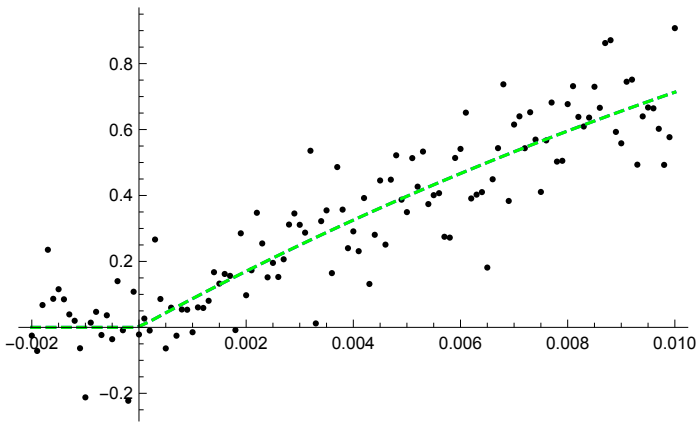

Mono: chi2 = 1.46672 d = 1.46672 a = 1.92928 t = 0.0216649

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

Long trace was used for fitting.

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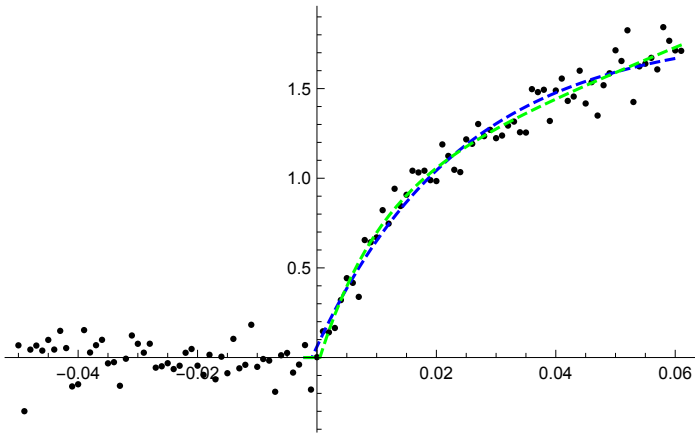


```
Mono: chi2 = 0.96579      d = -0.000835077      a = 1.81882      t = 0.0244283
Bi: ratio chi2Mono/chi2Bi = 1.08873      d = 0.000502934      a =
 26.1979      a1 = 0.906134      t1 =0.00975584      t2 = 1.79293
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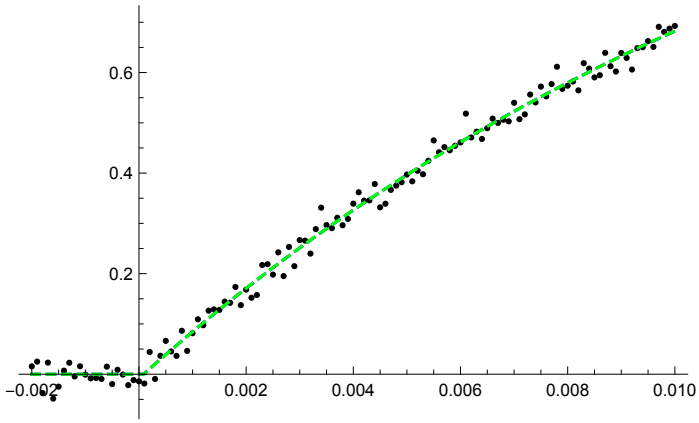


```
Mono: chi2 = 0.0424808     d = 0.0424808     a = 1.36921     t = 0.0143771

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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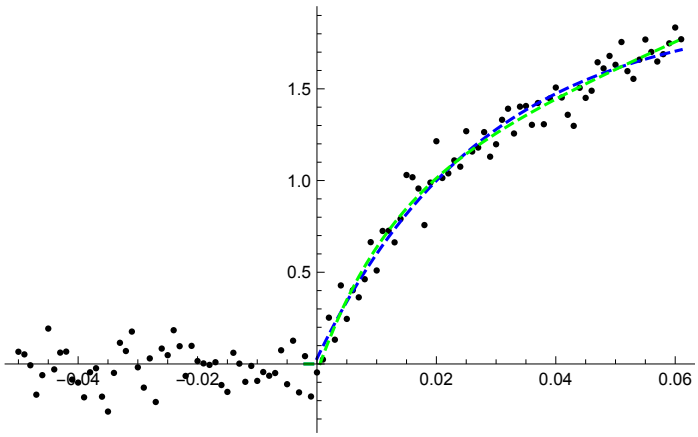


```
Mono: chi2 = 1.07585     d = -0.000431601     a = 1.92667     t = 0.0279341
Bi: ratio chi2Mono/chi2Bi = 1.05223     d = 0.000506915
      a = 29.9604     a1 = 0.90468     t1 =0.0119041     t2 = 1.9862
-------------------------------------------------------------------------------------
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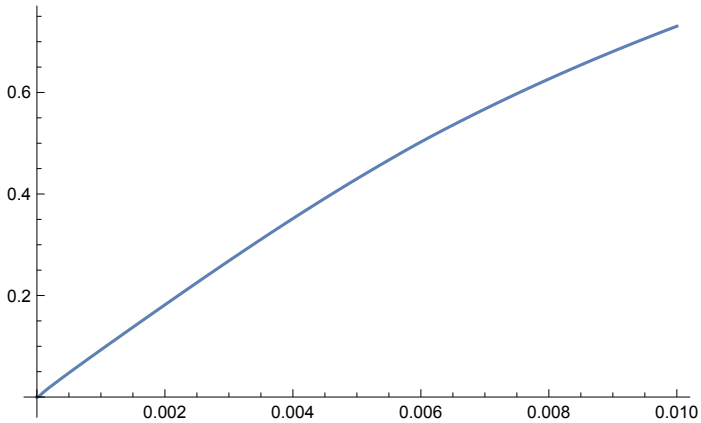
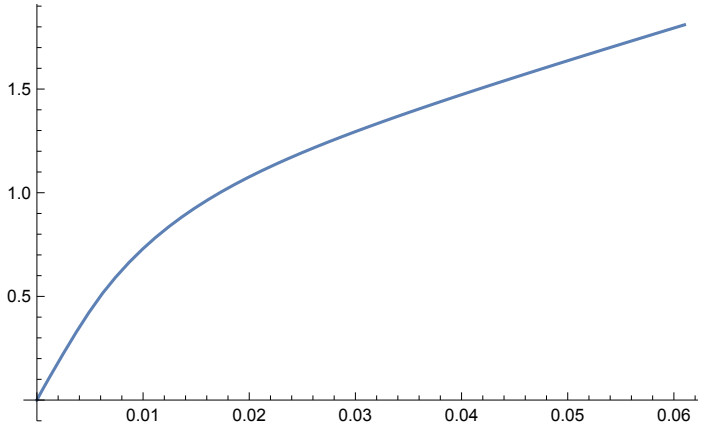
---------- Ca = 2.62605
uM ----------





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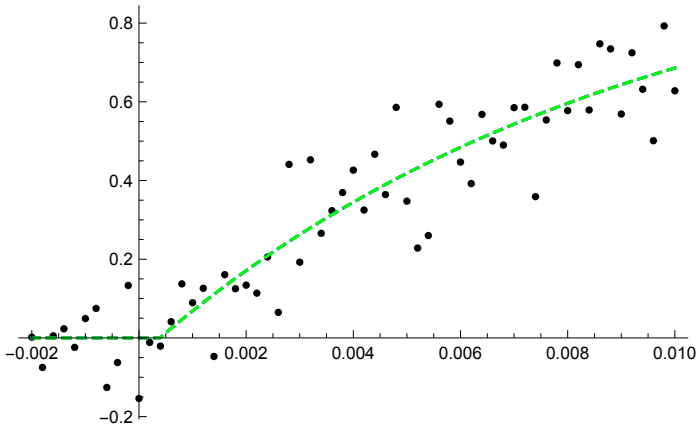


```
Mono: chi2 = 0.545602     d = 0.545602     a = 1.04879     t = 0.00905701

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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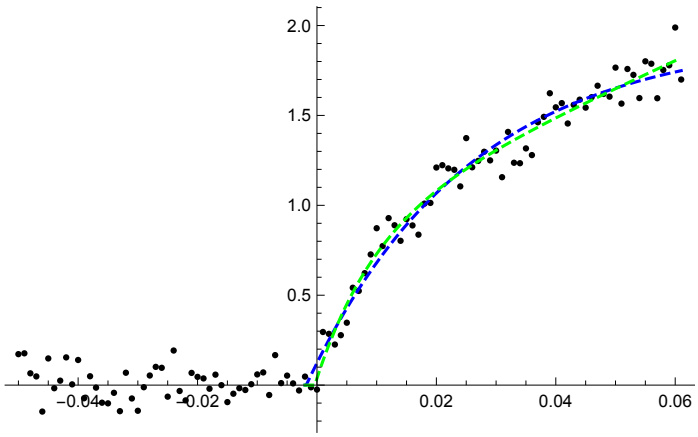


```
Mono: chi2 = 0.94495     d = -0.00179407     a = 1.94488     t = 0.0273627
Bi: ratio chi2Mono/chi2Bi = 1.09483     d = -0.000362811
      a = 20.0092     a1 = 0.865565     t1 =0.009777     t2 = 1.19804
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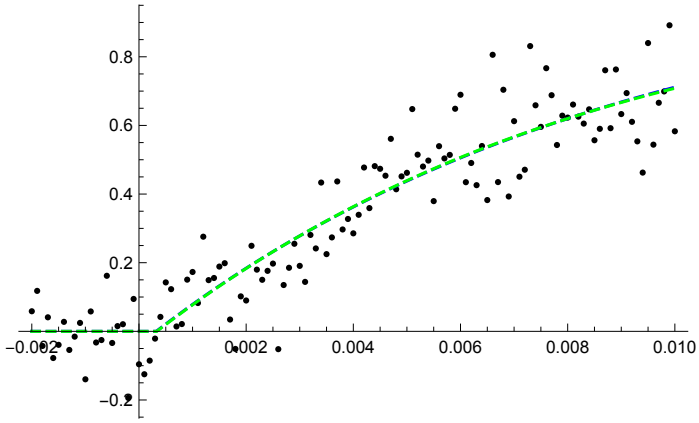


```
Mono: chi2 = 1.19504     d = 1.19504     a = 1.07715     t = 0.00896208
Bi: ratio chi2Mono/chi2Bi = 1.00229     d = 0.00033218     a =
 0.568777     a1 = 2.09264     t1 =0.0118608     t2 = 0.027031
Long trace was used for fitting.
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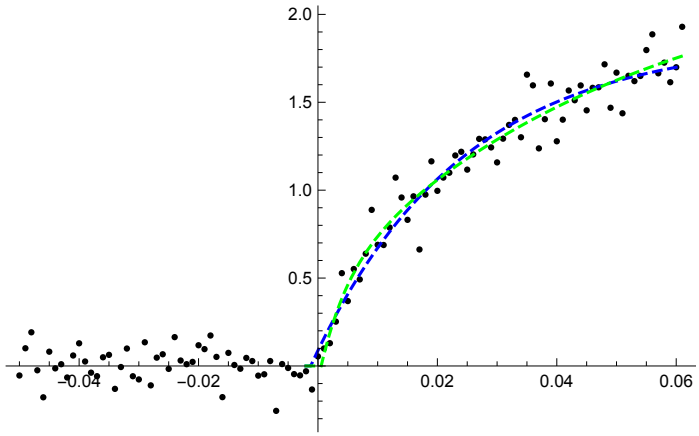


```
Mono: chi2 = 1.23773     d = -0.00121022     a = 1.86008     t = 0.0250095
Bi: ratio chi2Mono/chi2Bi = 1.07672     d = 0.000539822     a =
 2.34811     a1 = 0.48386     t1 =0.0043858     t2 = 0.0521736
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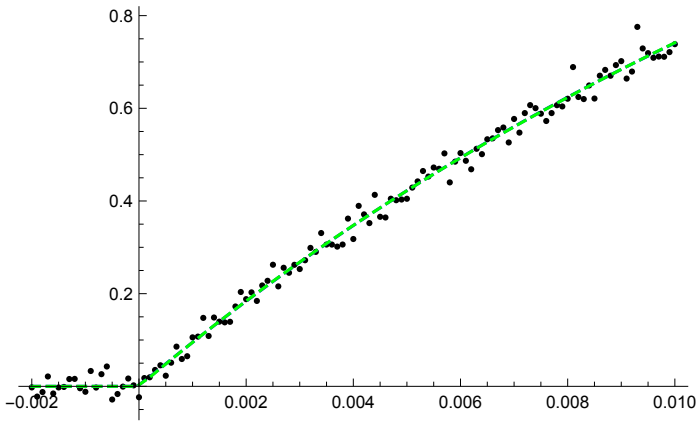

Mono: chi2 = 0.0469049 d = 0.0469049 a = 1.72874 t = 0.0178908

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

Long trace was used for fitting.

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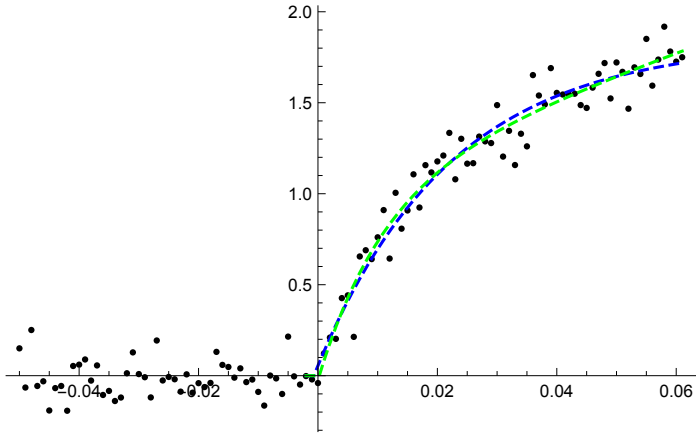


```
Mono: chi2 = 1.21383     d = -0.000681904     a = 1.83565     t = 0.0224082
Bi: ratio chi2Mono/chi2Bi = 1.05536     d = 0.000226306
      a = 17.9833     a1 = 1.03518     t1 =0.0108833     t2 = 1.33835
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----------------     Ca = 2.77177
  uM   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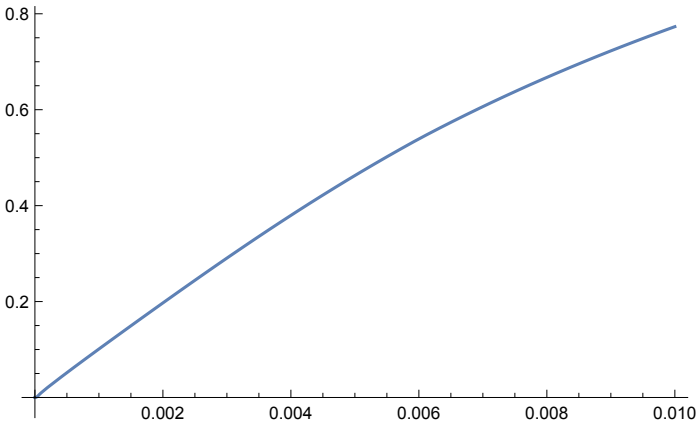

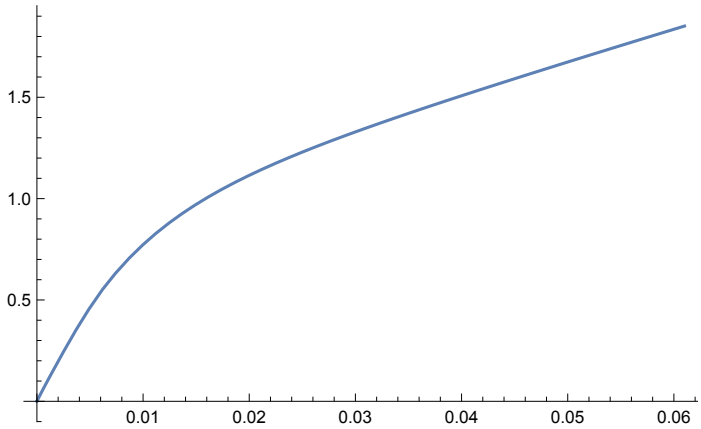

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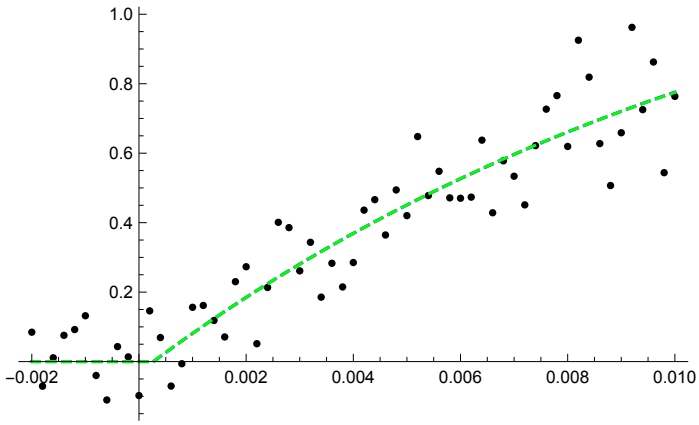


```
Mono: chi2 = 0.631122     d = 0.631122     a = 1.44467     t = 0.0126405
Bi: ratio chi2Mono/chi2Bi = 1.00011     d = 0.000264692     a =
 0.766123     a1 = 2.74218     t1 =0.0167134     t2 = 0.0390828
Long trace was used for fitting.
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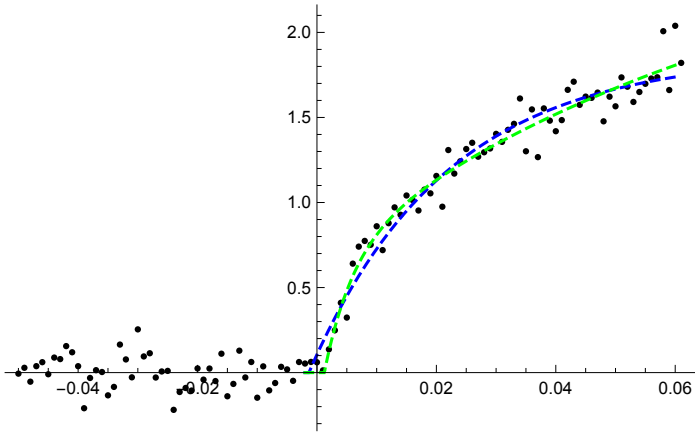


```
Mono: chi2 = 1.11521     d = -0.00134349     a = 1.8674     t = 0.0229892
Bi: ratio chi2Mono/chi2Bi = 1.15955     d = 0.00123123     a =
 2.76304     a1 = 0.691258     t1 =0.00468827     t2 = 0.0759869
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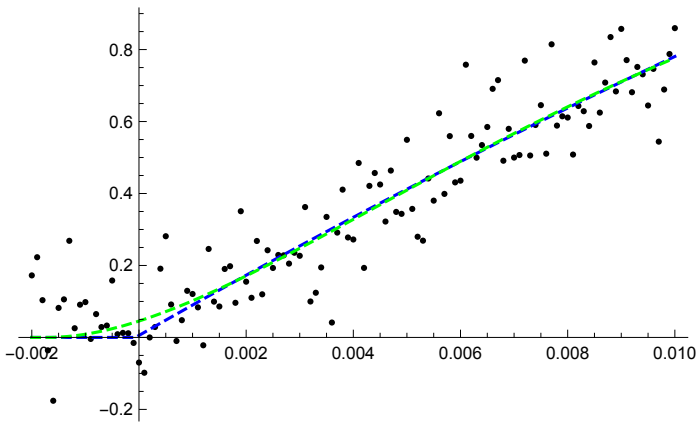

```
Mono: chi2 = 1.21508     d = 1.21508     a = 4.38753     t = 0.0513609
Bi: ratio chi2Mono/chi2Bi = 1.01303     d = -0.00169882     a =
 1.4588     a1 = -1.146     t1 =0.00414811     t2 = 0.00940195
Long trace was used for fitting.
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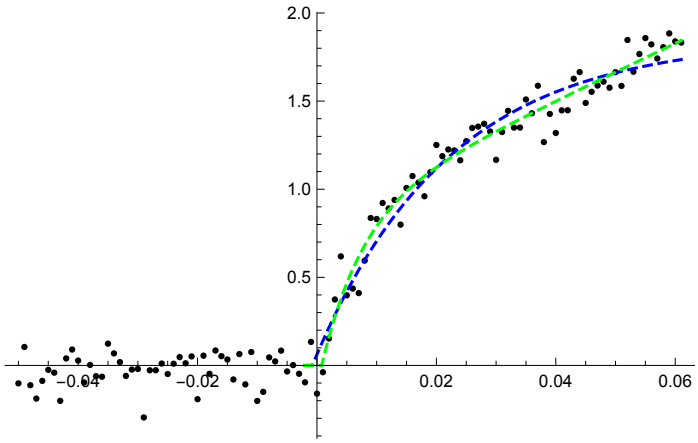


```
Mono: chi2 = 1.2111     d = -0.000766959     a = 1.85409     t = 0.022467
Bi: ratio chi2Mono/chi2Bi = 1.25056     d = 0.000796009     a =
 48.8072     a1 = 0.856033     t1 =0.00671335     t2 = 2.89266
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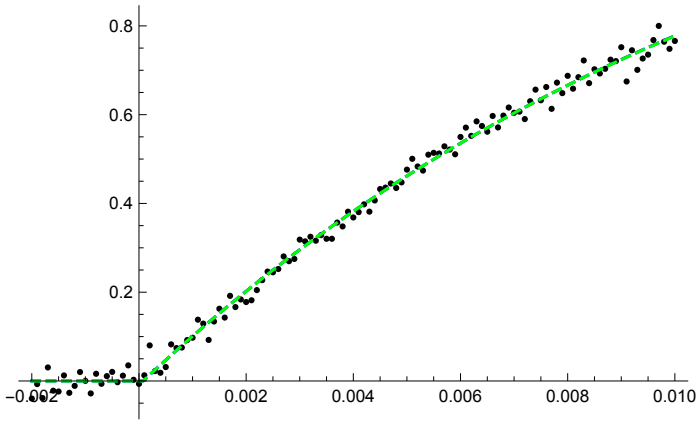


```
Mono: chi2 = 0.044908     d = 0.044908     a = 1.42033     t = 0.0125101

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.

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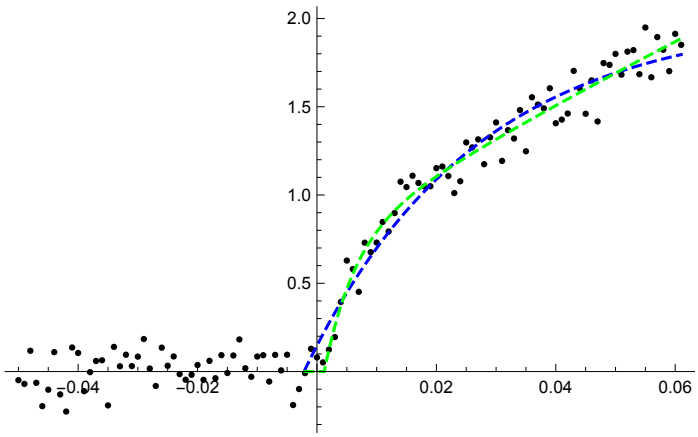


```
Mono: chi2 = 1.22252     d = -0.00216235     a = 2.01582     t = 0.0285395
Bi: ratio chi2Mono/chi2Bi = 1.18082     d = 0.00122177     a =
 7.82044     a1 = 0.741569     t1 =0.00505959     t2 = 0.339021
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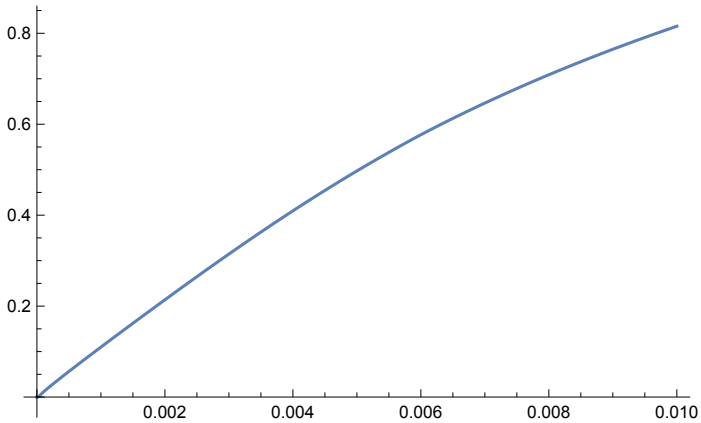
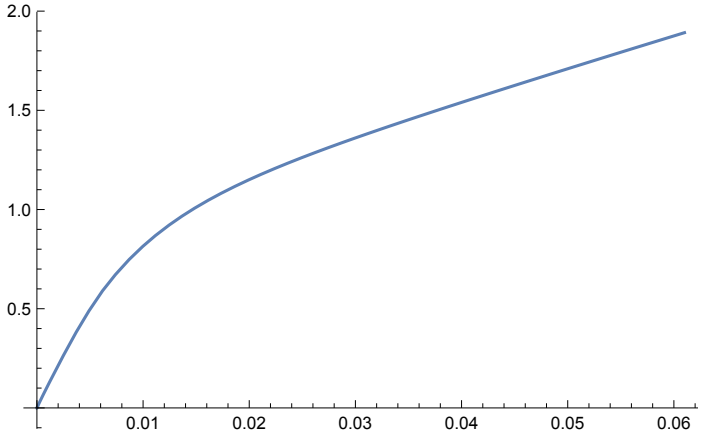
---------- Ca = 2.92648

uM ----------





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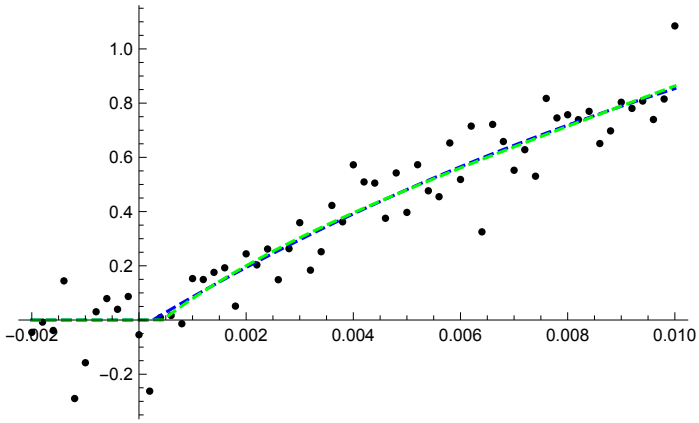


```
Mono: chi2 = 0.629337     d = 0.629337     a = 1.85073     t = 0.015754

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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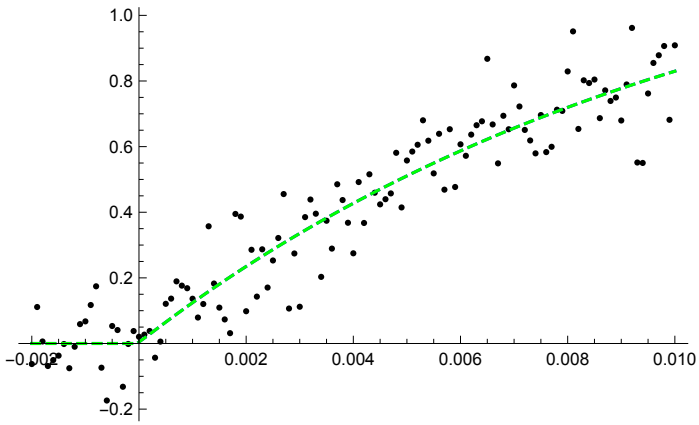


```
Mono: chi2 = 1.10867     d = 1.10867     a = 1.36916     t = 0.0107601
Bi: ratio chi2Mono/chi2Bi = 1.00003     d = -0.0000247266
      a = 1.04485     a1 = 1.37968     t1 =0.010811     t2 = 0.806735
Long trace was used for fitting.
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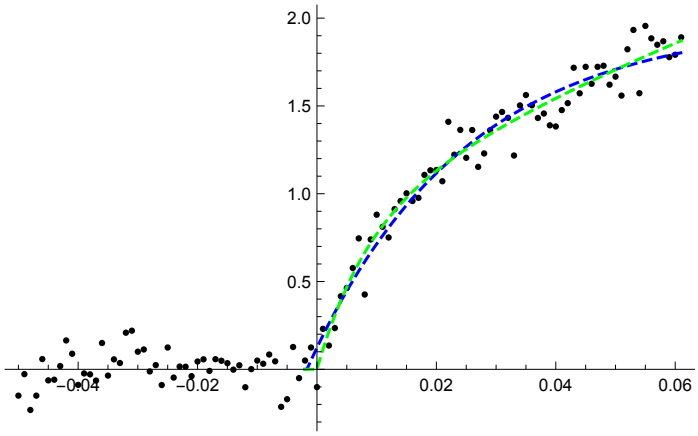

Mono: chi2 = 1.18931 d = -0.00167959 a = 1.98374 t = 0.0261751

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

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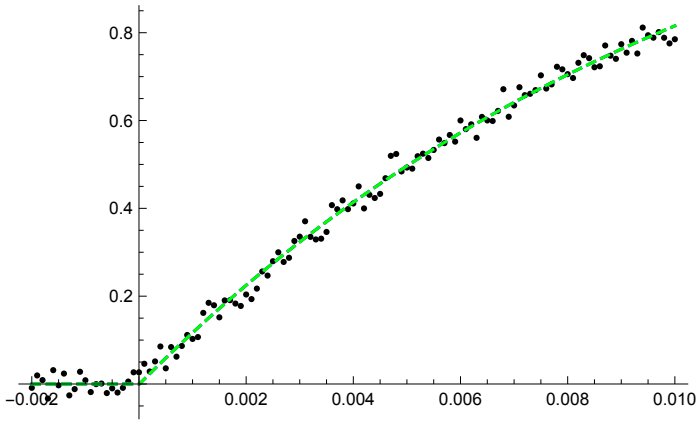

Mono: chi2 = 0.0486792 d = 0.0486792 a = 1.38532 t = 0.0112464

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

Long trace was used for fitting.

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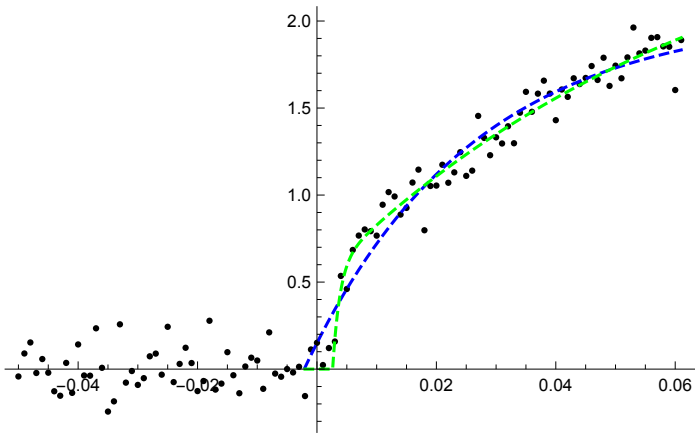


```
Mono: chi2 = 1.47438     d = -0.00212854     a = 2.04811     t = 0.0279774
Bi: ratio chi2Mono/chi2Bi = 1.20677     d = 0.0026256     a =
 2.84719     a1 = 0.593898     t1 =0.0011885     t2 = 0.0670262
-------------------------------------------------------------------------------------
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```
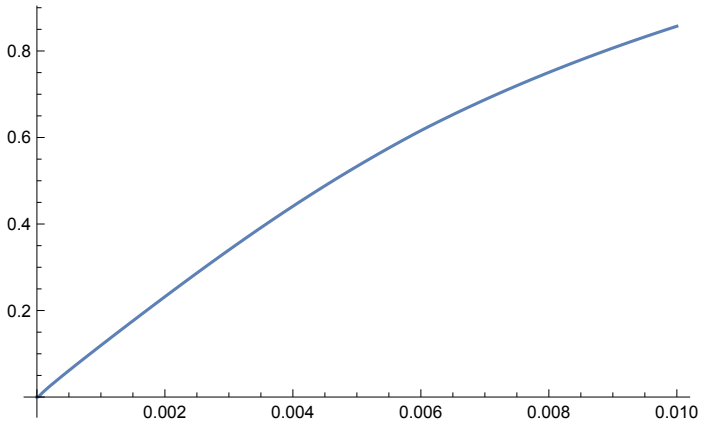
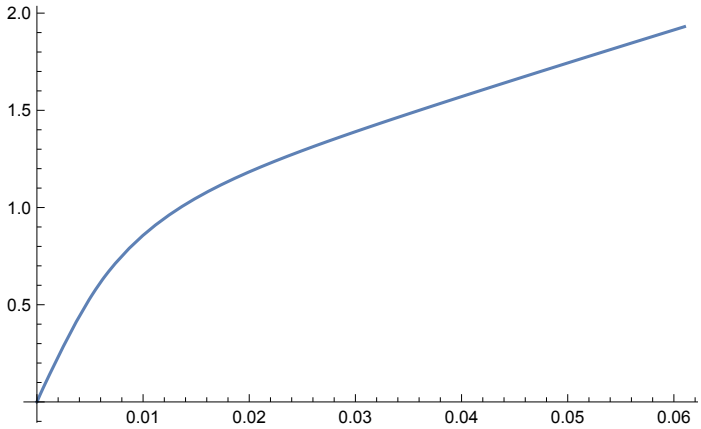

---------- Ca = 3.0905
uM ----------





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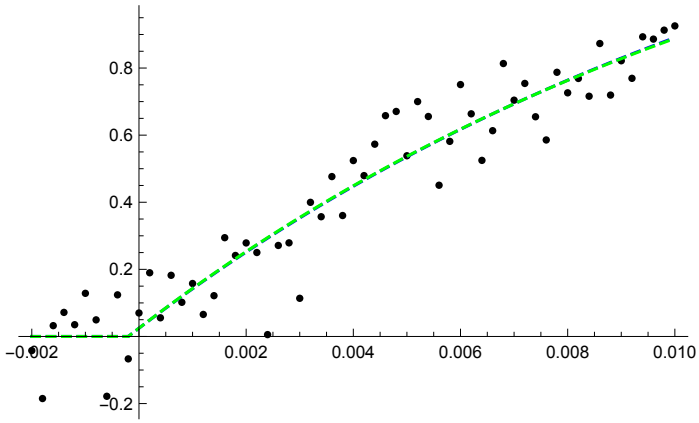


```
Mono: chi2 = 0.549021     d = 0.549021     a = 1.69807     t = 0.0137231

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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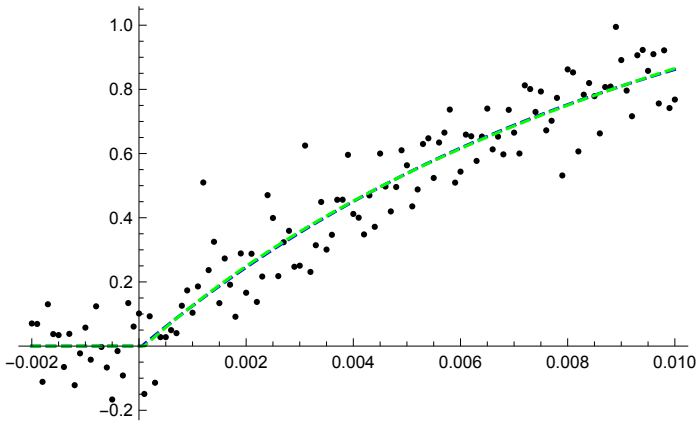


```
Mono: chi2 = 1.05721     d = 1.05721     a = 1.33425     t = 0.00957358
Bi: ratio chi2Mono/chi2Bi = 1.002     d = 0.0001     a =
 1.60116     a1 = 0.143059     t1 =0.00294497     t2 = 0.014344
Long trace was used for fitting.
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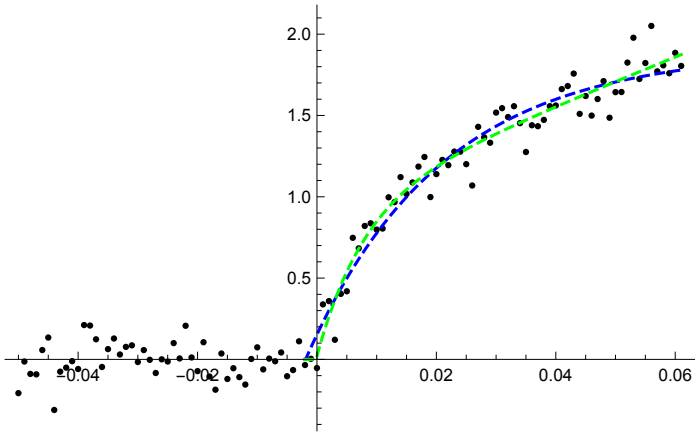


```
Mono: chi2 = 1.39978     d = -0.00190016     a = 1.89679     t = 0.022612
Bi: ratio chi2Mono/chi2Bi = 1.1312     d = -0.000138827     a =
 24.1376     a1 = 0.937504     t1 =0.00762443     t2 = 1.48275
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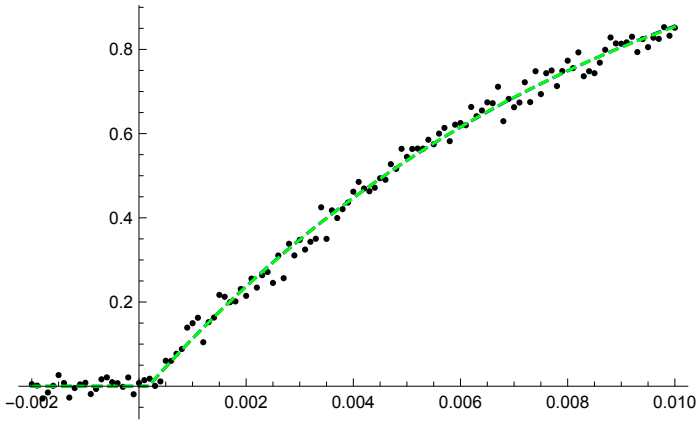


```
Mono: chi2 = 0.0542844     d = 0.0542844     a = 1.27791     t = 0.00886637
Bi: ratio chi2Mono/chi2Bi = 1.01047     d = 0.000171819     a =
 0.769133     a1 = 2.24888     t1 =0.0115288     t2 = 0.0281517
Long trace was used for fitting.
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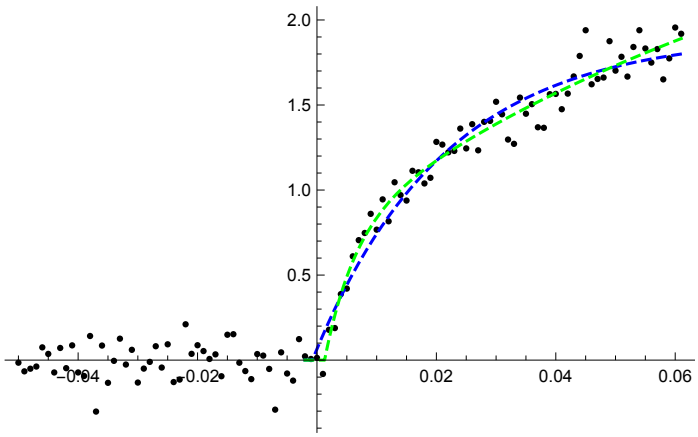


```
Mono: chi2 = 1.25624     d = -0.000759105     a = 1.9141     t = 0.0219203
Bi: ratio chi2Mono/chi2Bi = 1.21575     d = 0.00127703     a =
 3.14407     a1 = 0.75118     t1 =0.00497846     t2 = 0.0923854
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```

---------- Ca = 3.26357

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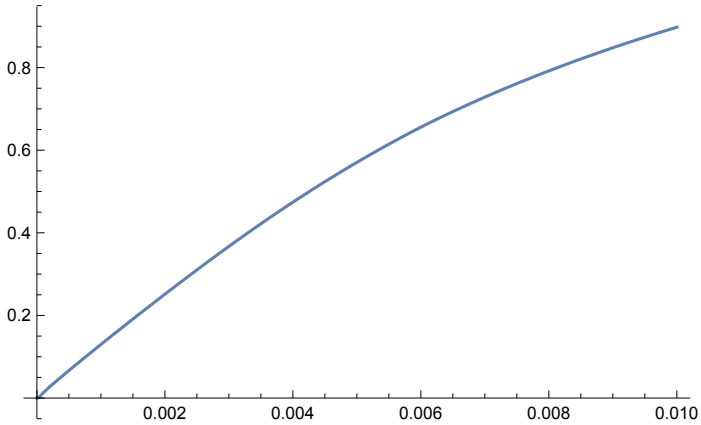

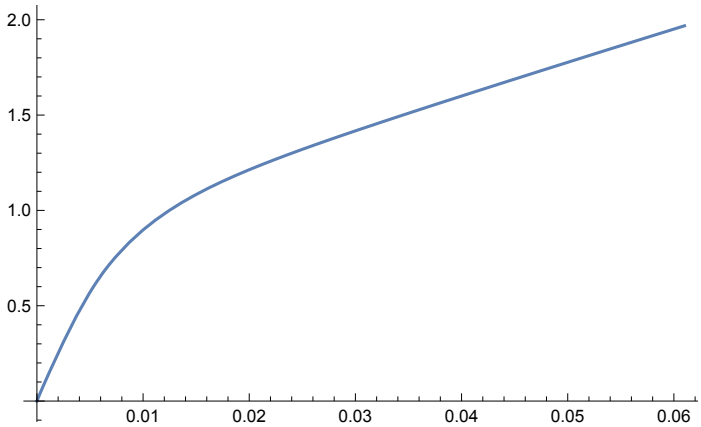

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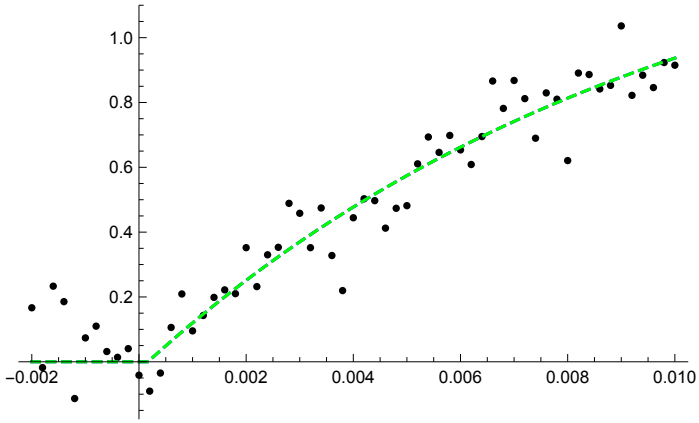


```
Mono: chi2 = 0.479379     d = 0.479379     a = 1.49101     t = 0.00993266

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

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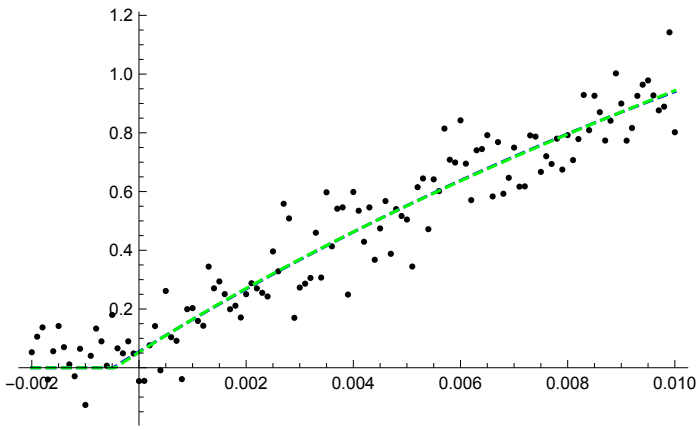


```
Mono: chi2 = 1.06369     d = 1.06369     a = 2.32437     t = 0.0202107
Bi: ratio chi2Mono/chi2Bi = 1.00031     d = -0.000444716     a =
 18.099     a1 = 0.401364     t1 =0.00682913     t2 = 0.288459
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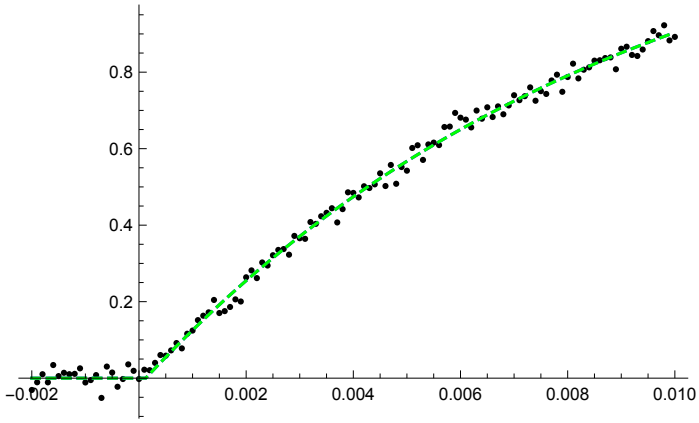


```
Mono: chi2 = 0.0439972     d = 0.0439972     a = 1.35645     t = 0.00899939
Bi: ratio chi2Mono/chi2Bi = 1.00021     d = 0.00012636     a =
 1.13266     a1 = 1.36662     t1 =0.00904317     t2 = 0.518174
--------------------------------------------------------------------------------
  -------------------------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

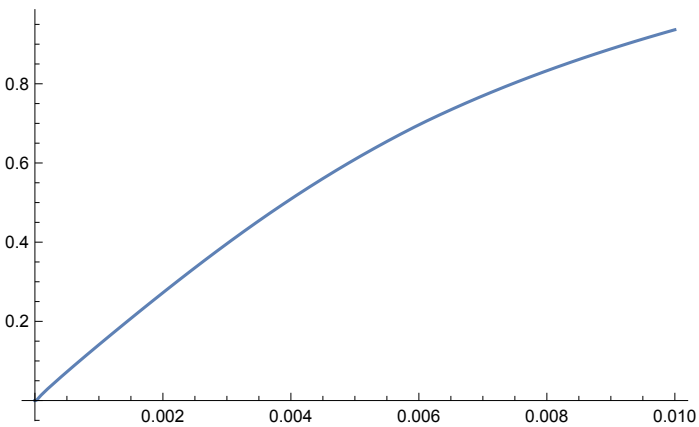

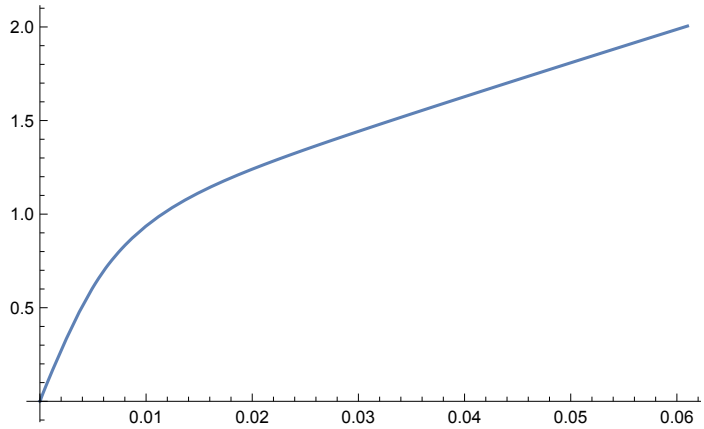

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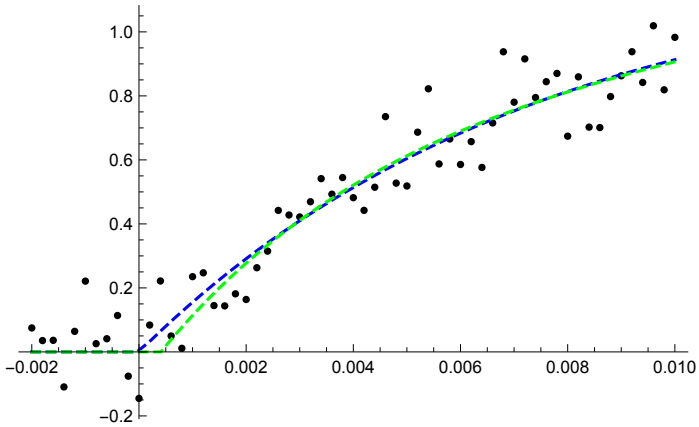


```
Mono: chi2 = 0.516618     d = 0.516618     a = 1.23478     t = 0.00743549
Bi: ratio chi2Mono/chi2Bi = 0.968003     d = 0.000408289     a =
 6.05034     a1 = 0.737791     t1 =0.00410542     t2 = 0.207591
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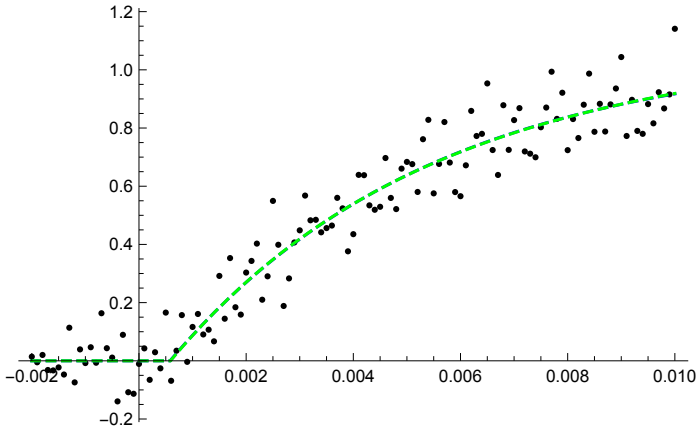


```
Mono: chi2 = 0.903365     d = 0.903365     a = 1.07561     t = 0.00491516
Bi: ratio chi2Mono/chi2Bi = 1.00003     d = 0.000587614     a =
 1.92331     a1 = 1.00067     t1 =0.00464036     t2 = 0.170049
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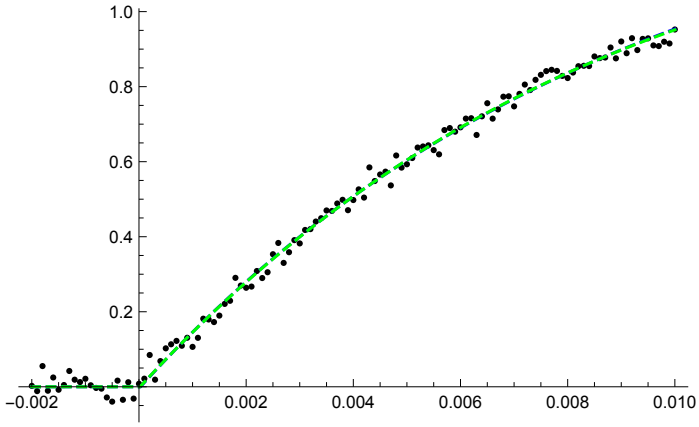

```
Mono: chi2 = 0.052497     d = 0.052497     a = 1.42602     t = 0.00902549
Bi: ratio chi2Mono/chi2Bi = 1.01697     d = 0.0000199365     a =
 0.709506     a1 = 2.98546     t1 =0.0125773     t2 = 0.0279271
-------------------------------------------------------------------------------------
  -------------------------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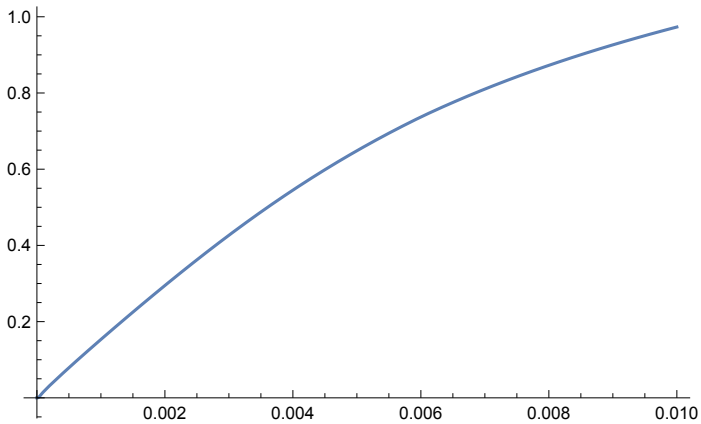

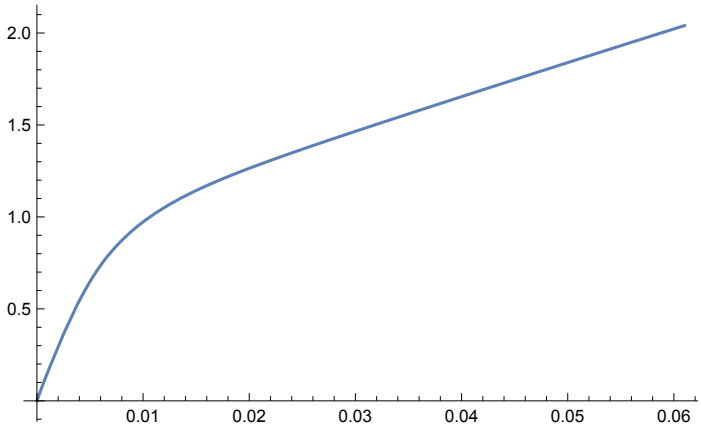


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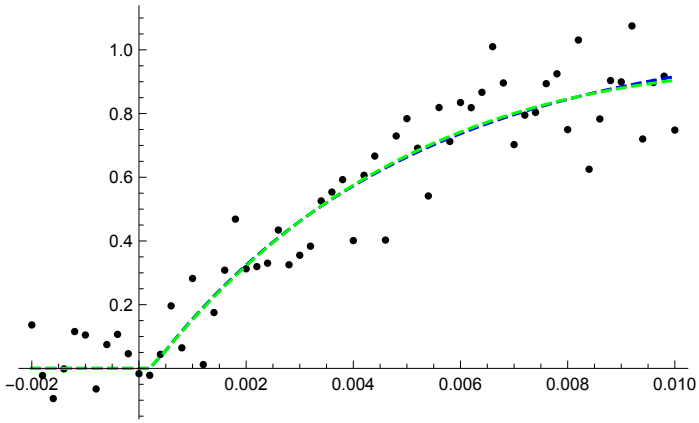


```
Mono: chi2 = 0.673273     d = 0.673273     a = 1.053     t = 0.00478755

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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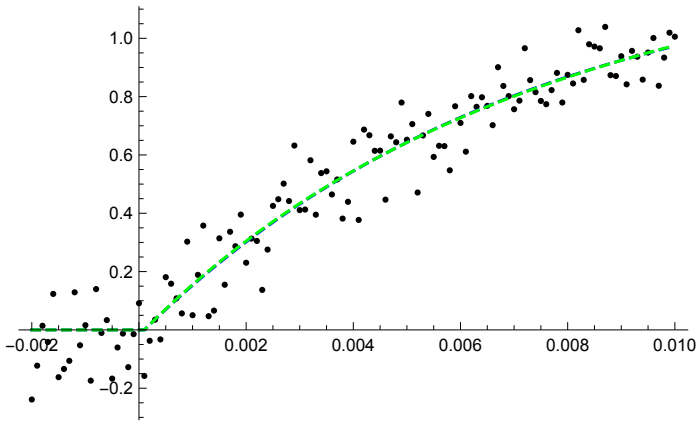


```
Mono: chi2 = 1.0446     d = 1.0446     a = 1.30374     t = 0.00720949
Bi: ratio chi2Mono/chi2Bi = 1.00044     d = 0.0001     a =
 1.59116     a1 = 0.839513     t1 =0.00563975     t2 = 0.0211732
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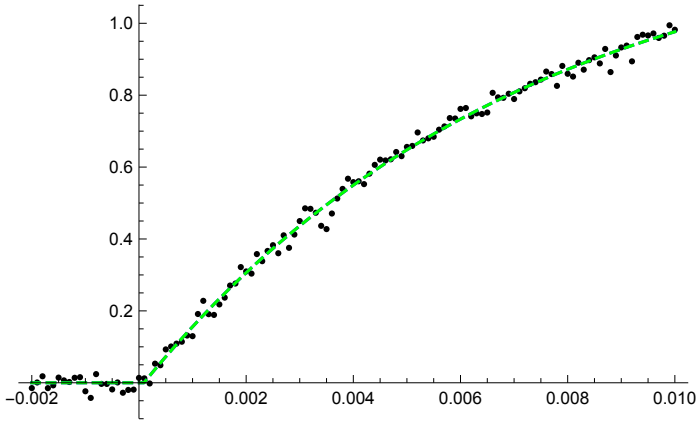
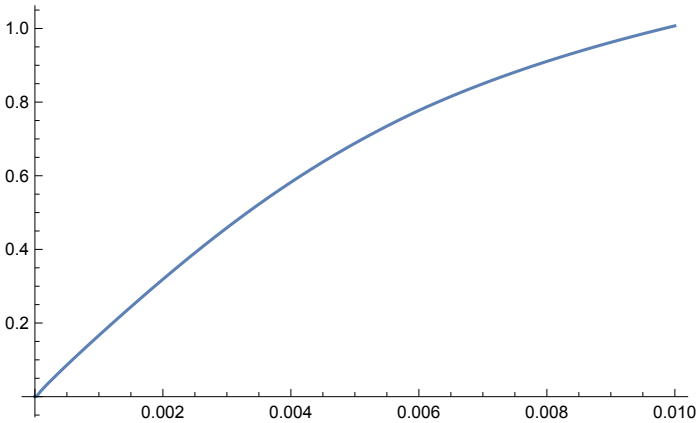
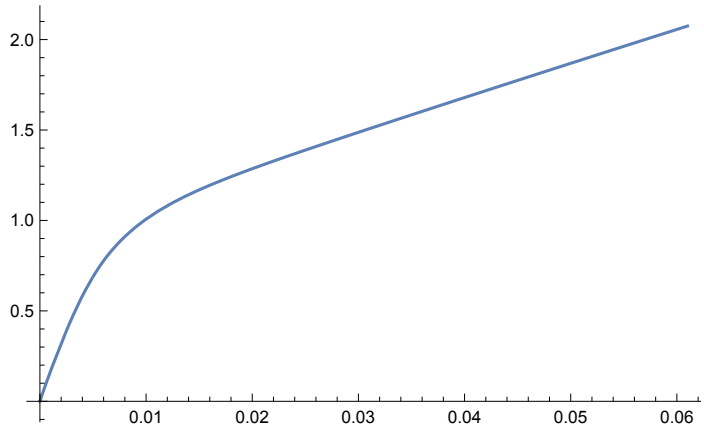



```
Mono: chi2 = 0.0440079     d = 0.0440079     a = 1.29659     t = 0.0070838
Bi: ratio chi2Mono/chi2Bi = 0.99999     d = 0.0000921285     a =
 1.32029     a1 = 1.29536     t1 =0.00707935     t2 = 0.400071
------------------------------------------------------------------------------------
  -------------------------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





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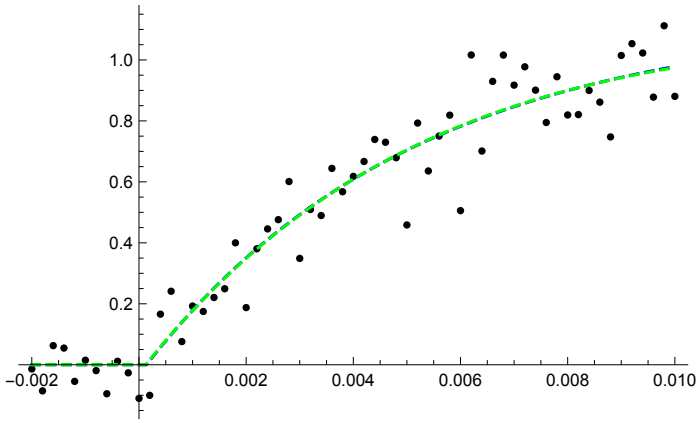


```
Mono: chi2 = 0.591074     d = 0.591074     a = 1.14127     t = 0.00506584
Bi: ratio chi2Mono/chi2Bi = 1.00079     d = 0.000127754     a =
 0.82583     a1 = 1.45551     t1 =0.00591516     t2 = 0.0248454
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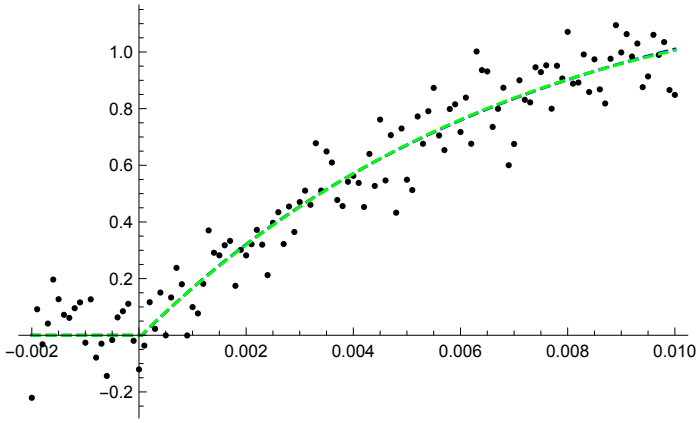


```
Mono: chi2 = 1.07686     d = 1.07686     a = 1.34343     t = 0.00713836
Bi: ratio chi2Mono/chi2Bi = 1.00286     d = 0.0000416563     a =
 0.587823     a1 = 3.09673     t1 =0.0105023     t2 = 0.0226827
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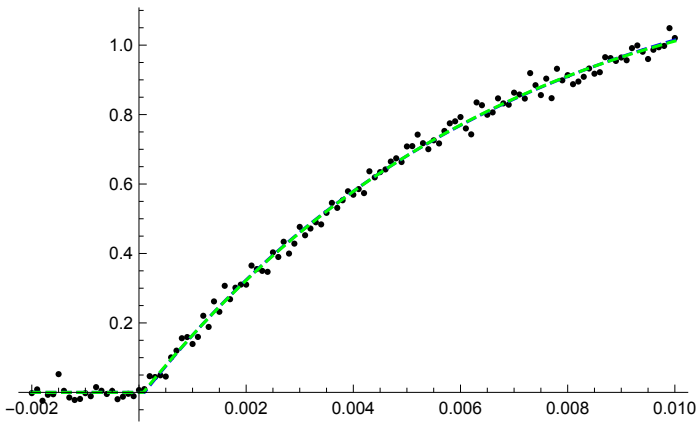

```
Mono: chi2 = 0.0474997     d = 0.0474997     a = 1.31718     t = 0.006726
Bi: ratio chi2Mono/chi2Bi = 1.01223     d = 0.0000818084     a =
 0.788786     a1 = 2.42118     t1 =0.00911816     t2 = 0.0219413
-------------------------------------------------------------------------------------
  --------------------------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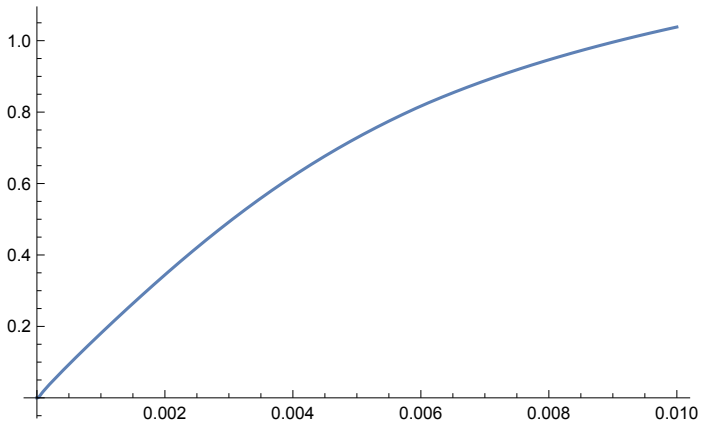

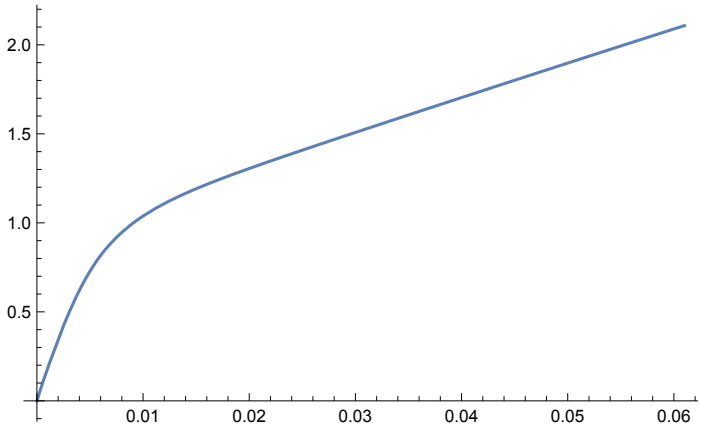


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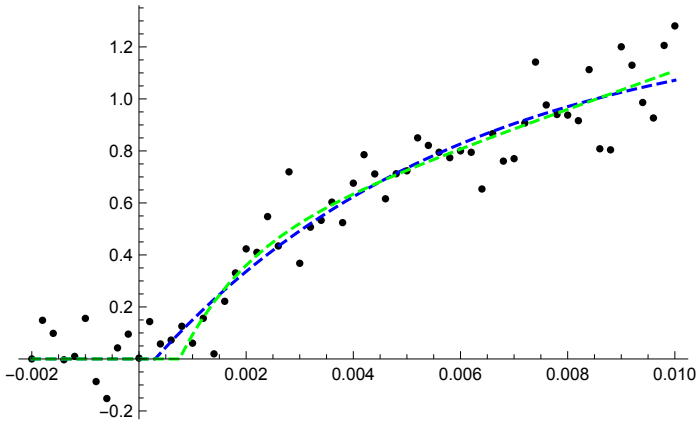


```
Mono: chi2 = 0.688203     d = 0.688203     a = 1.31499     t = 0.00575031

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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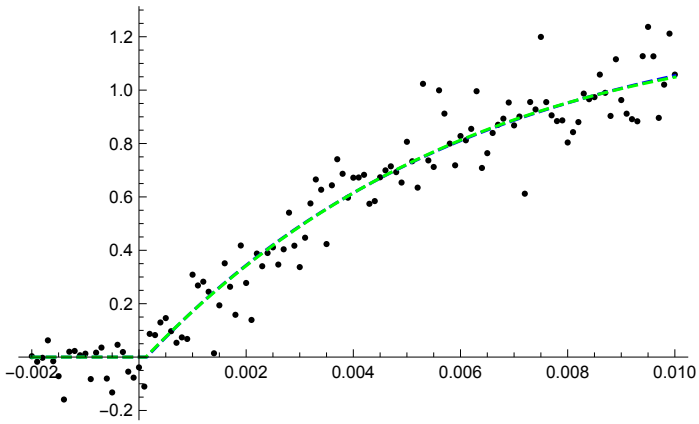


```
Mono: chi2 = 1.09088     d = 1.09088     a = 1.31867     t = 0.00613874
Bi: ratio chi2Mono/chi2Bi = 1.00209     d = 0.000128849     a =
 0.715615     a1 = 2.77921     t1 =0.00878736     t2 = 0.0192792
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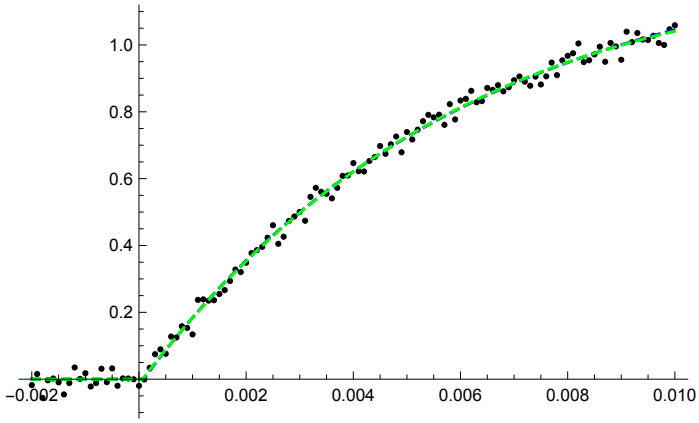
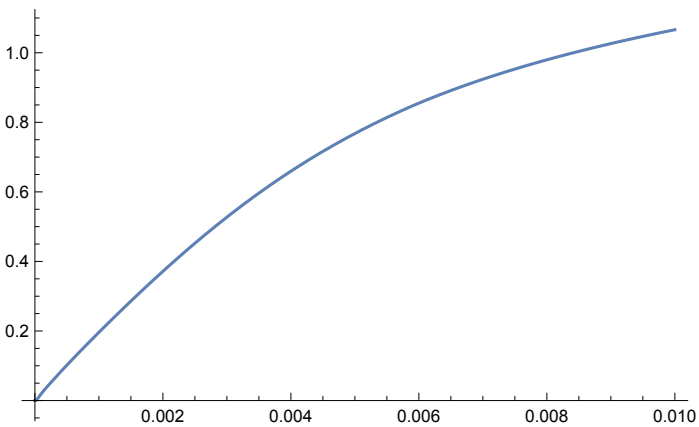
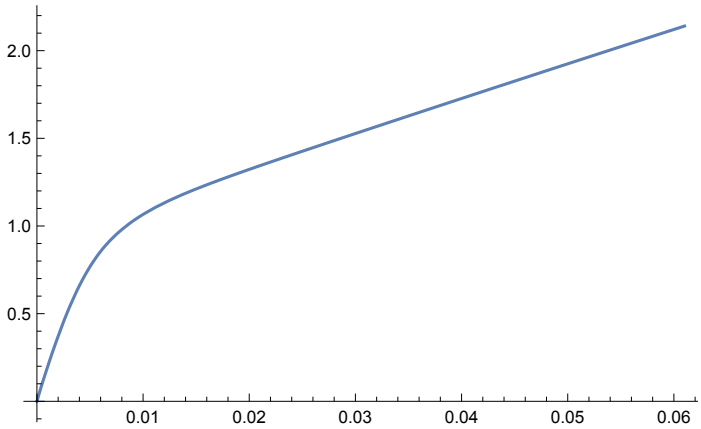



```
Mono: chi2 = 0.0536998     d = 0.0536998     a = 1.28851     t = 0.0059541
Bi: ratio chi2Mono/chi2Bi = 1.01579     d = 0.0000682151     a =
 0.87054     a1 = 2.07324     t1 =0.00765684     t2 = 0.0202902
------------------------------------------------------------------------------------
  -------------------------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





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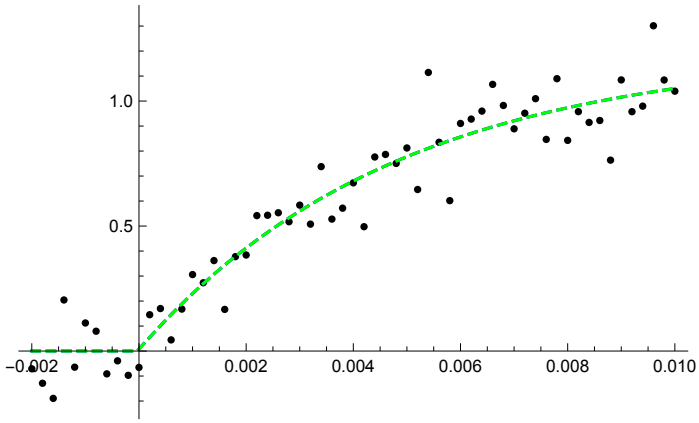


```
Mono: chi2 = 0.741104     d = 0.741104     a = 1.19933     t = 0.00480927
Bi: ratio chi2Mono/chi2Bi = 1.     d = -0.0000251194     a =
 1.19933     a1 = 0.764478     t1 =0.00480927     t2 = 0.00480927
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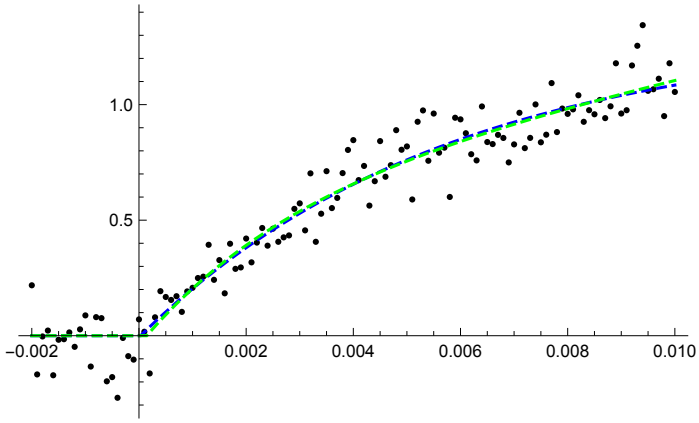


```
Mono: chi2 = 1.22504     d = 1.22504     a = 1.31978     t = 0.0057828
Bi: ratio chi2Mono/chi2Bi = 1.00843     d = 0.000145499     a =
 16.5551     a1 = 0.612851     t1 =0.00283772     t2 = 0.302812
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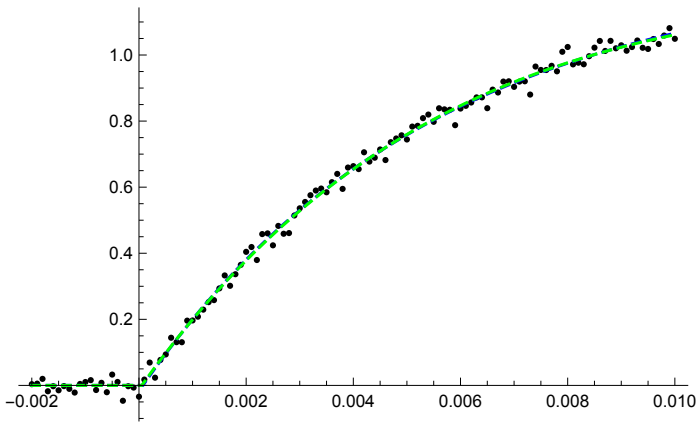
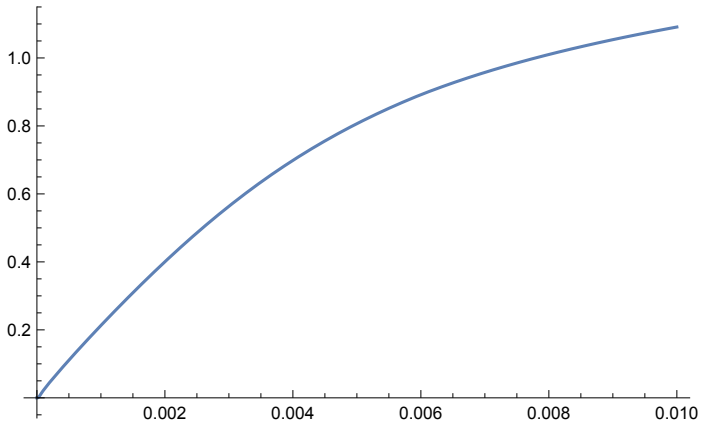
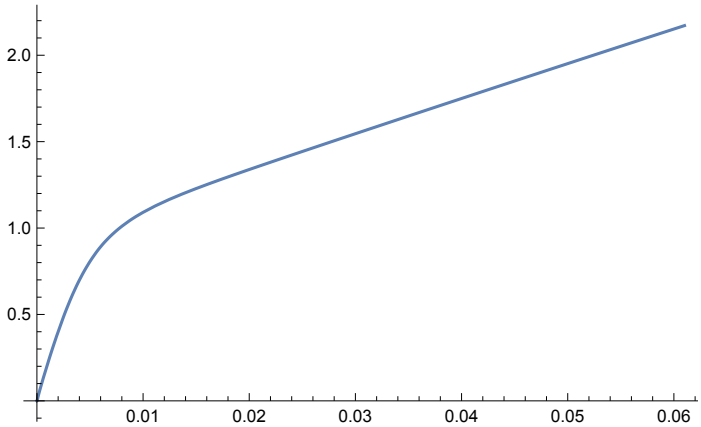


```
Mono: chi2 = 0.0481713     d = 0.0481713     a = 1.26719     t = 0.00539622
Bi: ratio chi2Mono/chi2Bi = 1.00775     d = 0.0000528356     a =
 0.86805     a1 = 2.3336     t1 =0.00734468     t2 = 0.0162774
-------------------------------------------------------------------------------------
  -------------------------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



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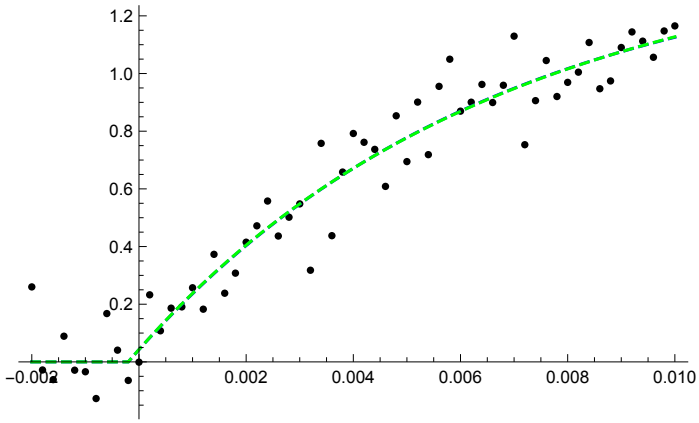


```
Mono: chi2 = 0.581761     d = 0.581761     a = 1.43801     t = 0.00667814

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

------------------------------------------------------------------------ C10

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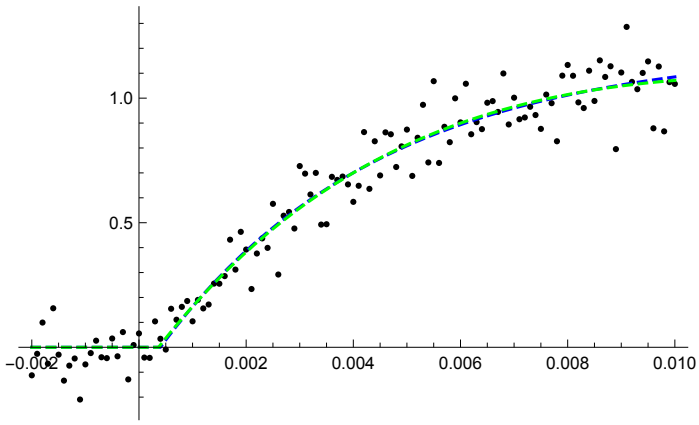


```
Mono: chi2 = 1.00321     d = 1.00321     a = 1.20211     t = 0.00412005
Bi: ratio chi2Mono/chi2Bi = 1.00983     d = 0.000365304     a =
 0.470647     a1 = 3.14074     t1 =0.00682054     t2 = 0.014364
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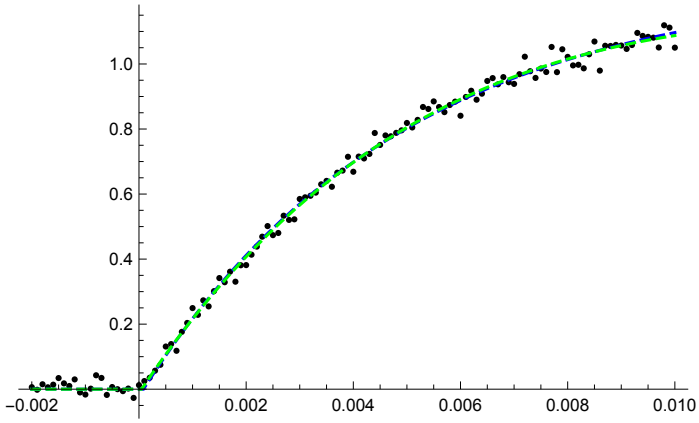


```
Mono: chi2 = 0.0562588     d = 0.0562588     a = 1.25907     t = 0.00484437
Bi: ratio chi2Mono/chi2Bi = 1.03489     d = 0.0000495541     a =
 0.576644     a1 = 3.12659     t1 =0.00768791     t2 = 0.0159721
------------------------------------------------------------------------------------
  -------------------------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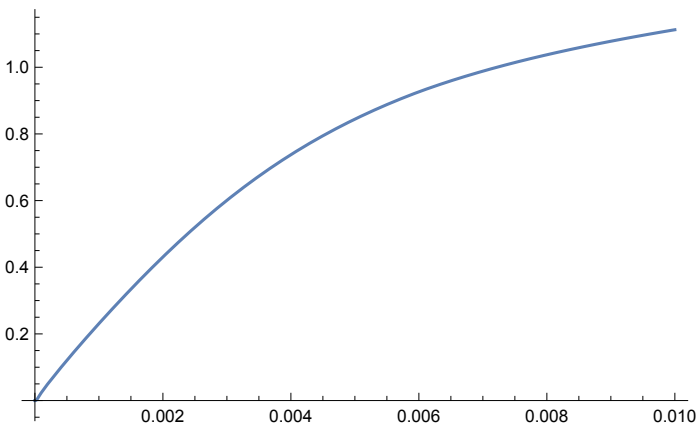

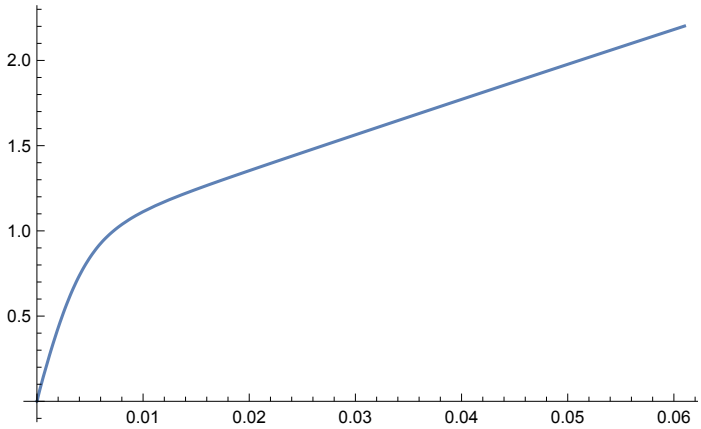

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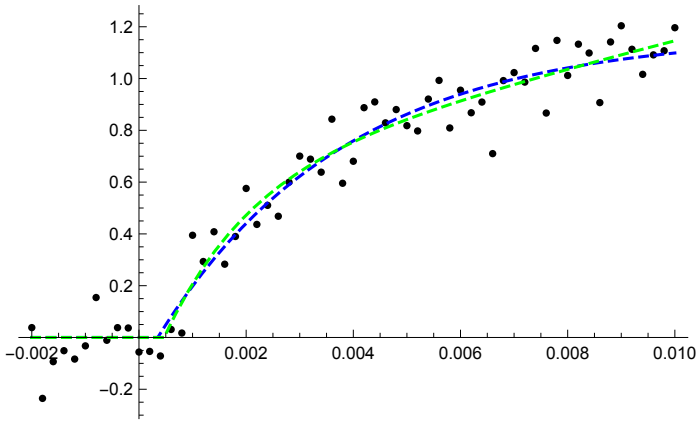


```
Mono: chi2 = 0.526459     d = 0.526459     a = 1.17314     t = 0.00350019
Bi: ratio chi2Mono/chi2Bi = 1.05083     d = 0.000471546     a =
 7.31476     a1 = 0.622415     t1 =0.00158251     t2 = 0.116659
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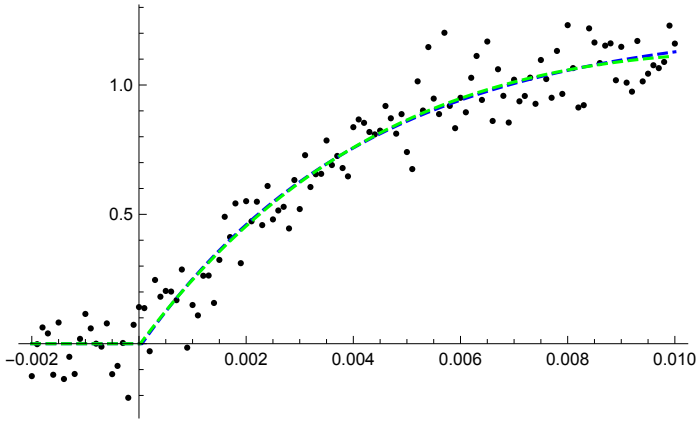


```
Mono: chi2 = 1.14165     d = 1.14165     a = 1.24623     t = 0.00422023
Bi: ratio chi2Mono/chi2Bi = 1.01319     d = 0.0000241319     a =
 0.488193     a1 = 3.43221     t1 =0.00708073     t2 = 0.0142567
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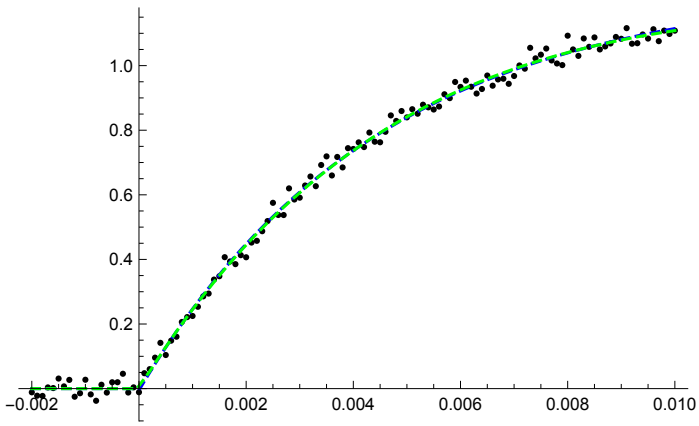
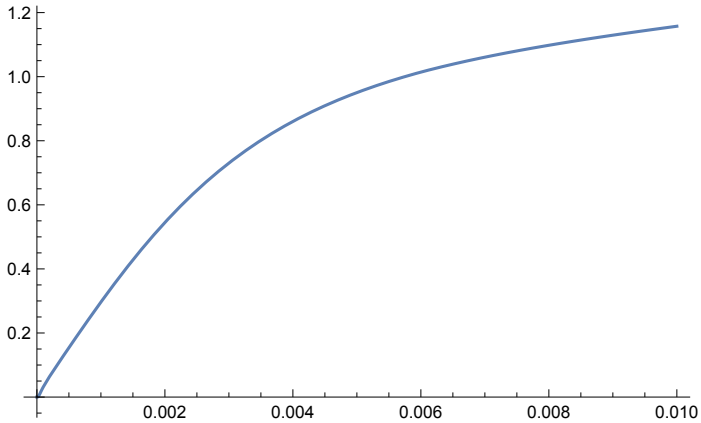


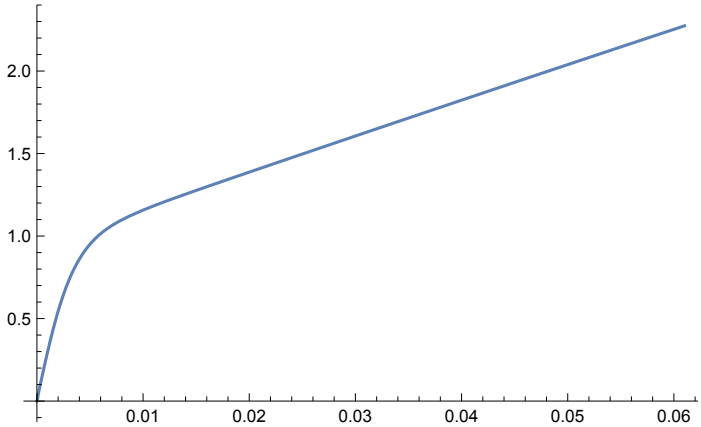
Mono: chi2 = 0.0562464 d = 0.0562464 a = 1.24749 t = 0.00445761

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

---------- Ca = 5.53376

uM ----------





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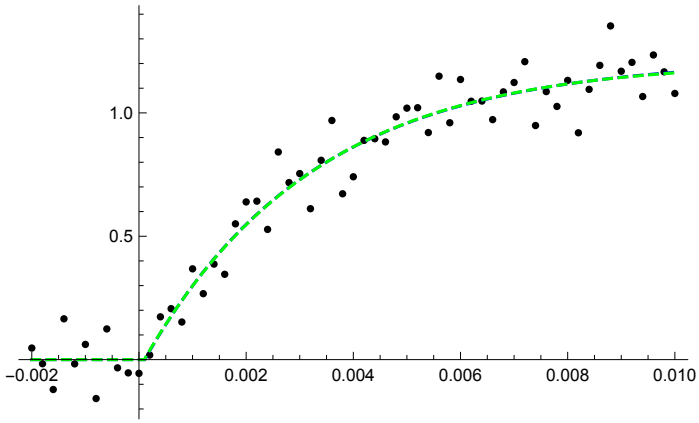


```
Mono: chi2 = 0.498816     d = 0.498816     a = 1.21781     t = 0.00316471

Bi: ratio chi2Mono/chi2Bi = 1.00011     d = 0.0000990186     a =
 1.19834     a1 = 1.59337     t1 =0.00348598     t2 = 0.00511491

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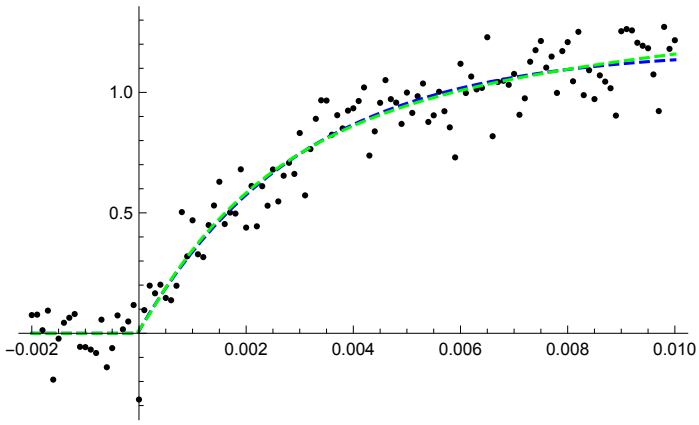

Mono: chi2 = 1.26227 d = 1.26227 a = 1.17808 t = 0.00302333

Bi: ratio chi2Mono/chi2Bi = 1.00985 d = 6.31251×10^{-18}

a = 4.37205 a1 = 0.948605 t1 =0.00239877 t2 = 0.1471

---------- D

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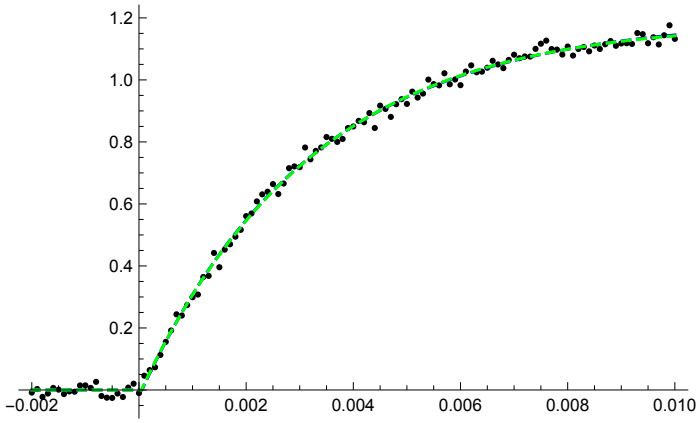
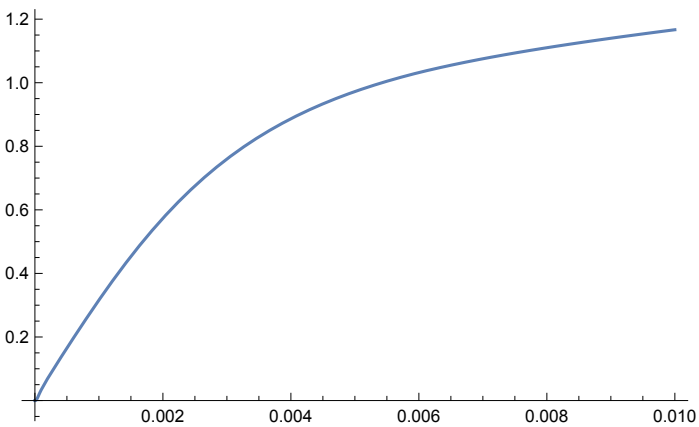
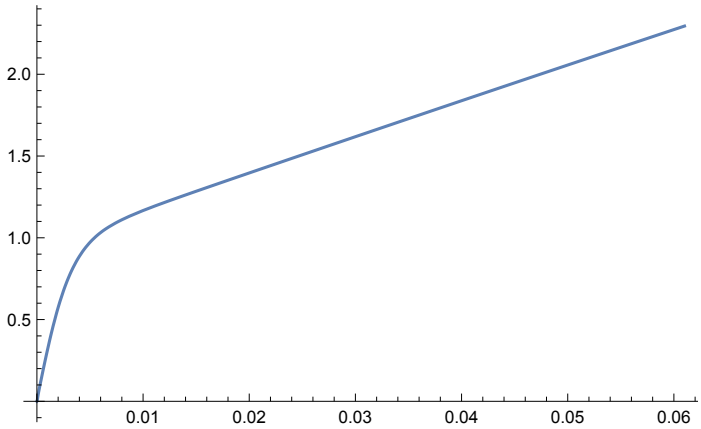



```
Mono: chi2 = 0.0358435     d = 0.0358435     a = 1.19729     t = 0.00317982
Bi: ratio chi2Mono/chi2Bi = 1.00373     d = 0.0000466225     a =
 1.12777     a1 = 1.27604     t1 =0.00335267     t2 = 0.0160725
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 5.7741
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```





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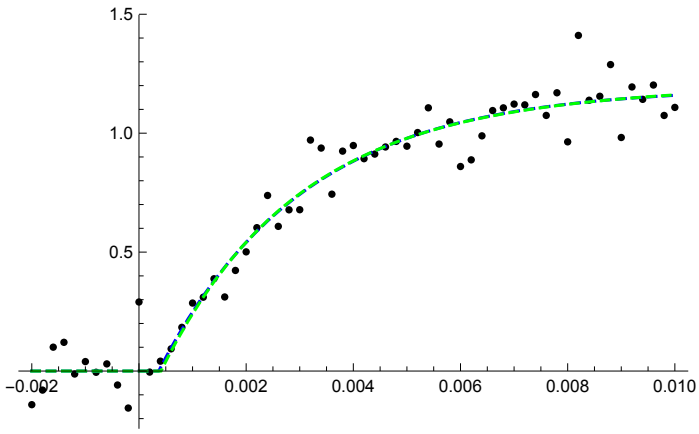


```
Mono: chi2 = 0.545543     d = 0.545543     a = 1.19266     t = 0.00269632
Bi: ratio chi2Mono/chi2Bi = 0.999179     d = 0.000410875     a =
 1.22678     a1 = 1.09364     t1 =0.00246634     t2 = 0.00857543
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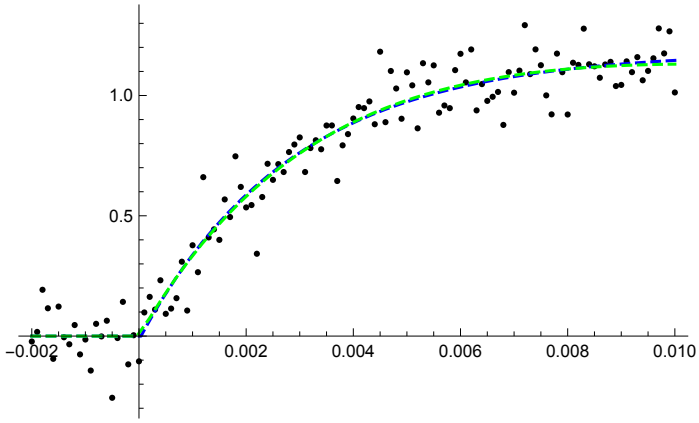

Mono: chi2 = 1.1711 d = 1.1711 a = 1.18217 t = 0.00285888

Bi: ratio chi2Mono/chi2Bi = 1.00579 d = -6.38171×10^{-16} a = 0.950468 a1 = 1.8495 t1 =0.00384944 t2 = 0.00960875

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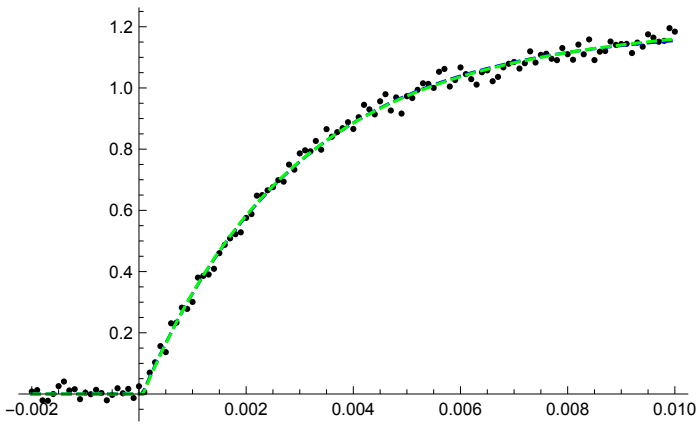

```
Mono: chi2 = 0.0494033     d = 0.0494033     a = 1.19356     t = 0.00290234
Bi: ratio chi2Mono/chi2Bi = 1.00946     d = 0.0000762235     a =
 3.22485     a1 = 1.12928     t1 =0.00272742     t2 = 0.340926
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 6.02652
  uM         -------------------------------------------------------
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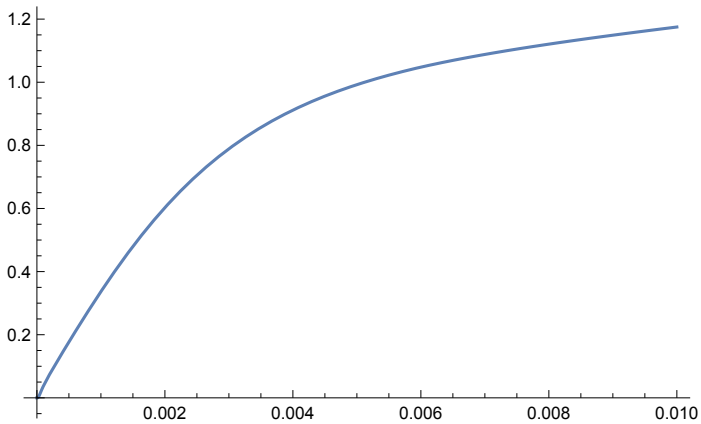
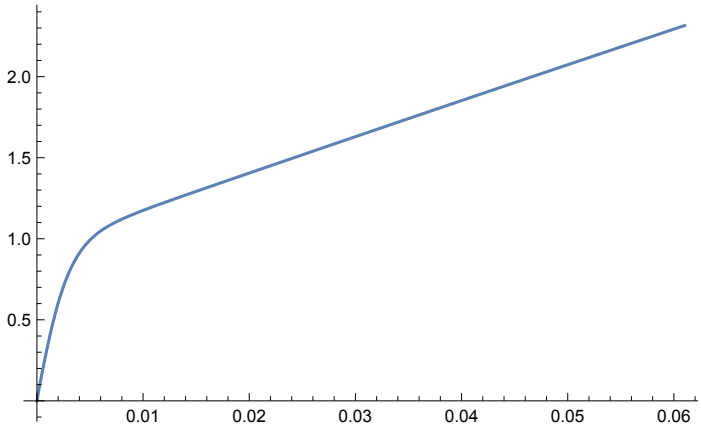
  --------------------------
```



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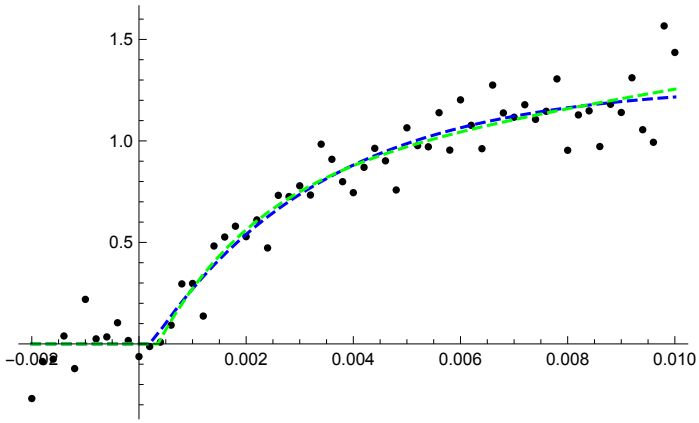


```
Mono: chi2 = 0.854975     d = 0.854975     a = 1.27813     t = 0.00322511

Bi: ratio chi2Mono/chi2Bi = 1.02075     d = 0.000354098     a =
 11.3944     a1 = 0.82962     t1 =0.00185615     t2 = 0.232144

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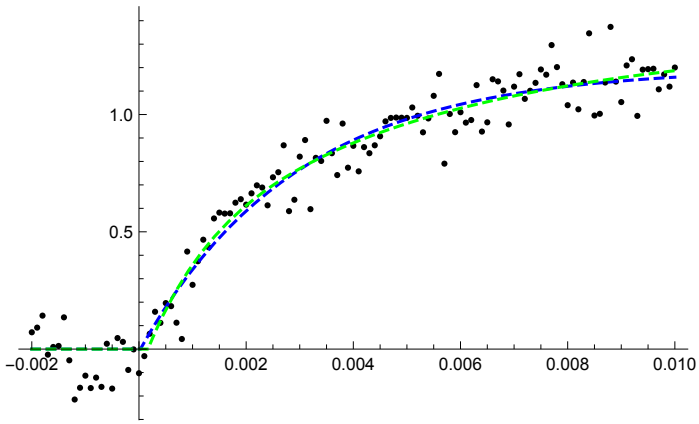


```
Mono: chi2 = 1.07918     d = 1.07918     a = 1.19839     t = 0.00291863
Bi: ratio chi2Mono/chi2Bi = 1.03156     d = 0.000168529     a =
 1.32732     a1 = 0.429296     t1 =0.00108719     t2 = 0.00529719
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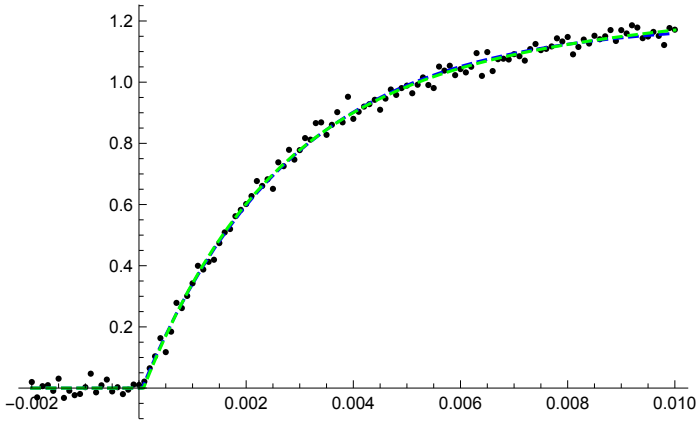


```
Mono: chi2 = 0.057454     d = 0.057454     a = 1.19376     t = 0.00279582
Bi: ratio chi2Mono/chi2Bi = 1.03657     d = 0.0000857027     a =
 3.04923     a1 = 1.07336     t1 =0.00246712     t2 = 0.163573
------------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 6.29189
  uM         -------------------------------------------------------
------------------------------------------------------------------------------------------
  -------------------------
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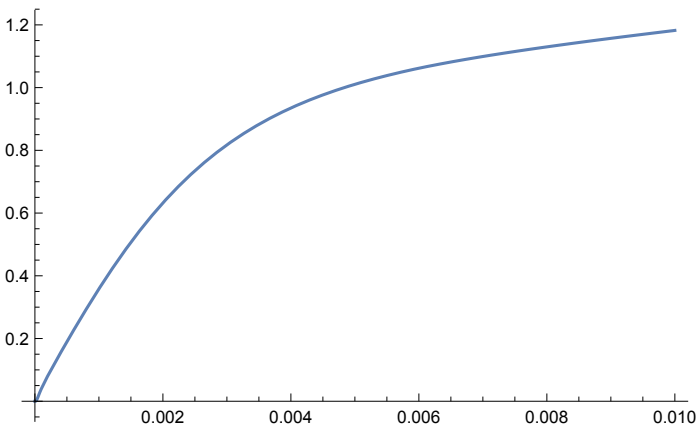

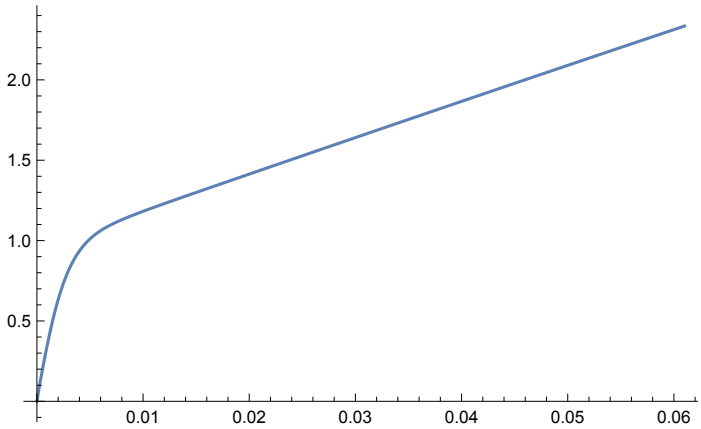

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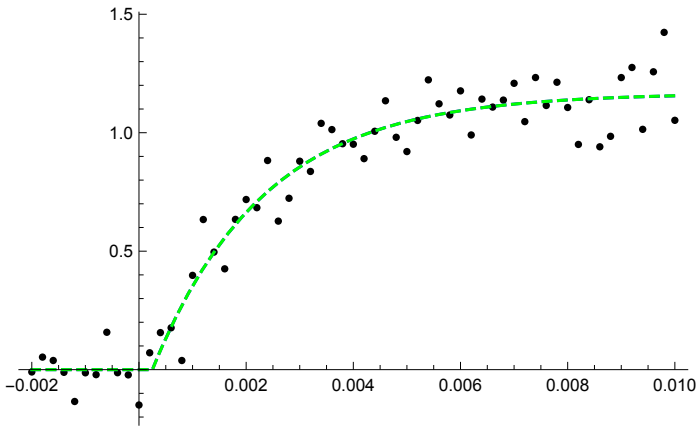


```
Mono: chi2 = 0.64262     d = 0.64262     a = 1.16628     t = 0.00207945
Bi: ratio chi2Mono/chi2Bi = 1.     d = 0.000251219     a =
 1.57499     a1 = 1.16288     t1 =0.00207098     t2 = 1.09783
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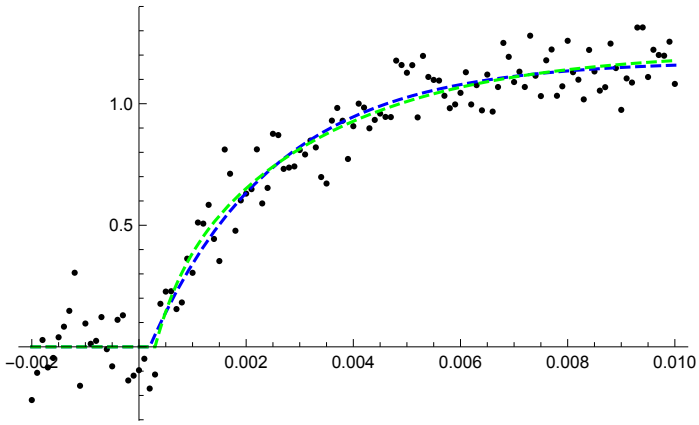


```
Mono: chi2 = 1.24632     d = 1.24632     a = 1.17589     t = 0.00232707
Bi: ratio chi2Mono/chi2Bi = 1.02458     d = 0.0003     a =
 1.21761     a1 = 0.239564     t1 =0.000475914     t2 = 0.00303933
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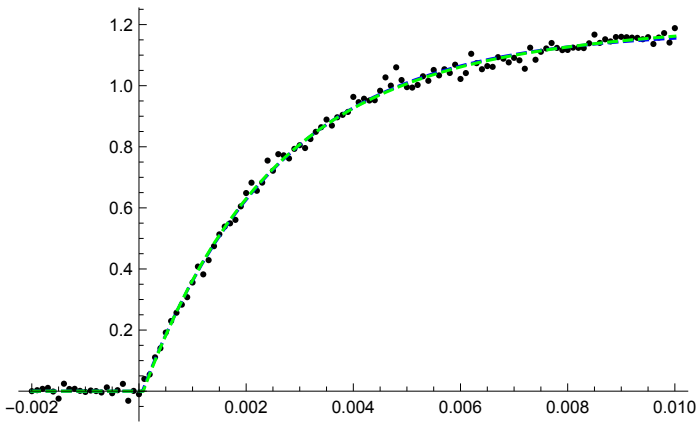

```
Mono: chi2 = 0.0401736     d = 0.0401736     a = 1.17925     t = 0.00254669
Bi: ratio chi2Mono/chi2Bi = 1.01997     d = 0.0000798753     a =
 4.31797     a1 = 1.11681     t1 =0.00238123     t2 = 0.502935
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  --------------------------
----------------     Ca = 6.57096
  uM         -------------------------------------------------------
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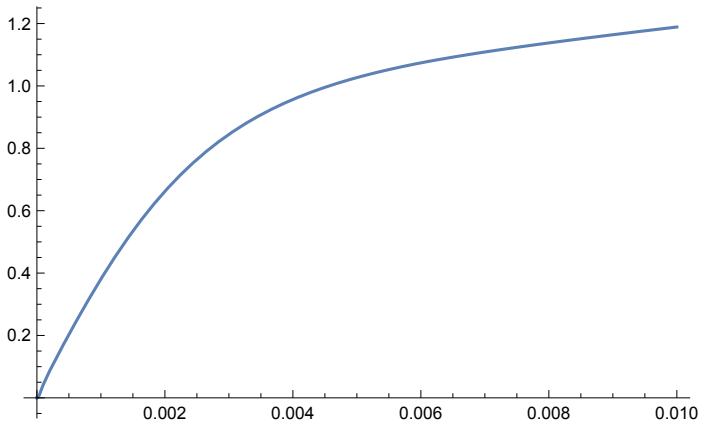

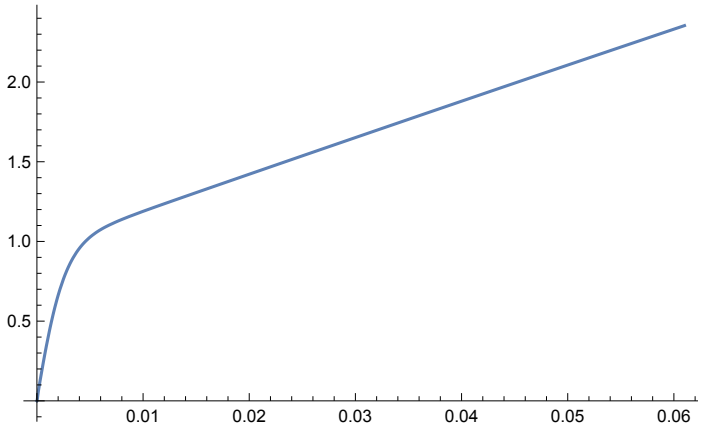


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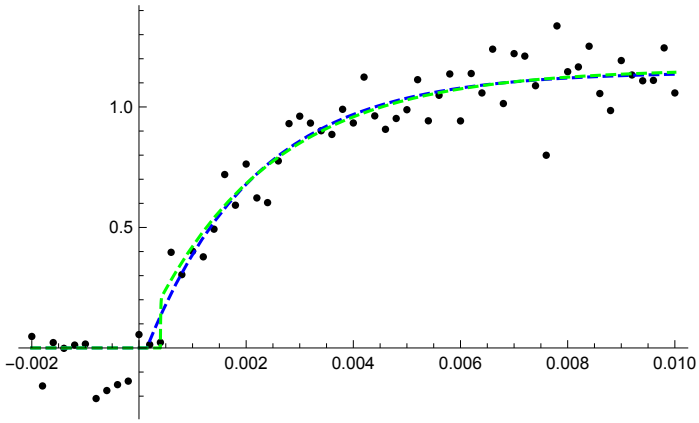

Mono: chi2 = 0.641034 d = 0.641034 a = 1.1453 t = 0.00205907

Bi: ratio chi2Mono/chi2Bi = 1.03423 d = 0.000399321 a = 1.15855 a1 = 0.202108 t1 = 5.71165×10^{-6} t2 = 0.00229652

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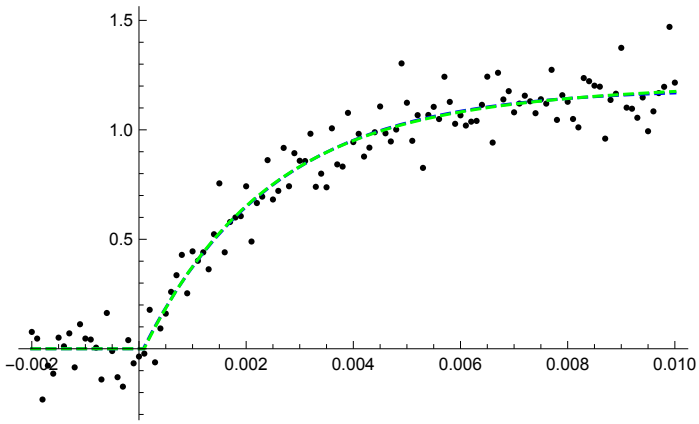


```
Mono: chi2 = 1.18334     d = 1.18334     a = 1.18868     t = 0.00242612
Bi: ratio chi2Mono/chi2Bi = 1.00064     d = 0.0000957586     a =
 2.60611     a1 = 1.13074     t1 =0.00227687     t2 = 0.241953
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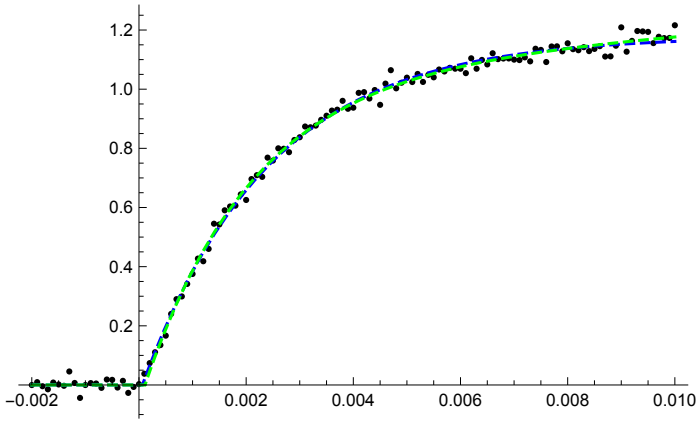


```
Mono: chi2 = 0.0491438     d = 0.0491438     a = 1.17905     t = 0.00236583
Bi: ratio chi2Mono/chi2Bi = 1.08159     d = 0.000112625     a =
 5.05467     a1 = 1.05554     t1 =0.00201876     t2 = 0.301968
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 6.86435
  uM         -------------------------------------------------------
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  -------------------------
```

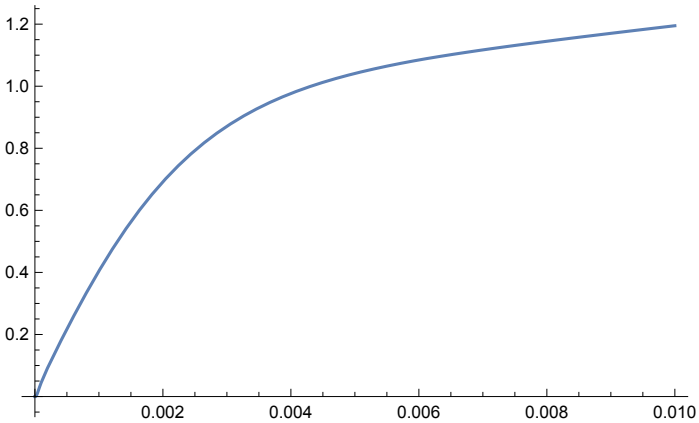

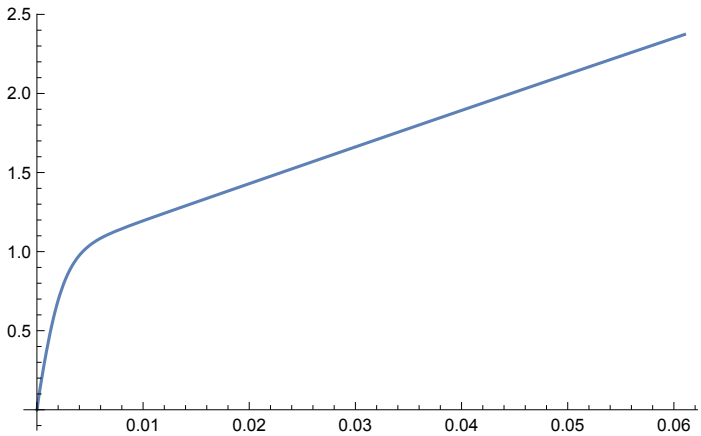

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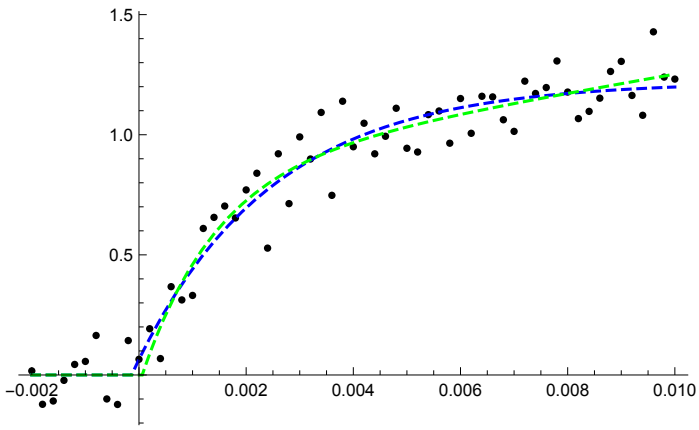


```
Mono: chi2 = 0.652462     d = 0.652462     a = 1.22099     t = 0.00253428
Bi: ratio chi2Mono/chi2Bi = 1.05358     d = 0.0000609326     a =
 11.4907     a1 = 0.857825     t1 =0.00137812     t2 = 0.262535
------------------------------------------------------------------------ C10
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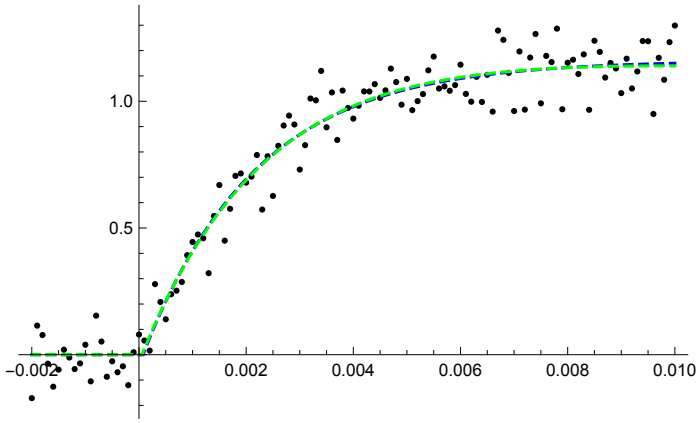


```
Mono: chi2 = 0.923916     d = 0.923916     a = 1.16061     t = 0.00211668
Bi: ratio chi2Mono/chi2Bi = 1.00166     d = 0.0000576844     a =
 1.03581     a1 = 1.27187     t1 =0.00233878     t2 = 0.0150525
------------------------------------------------------------------------- D
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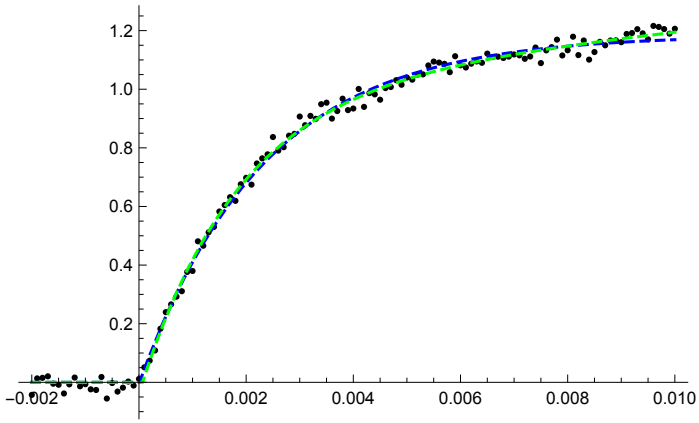
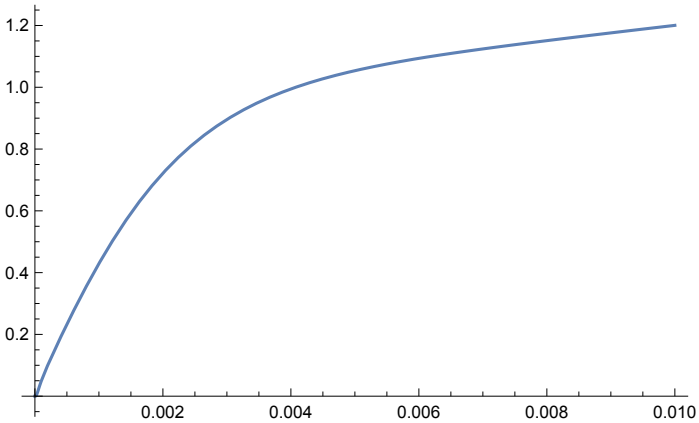


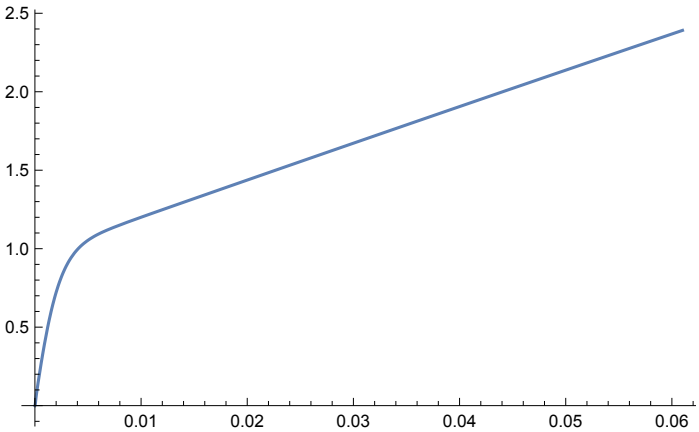
Mono: chi2 = 0.0694139 d = 0.0694139 a = 1.18507 t = 0.00232522

Bi: ratio chi2Mono/chi2Bi = 1.22782 d = 0.0000675524 a = 5.51002 a1 = 1.00519 t1 =0.00183421 t2 = 0.225946

--- Ca = 7.17282

uM ---





--- C5

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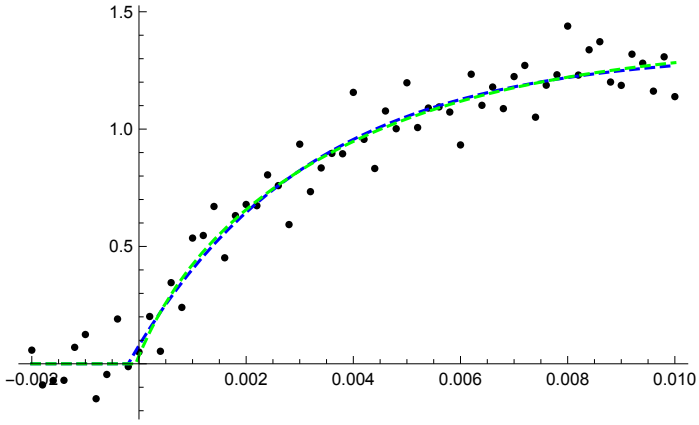


```
Mono: chi2 = 0.594082     d = 0.594082     a = 1.33261     t = 0.00332305
Bi: ratio chi2Mono/chi2Bi = 1.01156     d = -0.000061321     a =
 1.37683     a1 = 0.176659     t1 =0.000665803     t2 = 0.00394644
------------------------------------------------------------------------- C10
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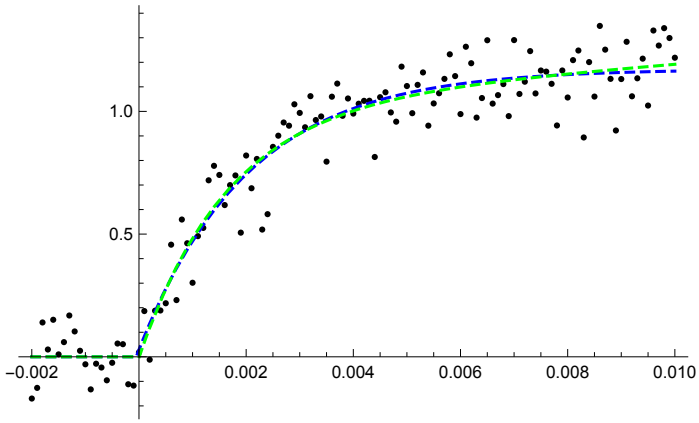

Mono: chi2 = 1.40674 d = 1.40674 a = 1.17246 t = 0.00203782

Bi: ratio chi2Mono/chi2Bi = 1.01113 d = 5.07762×10^{-6}

a = 6.9501 a1 = 1.02071 t1 =0.00163361 t2 = 0.3368

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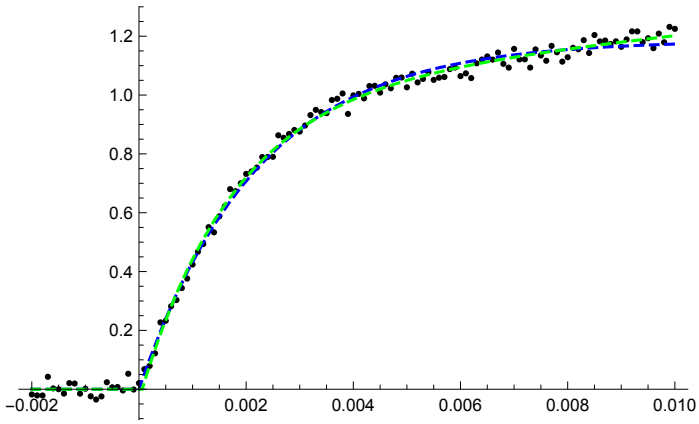


```
Mono: chi2 = 0.0710677     d = 0.0710677     a = 1.18584     t = 0.00219871
Bi: ratio chi2Mono/chi2Bi = 1.30291     d = 0.0000609123
      a = 6.72485     a1 = 1.00823     t1 =0.00172007     t2 = 0.28398
--------------------------------------------------------------------------------
  -------------------------
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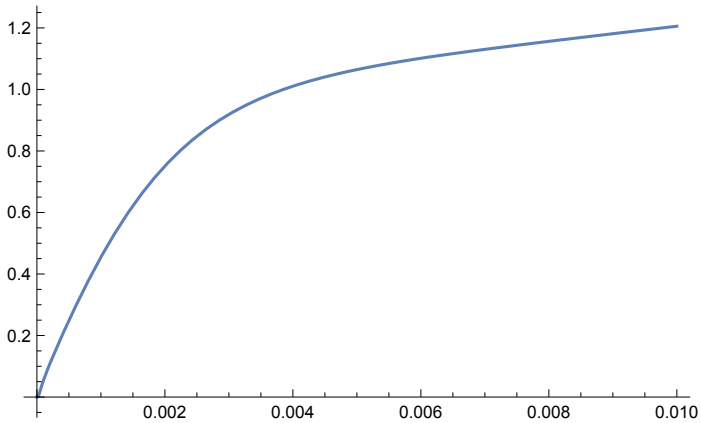
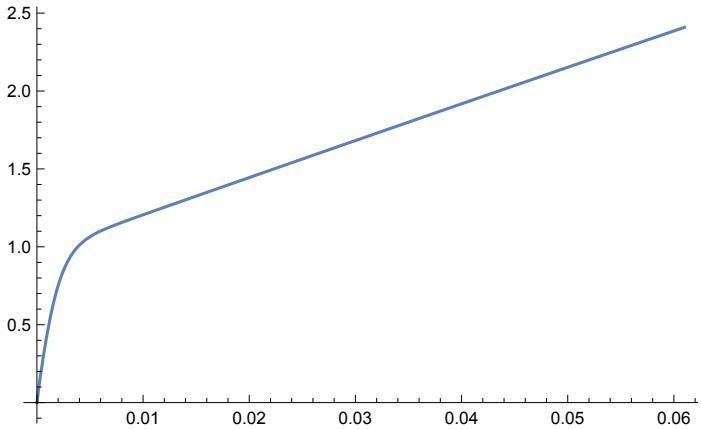
---------- Ca = 7.4968
uM ----------





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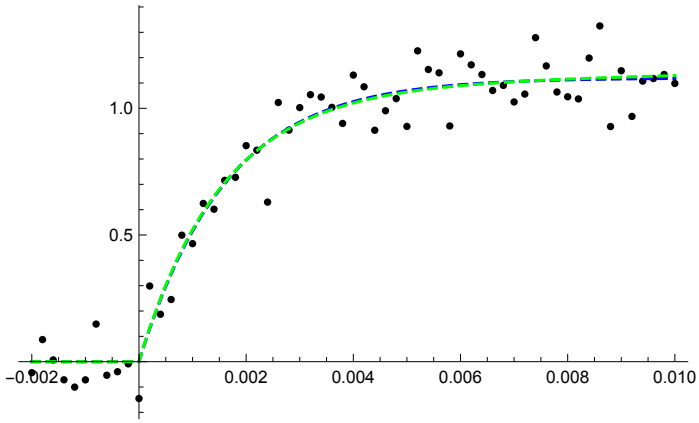

Mono: chi2 = 0.525575 d = 0.525575 a = 1.12017 t = 0.00161255

Bi: ratio chi2Mono/chi2Bi = 0.990683 d = -1.56094×10^{-17}

a = 1.29781 a1 = 1.0768 t1 =0.00153282 t2 = 0.0357976

---------- C10

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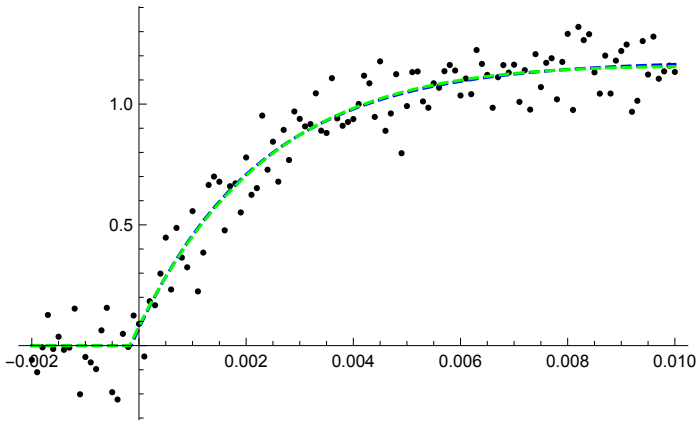


```
Mono: chi2 = 1.20722     d = 1.20722     a = 1.17962     t = 0.00233782
Bi: ratio chi2Mono/chi2Bi = 1.00177     d = -0.000172282     a =
 1.13643     a1 = 3.51256     t1 =0.0031552     t2 = 0.00375634
------------------------------------------------------------------------ D
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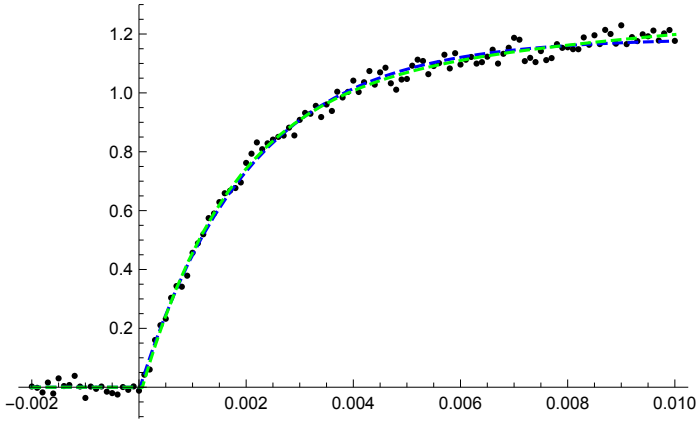


```
Mono: chi2 = 0.0678834     d = 0.0678834     a = 1.1851     t = 0.00205174
Bi: ratio chi2Mono/chi2Bi = 1.16697     d = 0.0000638824     a =
 4.34147     a1 = 1.05433     t1 =0.00171288     t2 = 0.216928
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----------------     Ca = 7.83735
  uM          -------------------------------------------------------
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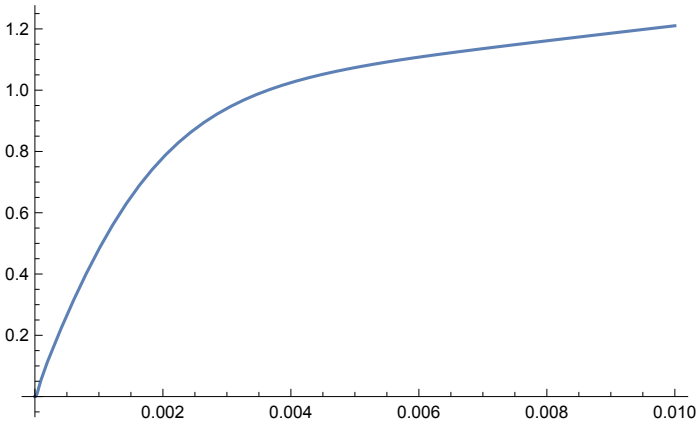

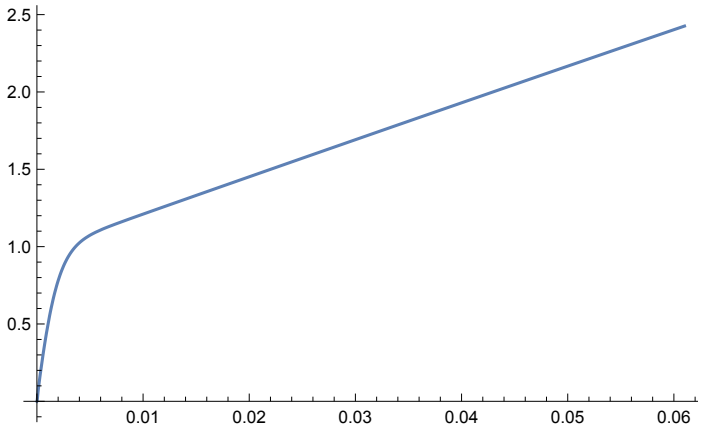

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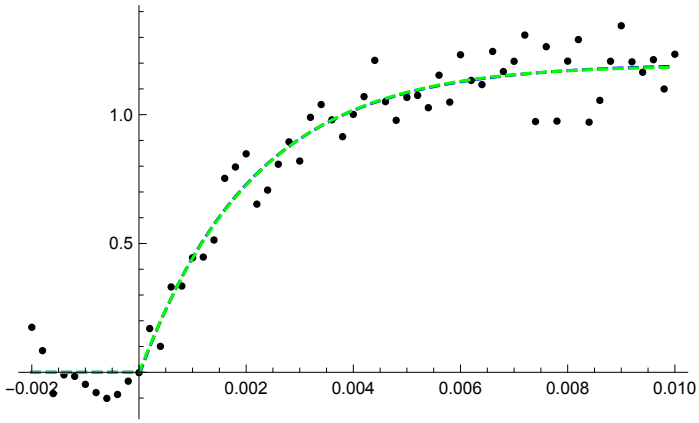

Mono: chi2 = 0.482914 d = 0.482914 a = 1.19832 t = 0.00211141

Bi: ratio chi2Mono/chi2Bi = 1.00041 d = 6.95704×10^{-6} a = 1.18609 a1 = 2.23808 t1 =0.00247203 t2 = 0.0029909

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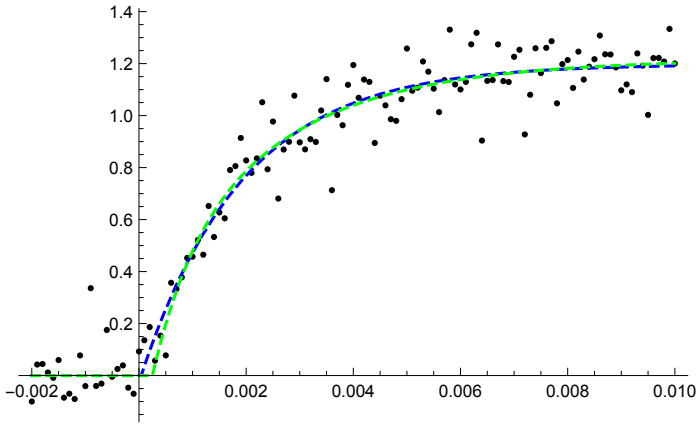


```
Mono: chi2 = 1.15478     d = 1.15478     a = 1.19755     t = 0.00190294
Bi: ratio chi2Mono/chi2Bi = 0.99751     d = 0.000251596     a =
 1.21692     a1 = 0.431163     t1 =0.000741205     t2 = 0.00249098
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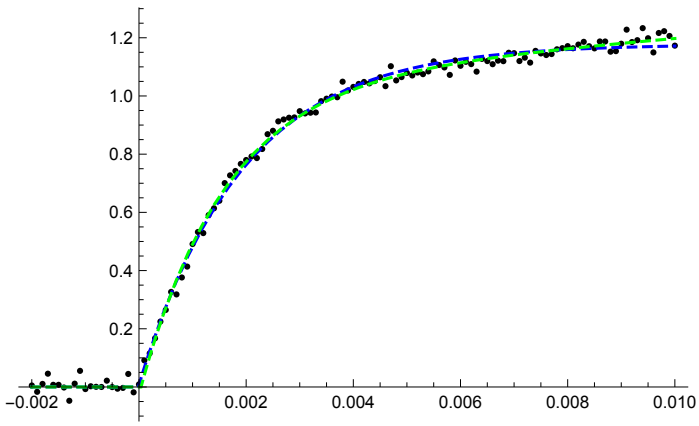

```
Mono: chi2 = 0.0630159     d = 0.0630159     a = 1.17785     t = 0.00192367
Bi: ratio chi2Mono/chi2Bi = 1.28379     d = 0.0000384896     a =
 4.96763     a1 = 1.04435     t1 =0.00157731     t2 = 0.247114
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----------------     Ca = 8.19526
  uM         -------------------------------------------------------
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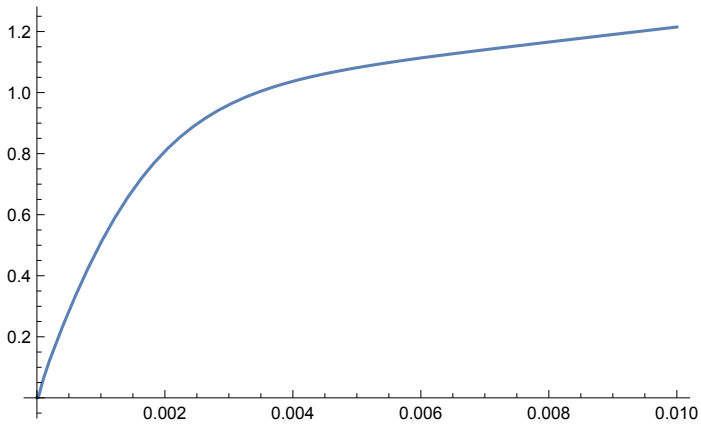

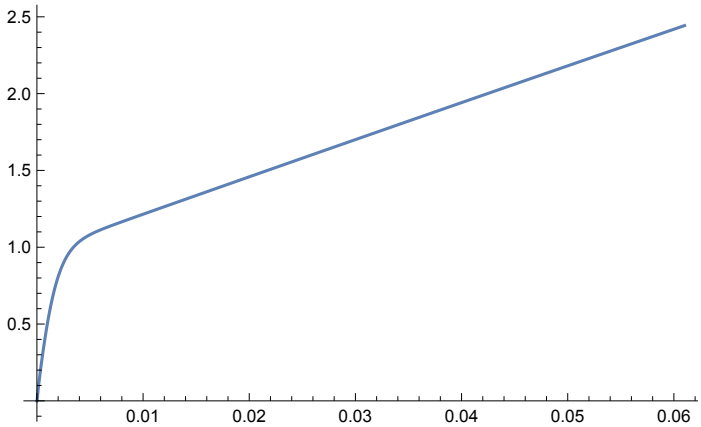


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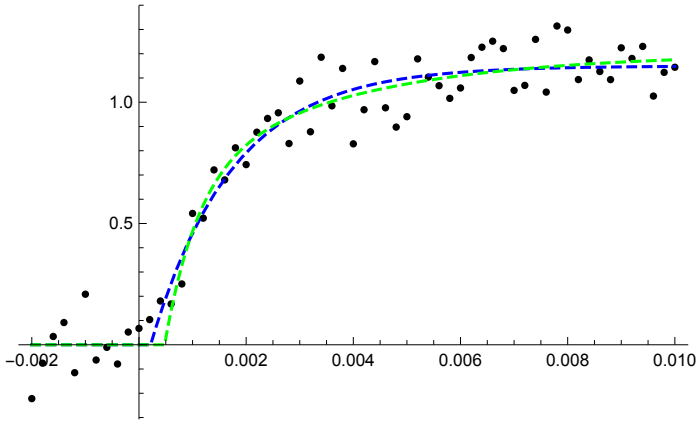


```
Mono: chi2 = 0.613941     d = 0.613941     a = 1.14933     t = 0.0015259

Bi: ratio chi2Mono/chi2Bi = 1.01118     d = 0.000479243     a =
 1.20178     a1 = 0.690784     t1 =0.000622769     t2 = 0.00322529

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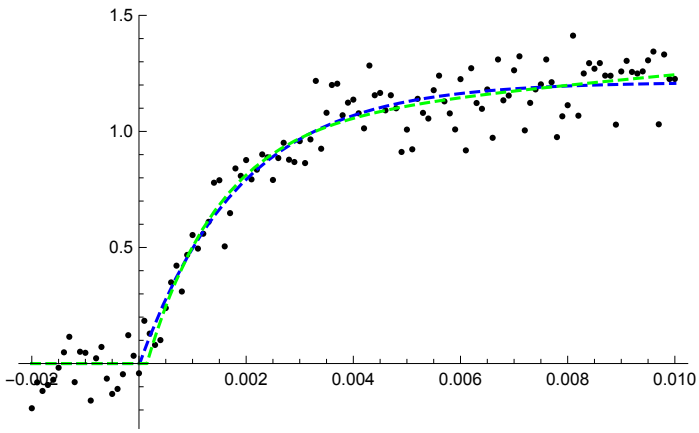


```
Mono: chi2 = 1.21839     d = 1.21839     a = 1.21267     t = 0.00187042
Bi: ratio chi2Mono/chi2Bi = 1.02103     d = 0.000148265
      a = 6.93013     a1 = 1.02831     t1 =0.00133584     t2 = 0.26346
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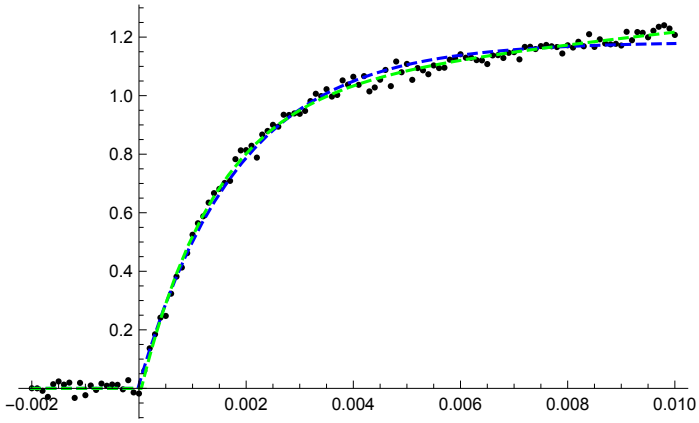


```
Mono: chi2 = 0.0713926     d = 0.0713926     a = 1.18319     t = 0.00184174
Bi: ratio chi2Mono/chi2Bi = 1.79588     d = 0.0000443588
      a = 6.52004     a1 = 1.0082     t1 =0.00139442     t2 = 0.256809
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----------------     Ca = 8.57176
  uM          -------------------------------------------------------
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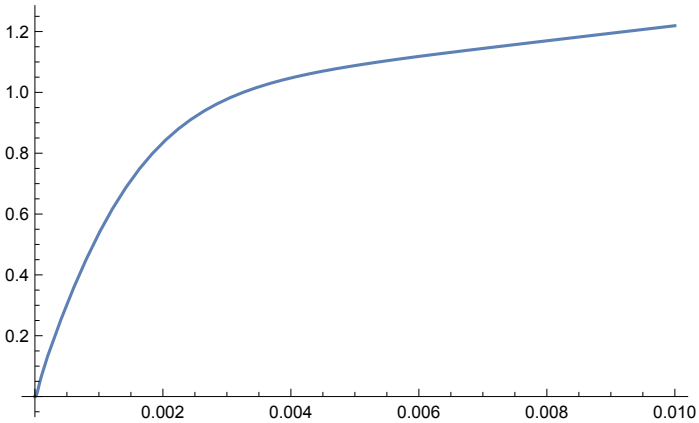

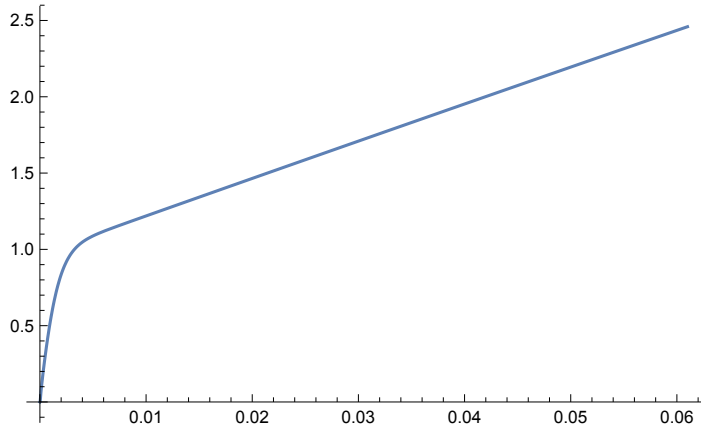

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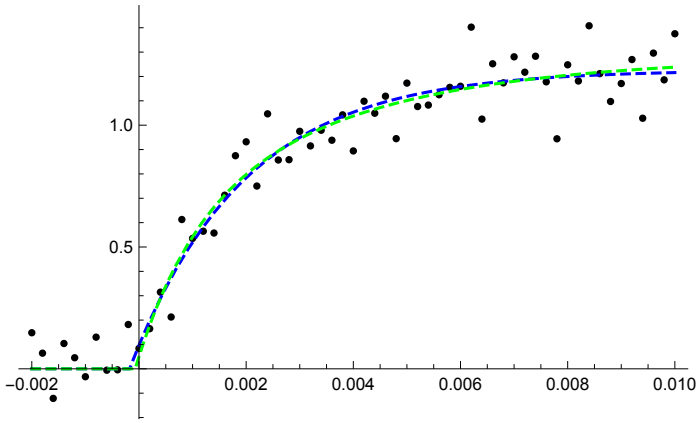


```
Mono: chi2 = 0.621178     d = 0.621178     a = 1.22617     t = 0.00212974
Bi: ratio chi2Mono/chi2Bi = 1.02059     d = -0.0000695617     a =
 1.28345     a1 = 0.574424     t1 =0.00106893     t2 = 0.00365755
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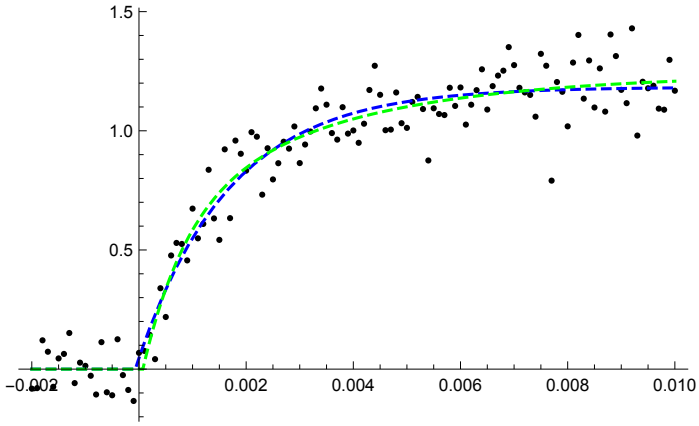


```
Mono: chi2 = 1.37736     d = 1.37736     a = 1.18322     t = 0.0017074
Bi: ratio chi2Mono/chi2Bi = 1.03233     d = 0.0000729541     a =
 1.23856     a1 = 0.643416     t1 =0.000805874     t2 = 0.00334265
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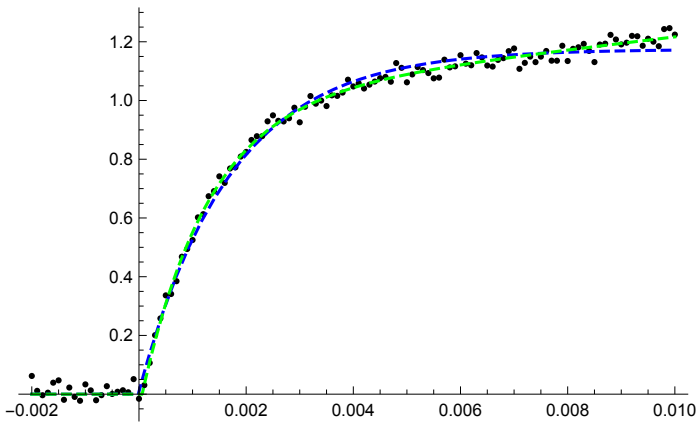
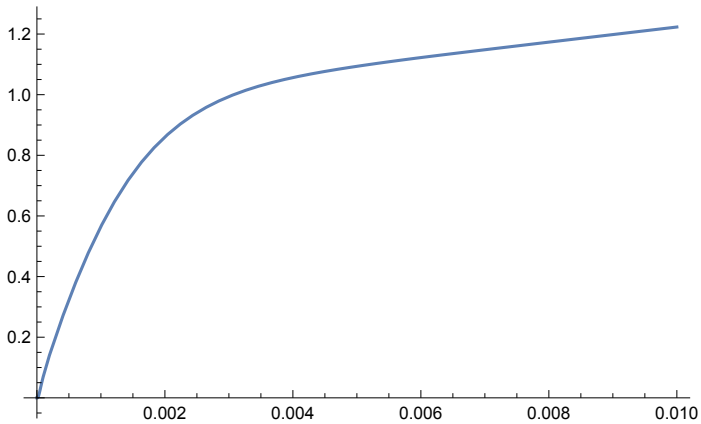
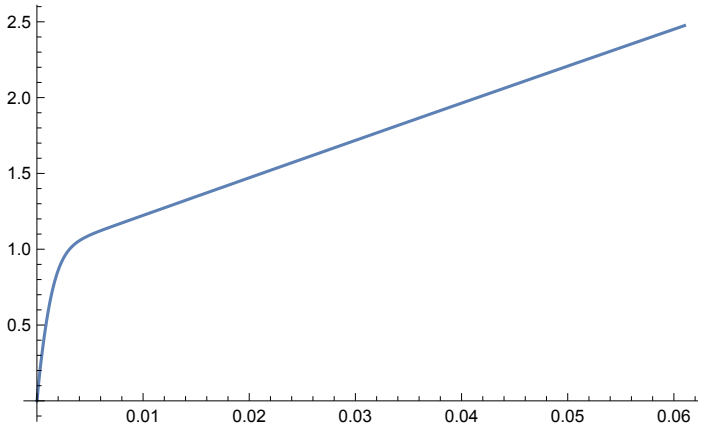


```
Mono: chi2 = 0.0996295     d = 0.0996295     a = 1.17465     t = 0.00169509
Bi: ratio chi2Mono/chi2Bi = 1.78725     d = 0.0000594658     a =
 6.21455     a1 = 0.996355     t1 =0.00124008     t2 = 0.230092
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 8.96782
  uM         -------------------------------------------------------
-------------------------------------------------------------------------------------
  -------------------------
```



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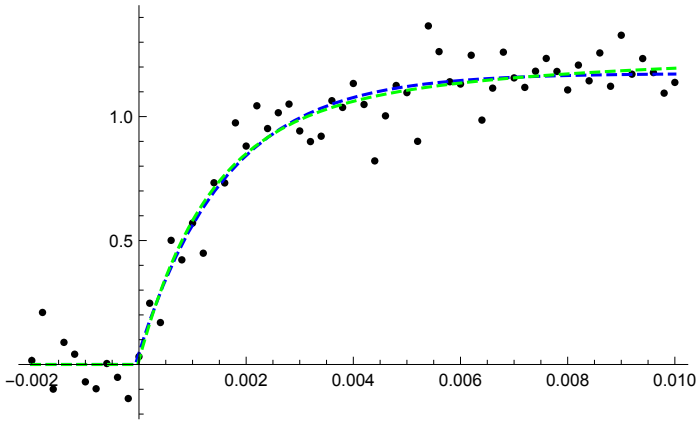


```
Mono: chi2 = 0.595751     d = 0.595751     a = 1.17401     t = 0.00162996

Bi: ratio chi2Mono/chi2Bi = 1.01608     d = -0.000020828     a =
 1.24562     a1 = 0.941693     t1 =0.00123517     t2 = 0.00556726

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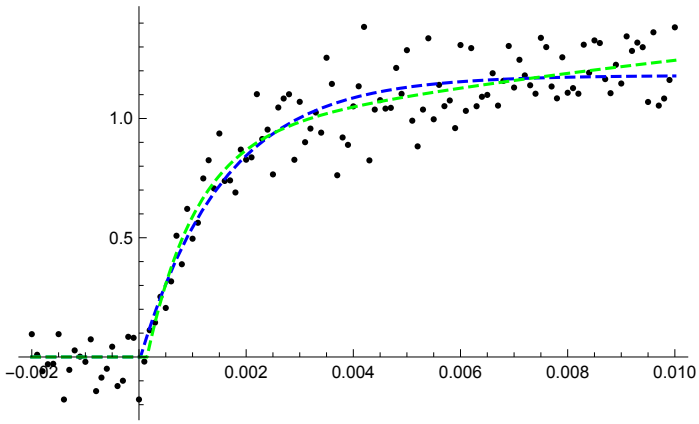


```
Mono: chi2 = 1.57427     d = 1.57427     a = 1.18044     t = 0.00156739
Bi: ratio chi2Mono/chi2Bi = 1.08206     d = 0.000150522     a =
 1.74114     a1 = 0.910045     t1 =0.00090893     t2 = 0.0191672
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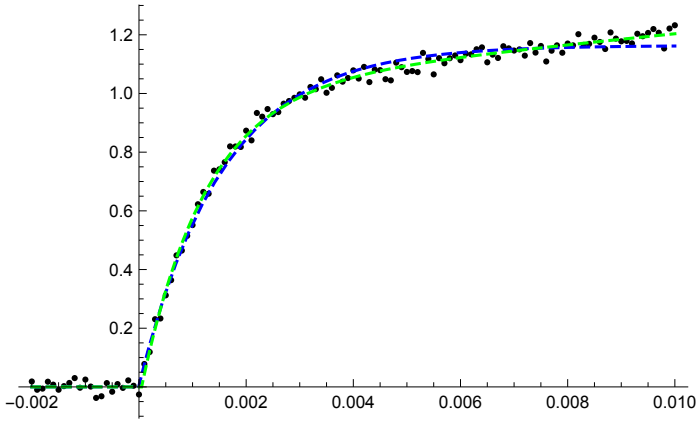
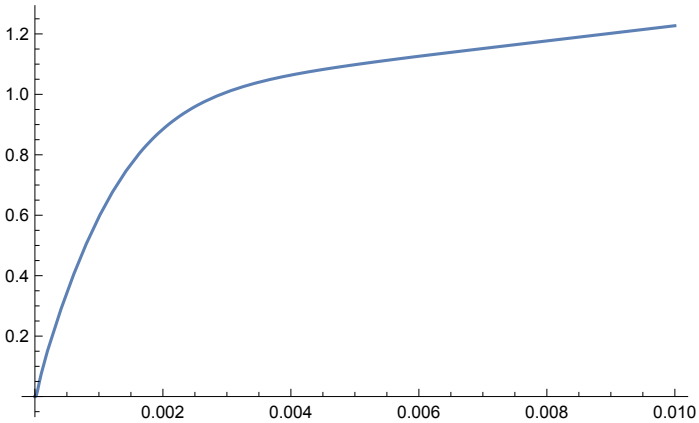
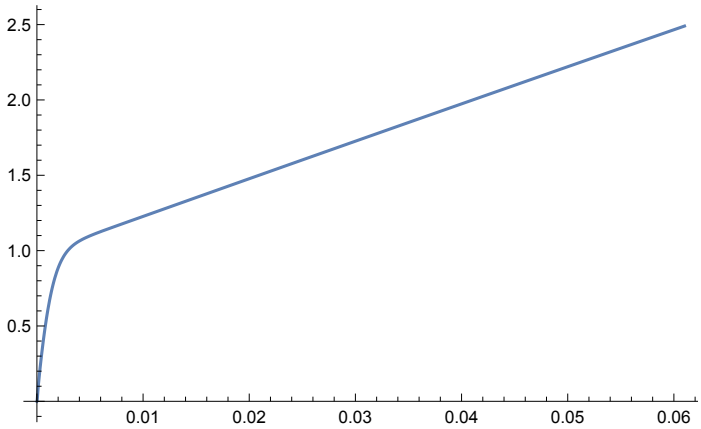



```
Mono: chi2 = 0.085197     d = 0.085197     a = 1.1636     t = 0.00155102
Bi: ratio chi2Mono/chi2Bi = 1.78721     d = 0.0000495756     a =
 5.49874     a1 = 1.01638     t1 =0.00119288     t2 = 0.232989
------------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 9.38444
  uM         -------------------------------------------------------
------------------------------------------------------------------------------------------
  -------------------------
```





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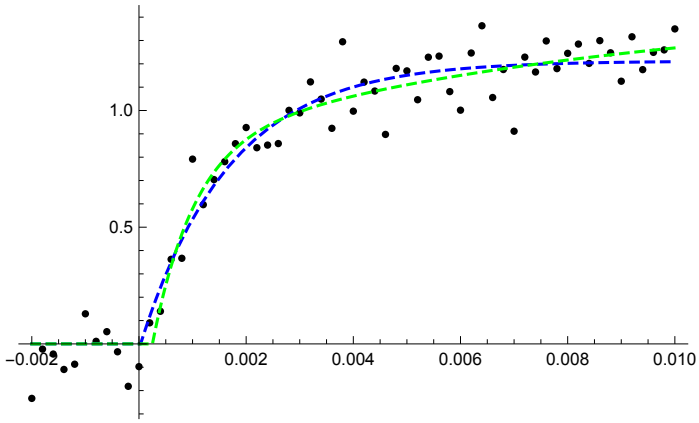


```
Mono: chi2 = 0.665758     d = 0.665758     a = 1.21203     t = 0.00166301
Bi: ratio chi2Mono/chi2Bi = 1.081     d = 0.000251571     a =
 1.4645     a1 = 0.849662     t1 =0.000771682     t2 = 0.00853897
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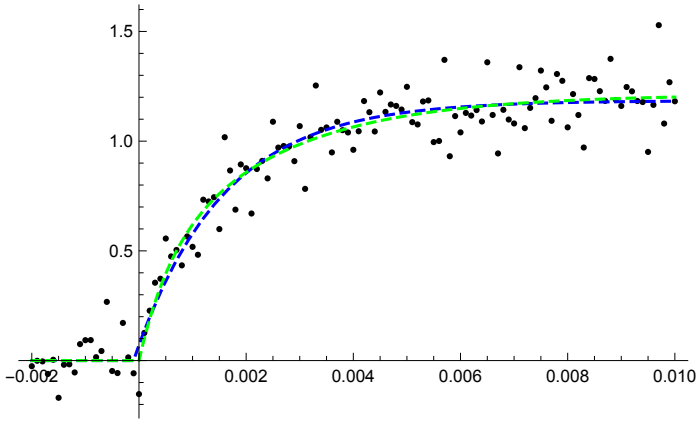

Mono: chi2 = 1.38901 d = 1.38901 a = 1.18446 t = 0.00163965

Bi: ratio chi2Mono/chi2Bi = 1.02982 d = 2.87118×10^{-17} a = 1.21264 a1 = 0.417487 t1 =0.00056519 t2 = 0.00237403

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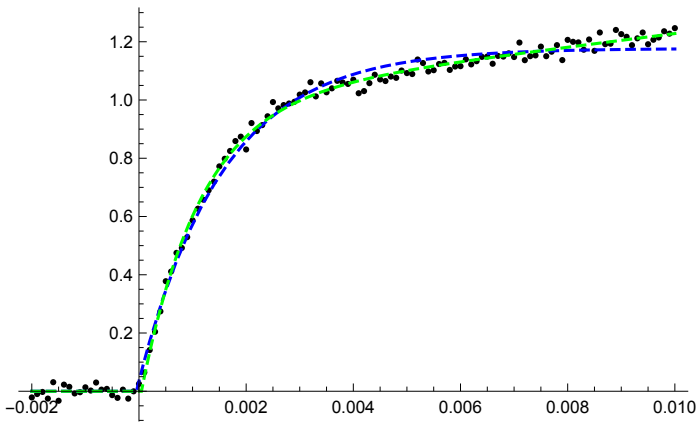

```
Mono: chi2 = 0.108619     d = 0.108619     a = 1.17707     t = 0.00156585
Bi: ratio chi2Mono/chi2Bi = 2.45701     d = 0.000046026     a =
 6.07647     a1 = 0.992375     t1 =0.0010898     t2 = 0.209534
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----------------     Ca = 9.82288
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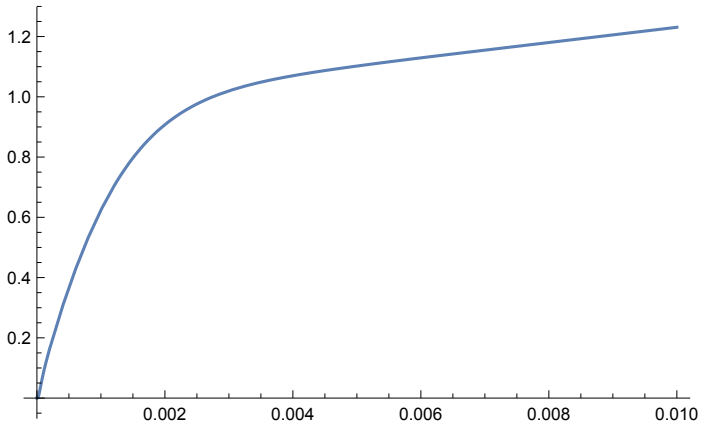

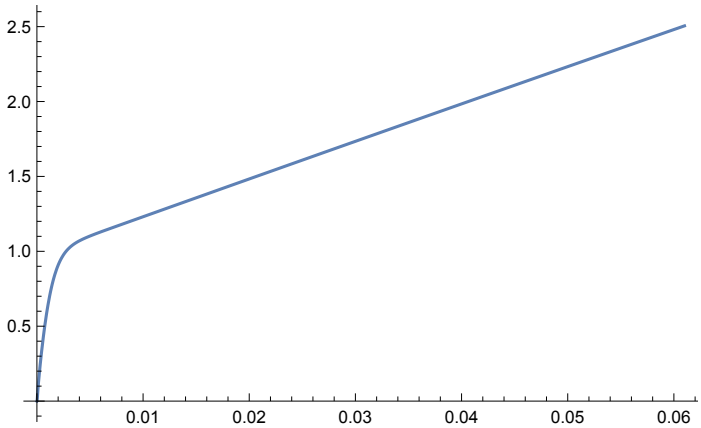


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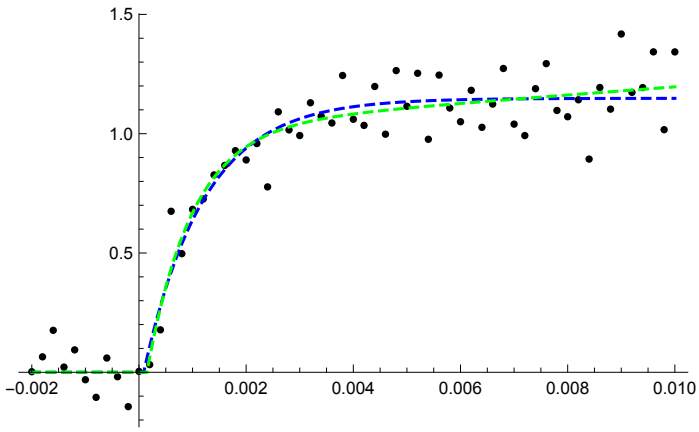


```
Mono: chi2 = 0.703251     d = 0.703251     a = 1.14823     t = 0.00112229
Bi: ratio chi2Mono/chi2Bi = 1.0415     d = 0.000148767     a =
 5.64202     a1 = 1.02516     t1 =0.000838879     t2 = 0.260893
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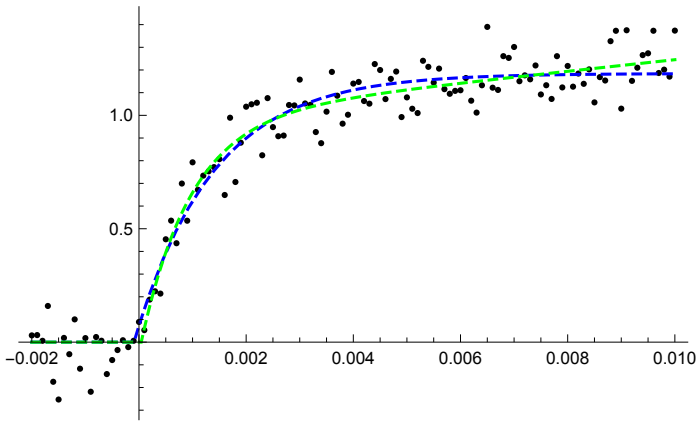


```
Mono: chi2 = 1.12191     d = 1.12191     a = 1.1844     t = 0.00146728
Bi: ratio chi2Mono/chi2Bi = 1.08422     d = 0.0000427293     a =
 7.24126     a1 = 0.986845     t1 =0.000930781     t2 = 0.235898
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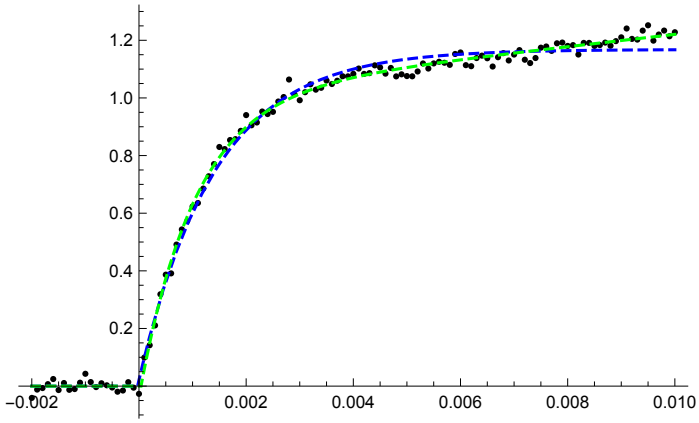


```
Mono: chi2 = 0.110176     d = 0.110176     a = 1.1681     t = 0.0014157
Bi: ratio chi2Mono/chi2Bi = 2.50952     d = 0.0000386454     a =
 6.75153     a1 = 1.00545     t1 =0.00103073     t2 = 0.261063
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  --------------------------
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  uM         -------------------------------------------------------
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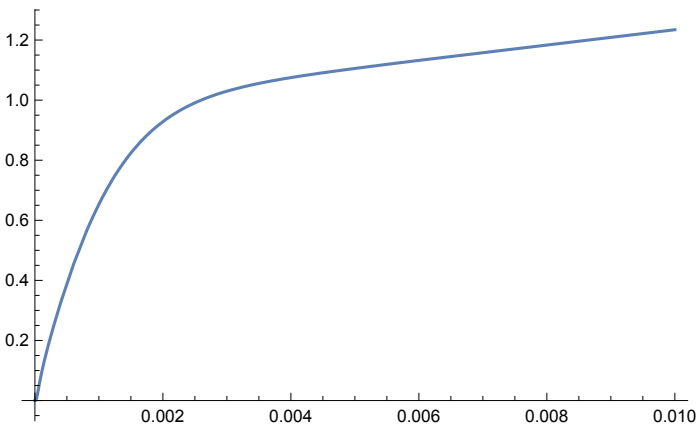

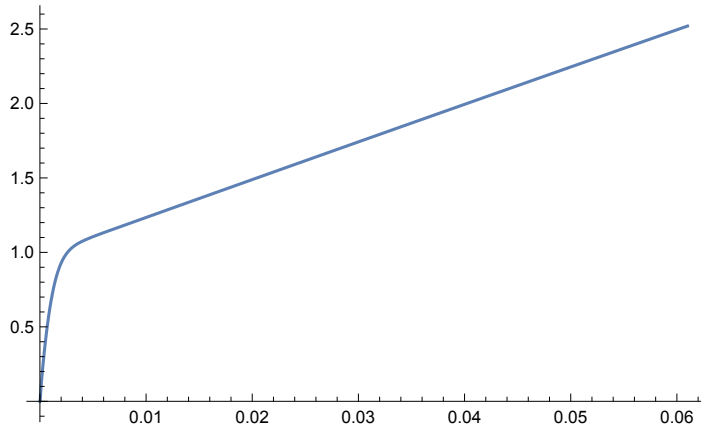

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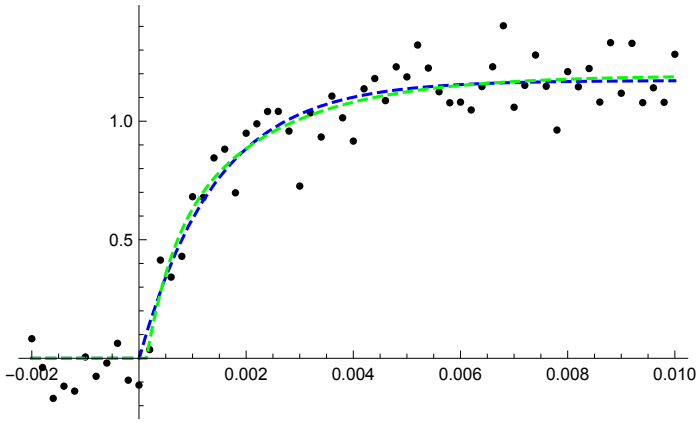


```
Mono: chi2 = 0.667784     d = 0.667784     a = 1.1715     t = 0.00141911
Bi: ratio chi2Mono/chi2Bi = 1.03226     d = 0.000140077     a =
 1.19317     a1 = 0.45209     t1 =0.000482501     t2 = 0.00204805
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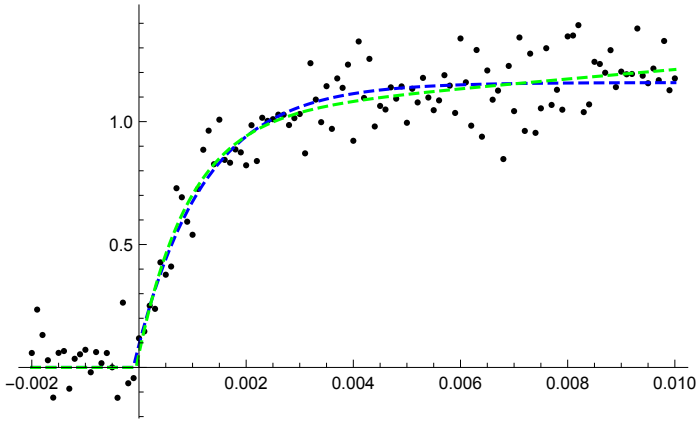


```
Mono: chi2 = 1.42806     d = 1.42806     a = 1.15892     t = 0.0012646
Bi: ratio chi2Mono/chi2Bi = 1.04962     d = -0.0000521715
      a = 7.20514     a1 = 1.01657     t1 =0.000945846     t2 = 0.31319
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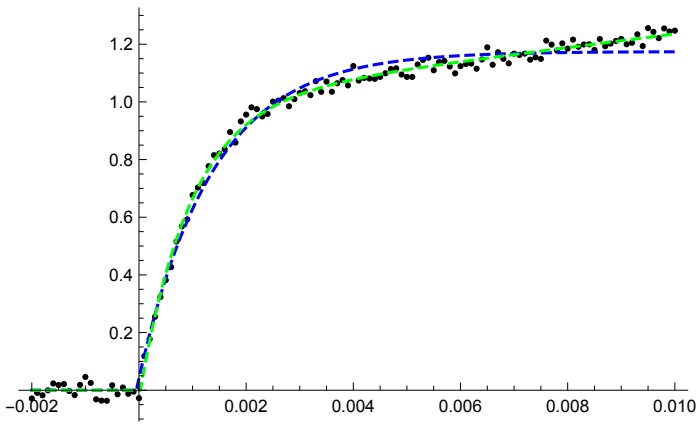

```
Mono: chi2 = 0.142279     d = 0.142279     a = 1.17454     t = 0.00136937
Bi: ratio chi2Mono/chi2Bi = 2.92027     d = 0.0000259672     a =
 7.54015     a1 = 0.995983     t1 =0.000946466     t2 = 0.267098
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  -------------------------
----------------     Ca = 10.77
  uM         -------------------------------------------------------
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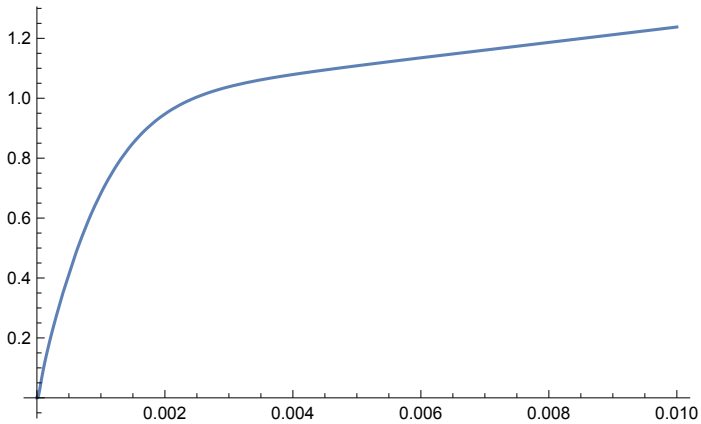

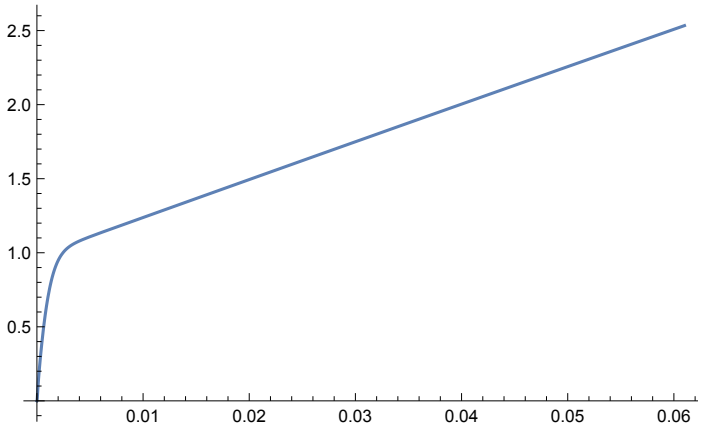


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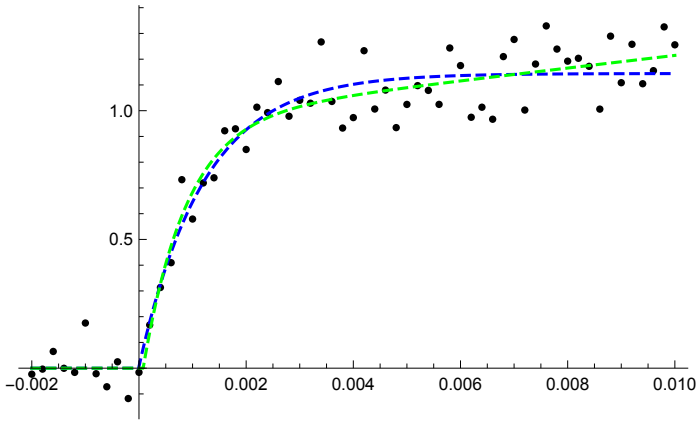


```
Mono: chi2 = 0.582109     d = 0.582109     a = 1.14439     t = 0.00121197
Bi: ratio chi2Mono/chi2Bi = 1.12867     d = 0.0000784193     a =
 9.33271     a1 = 0.967983     t1 =0.000804046     t2 = 0.33143
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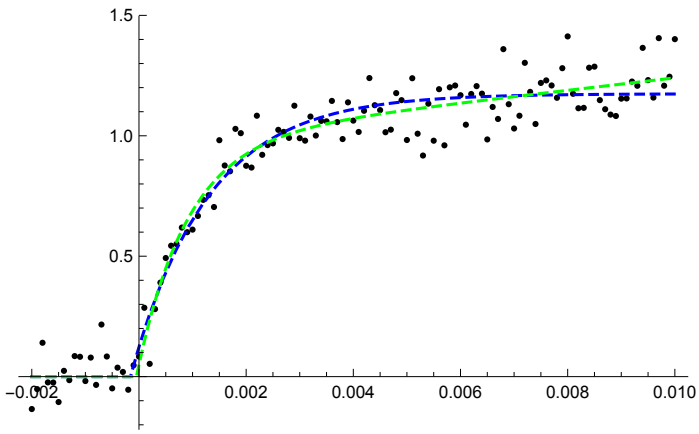


```
Mono: chi2 = 1.02548     d = 1.02548     a = 1.17445     t = 0.0014307
Bi: ratio chi2Mono/chi2Bi = 1.12512     d = -0.0000469169     a =
 9.99659     a1 = 0.977846     t1 =0.000929704     t2 = 0.339905
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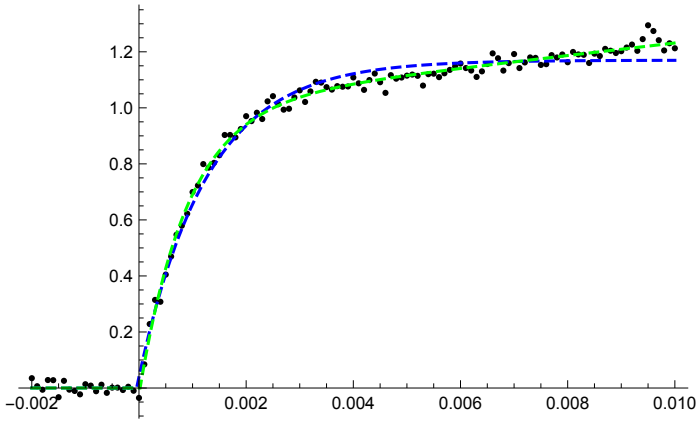


```
Mono: chi2 = 0.150927     d = 0.150927     a = 1.16995     t = 0.00126908
Bi: ratio chi2Mono/chi2Bi = 2.68562     d = 0.000020678     a =
 8.07136     a1 = 1.00549     t1 =0.000896566     t2 = 0.307007
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----------------     Ca = 11.2815
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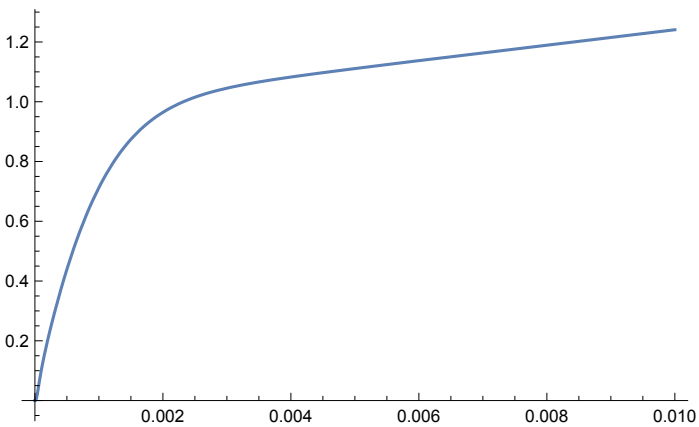

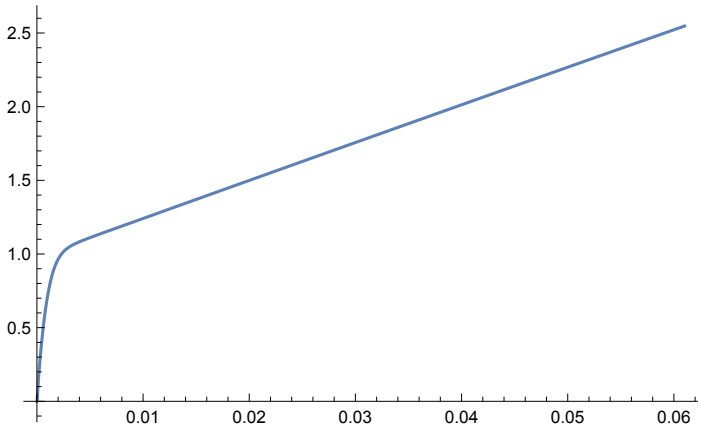

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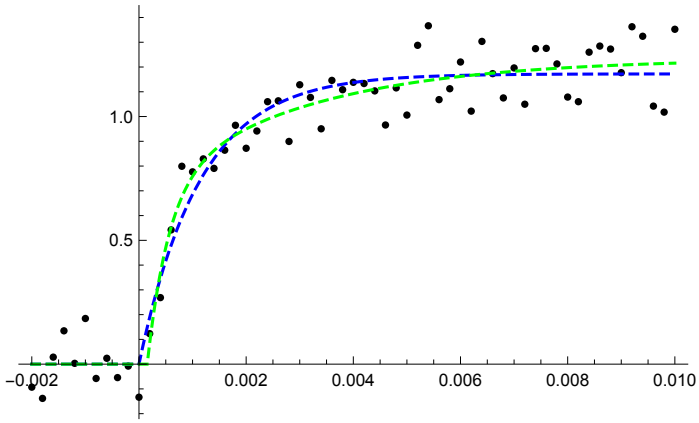


```
Mono: chi2 = 0.657883     d = 0.657883     a = 1.17217     t = 0.0011378
Bi: ratio chi2Mono/chi2Bi = 1.13768     d = 0.000154448     a =
 1.23466     a1 = 0.719487     t1 =0.000402649     t2 = 0.00298629
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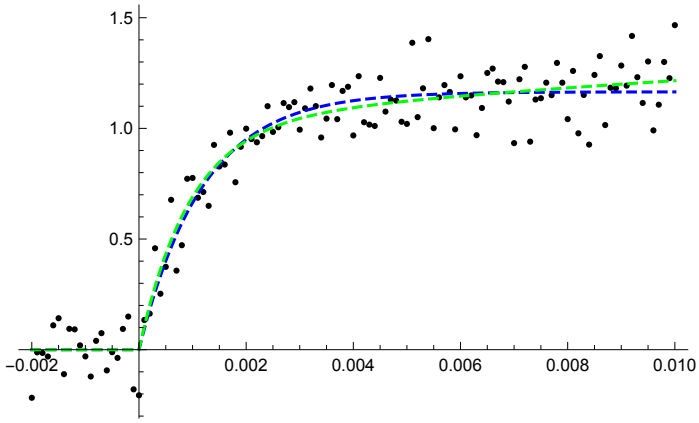

Mono: chi2 = 1.50172 d = 1.50172 a = 1.16498 t = 0.00118501

Bi: ratio chi2Mono/chi2Bi = 1.02149 d = 6.32129×10^{-18}

a = 1.52516 a1 = 1.01565 t1 =0.000939788 t2 = 0.02008

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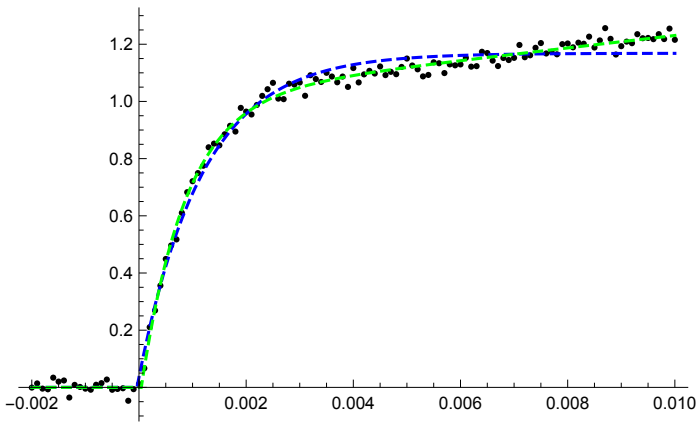

```
Mono: chi2 = 0.147387     d = 0.147387     a = 1.16837     t = 0.0011937
Bi: ratio chi2Mono/chi2Bi = 2.91662     d = 0.0000433501     a =
 6.78041     a1 = 1.01053     t1 =0.000827716     t2 = 0.256034
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 11.8202
  uM         -------------------------------------------------------
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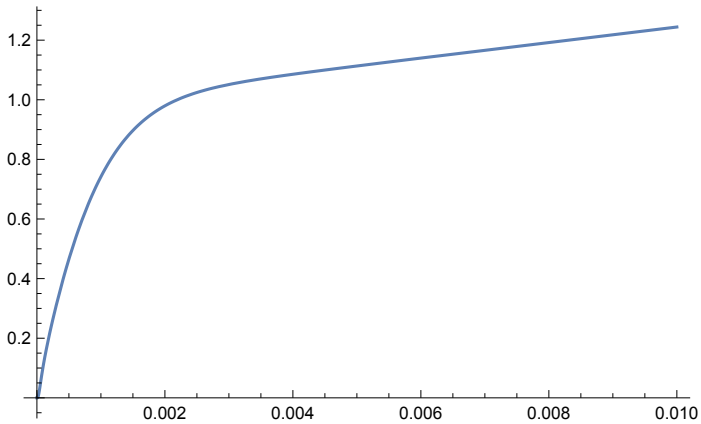

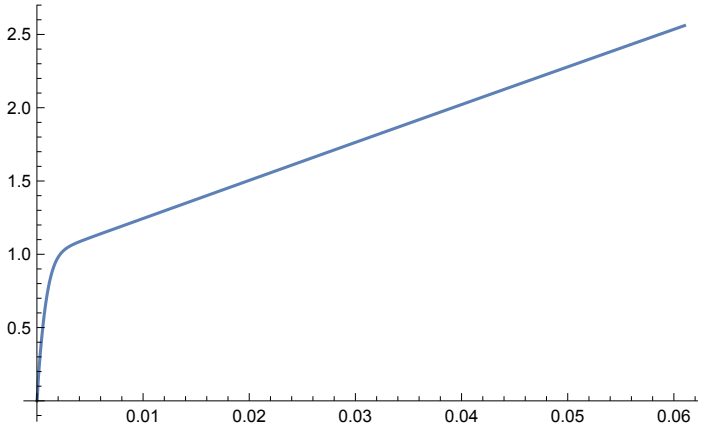


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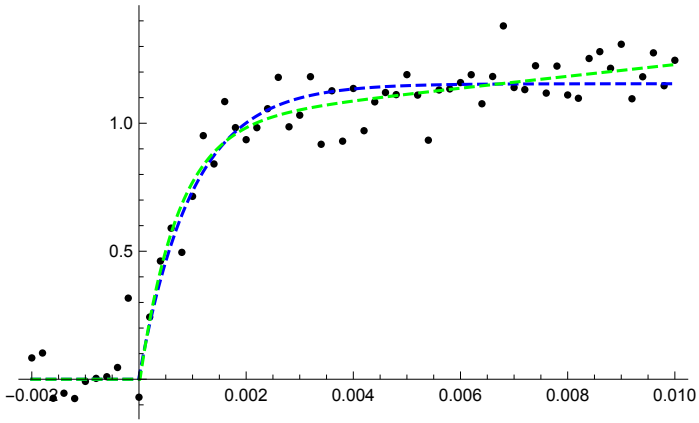


```
Mono: chi2 = 0.576219     d = 0.576219     a = 1.15435     t = 0.000993452
Bi: ratio chi2Mono/chi2Bi = 1.1529     d = 0.0000190105     a =
 6.32618     a1 = 0.996297     t1 =0.000709679     t2 = 0.223355
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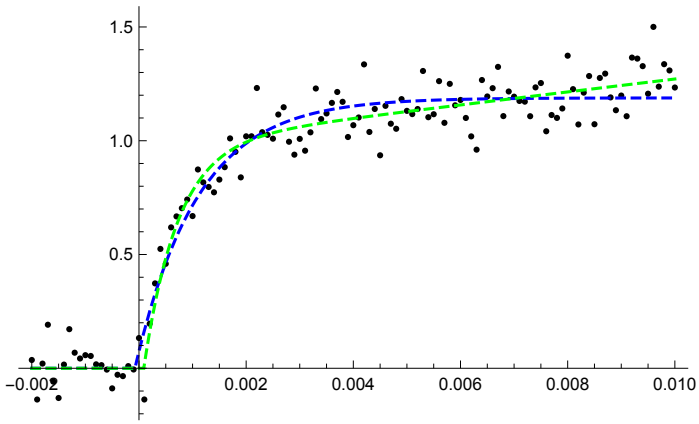


```
Mono: chi2 = 1.16825     d = 1.16825     a = 1.18819     t = 0.00116421
Bi: ratio chi2Mono/chi2Bi = 1.18241     d = 0.0000900871     a =
 8.47894     a1 = 0.985597     t1 =0.000630358     t2 = 0.255007
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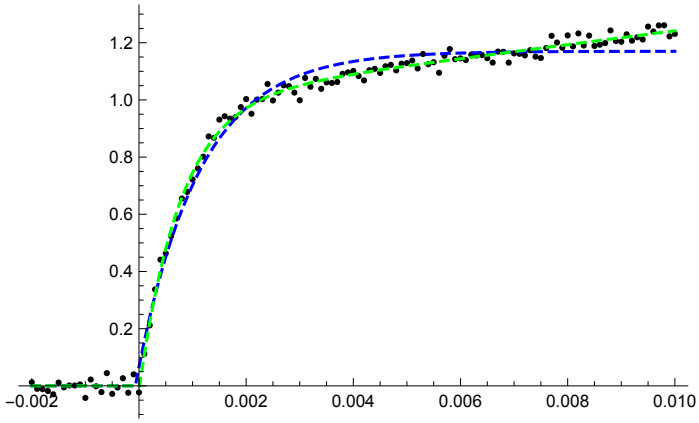


```
Mono: chi2 = 0.185146     d = 0.185146     a = 1.17024     t = 0.00116534
Bi: ratio chi2Mono/chi2Bi = 3.61745     d = 0.0000131476     a =
 5.769     a1 = 0.995122     t1 =0.000767074     t2 = 0.188304
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----------------     Ca = 12.3876
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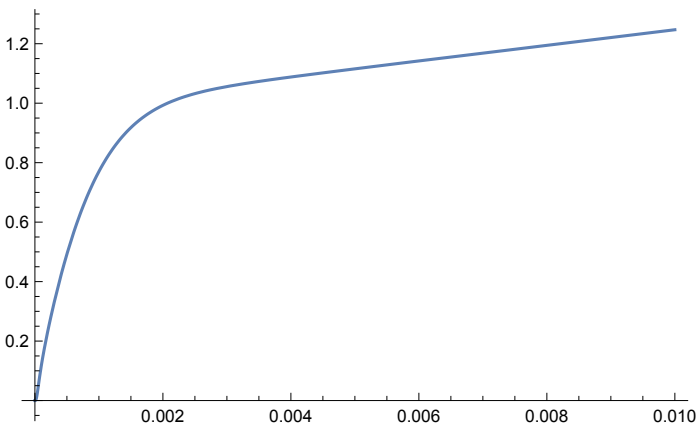

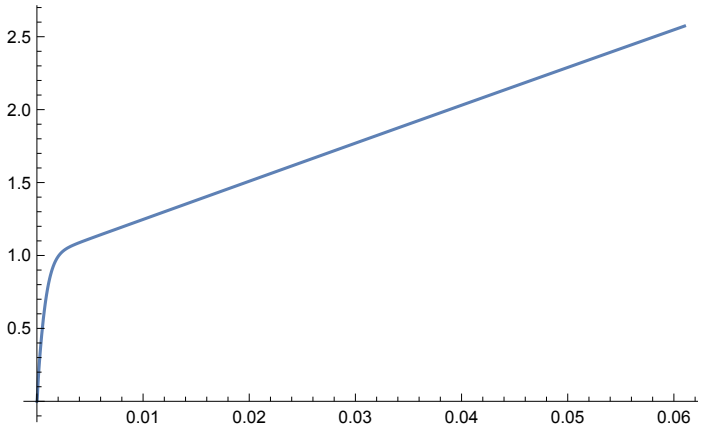

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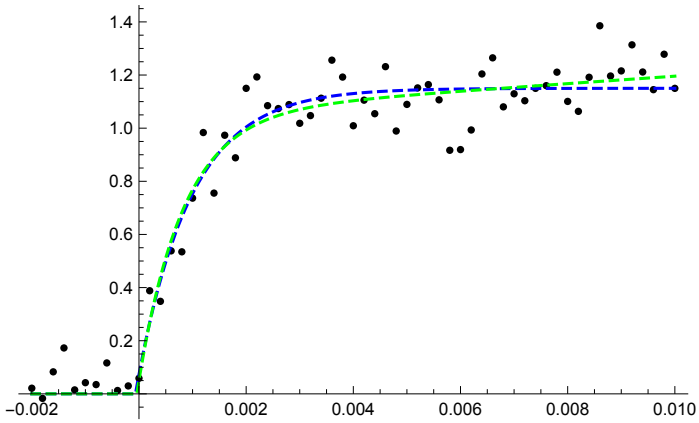


```
Mono: chi2 = 0.561092     d = 0.561092     a = 1.15003     t = 0.00100026
Bi: ratio chi2Mono/chi2Bi = 1.05306     d = -0.0000403854     a =
 7.90851     a1 = 1.05386     t1 =0.000829721     t2 = 0.480216
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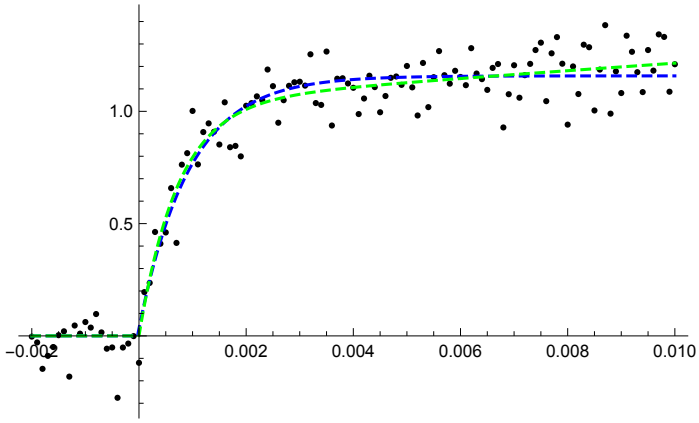

Mono: chi2 = 1.23302 d = 1.23302 a = 1.15789 t = 0.00094303

Bi: ratio chi2Mono/chi2Bi = 1.07056 d = 6.33036×10^{-19} a = 2.22197 a1 = 1.03538 t1 =0.000723326 t2 = 0.0611091

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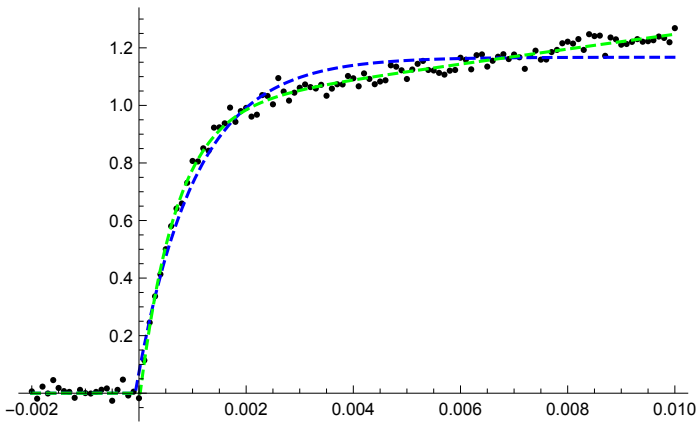

```
Mono: chi2 = 0.223226     d = 0.223226     a = 1.16736     t = 0.00109261
Bi: ratio chi2Mono/chi2Bi = 4.41663     d = 0.0000228055     a =
 5.86064     a1 = 0.98423     t1 =0.000677838     t2 = 0.179927
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----------------     Ca = 12.9855
  uM         -------------------------------------------------------
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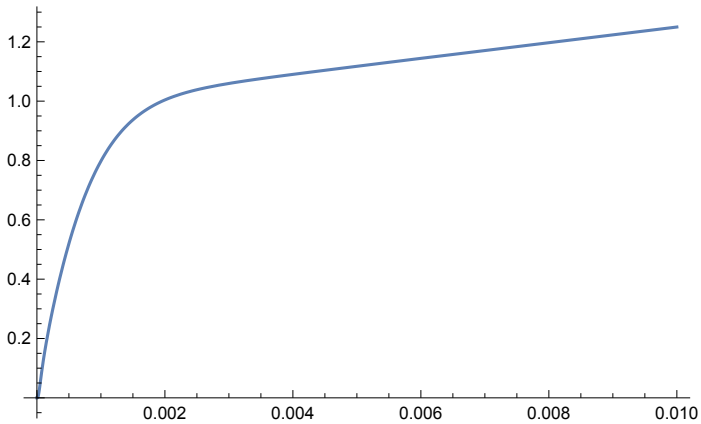

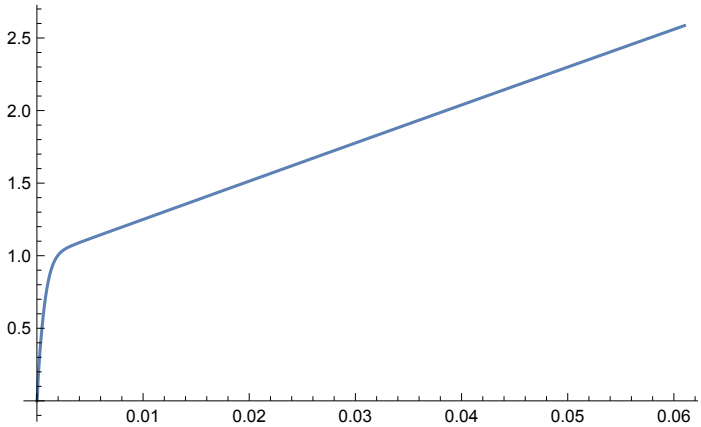


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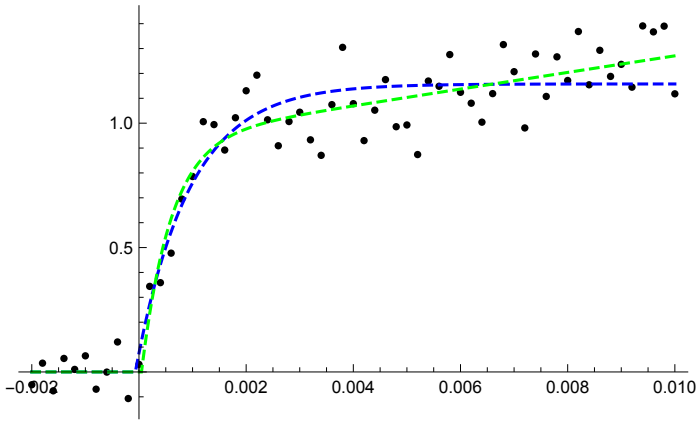


```
Mono: chi2 = 0.86597     d = 0.86597     a = 1.15769     t = 0.000999622
Bi: ratio chi2Mono/chi2Bi = 1.30014     d = 0.0000472653     a =
 18.9613     a1 = 0.936467     t1 =0.000544156     t2 = 0.531776
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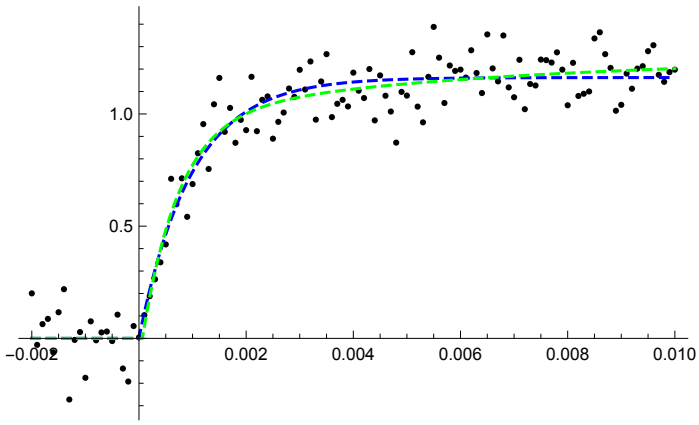


```
Mono: chi2 = 1.37631     d = 1.37631     a = 1.16222     t = 0.000984669
Bi: ratio chi2Mono/chi2Bi = 1.04893     d = 0.0000640011     a =
 1.25367     a1 = 0.984955     t1 =0.000684353     t2 = 0.00601758
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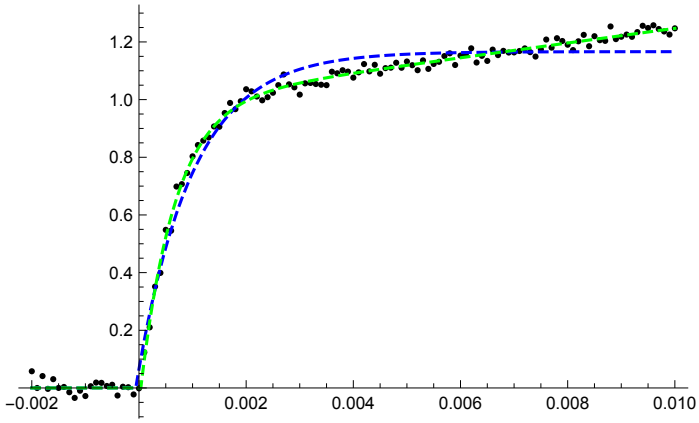


```
Mono: chi2 = 0.219851     d = 0.219851     a = 1.16628     t = 0.00103768
Bi: ratio chi2Mono/chi2Bi = 5.07157     d = 0.000034541     a =
 5.76214     a1 = 0.988705     t1 =0.000641198     t2 = 0.179151
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----------------     Ca = 13.6155
  uM         -------------------------------------------------------
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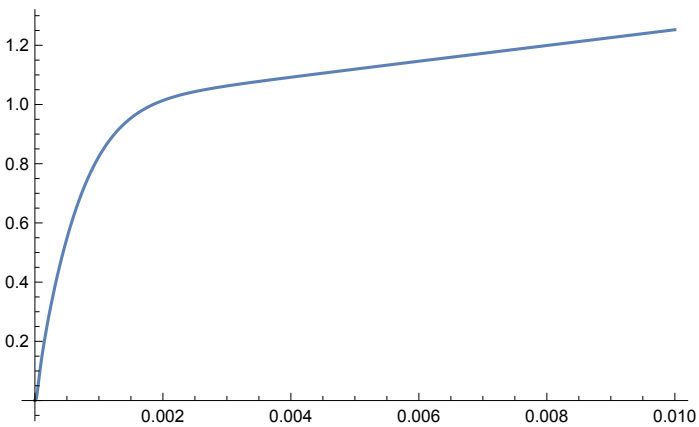

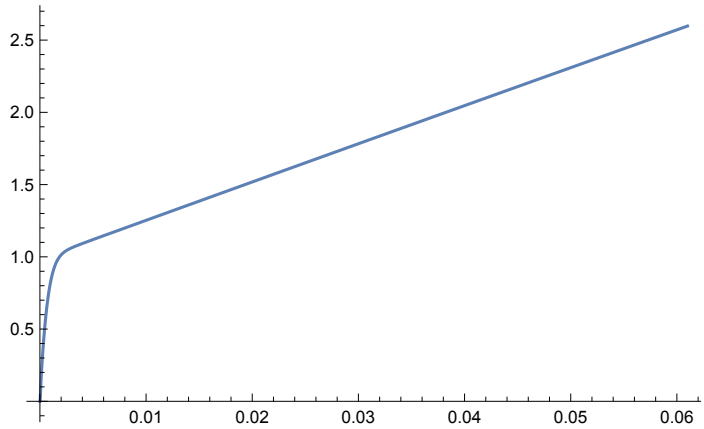

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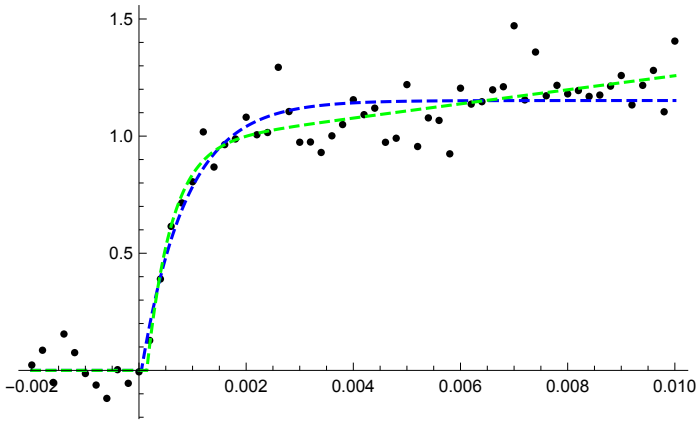


```
Mono: chi2 = 0.686026     d = 0.686026     a = 1.15195     t = 0.00083523
Bi: ratio chi2Mono/chi2Bi = 1.34198     d = 0.000146309     a =
 10.8025     a1 = 0.959352     t1 =0.000458725     t2 = 0.320082
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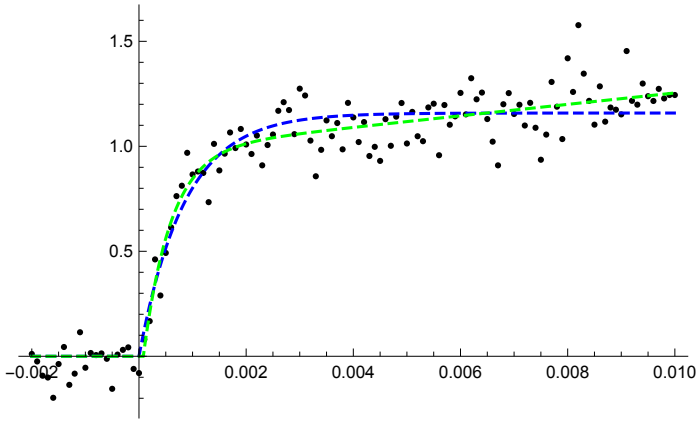

Mono: chi2 = 1.5408 d = 1.5408 a = 1.15847 t = 0.000849764

Bi: ratio chi2Mono/chi2Bi = 1.20675 d = 0.0000812623 a = 11.1173 a1 = 0.981915 t1 =0.000510148 t2 = 0.364385

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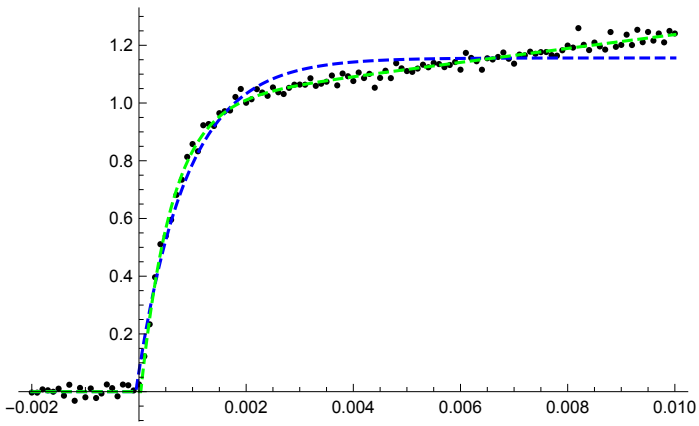

```
Mono: chi2 = 0.221633     d = 0.221633     a = 1.15612     t = 0.000921537
Bi: ratio chi2Mono/chi2Bi = 5.45249     d = 0.000033654     a =
 6.7474     a1 = 0.993727     t1 =0.000573936     t2 = 0.230529
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 14.2795
  uM         -------------------------------------------------------
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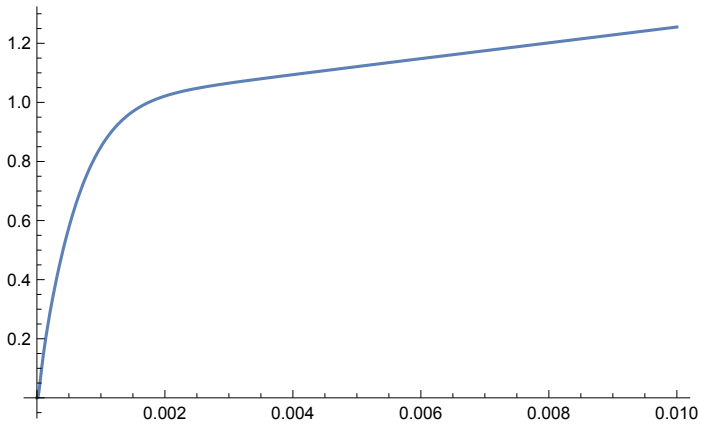

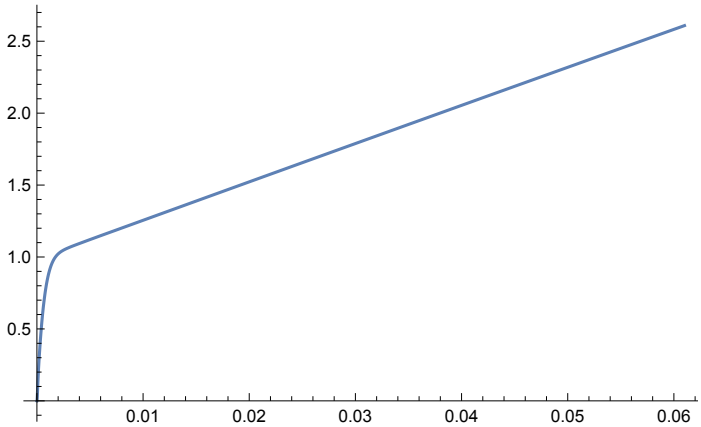


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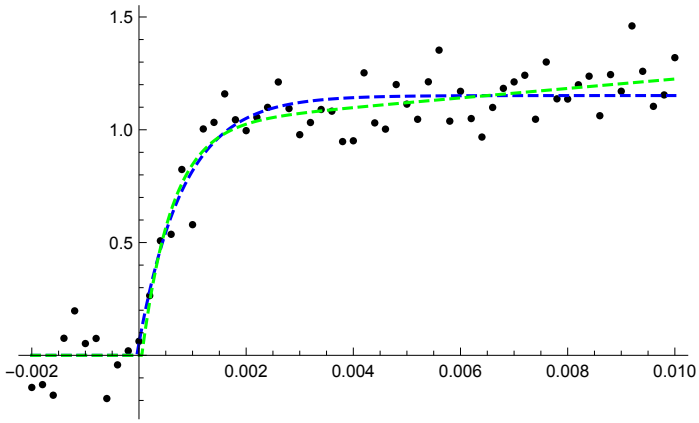


```
Mono: chi2 = 0.783932     d = 0.783932     a = 1.15168     t = 0.000838662

Bi: ratio chi2Mono/chi2Bi = 1.10959     d = 0.0000526434     a =
 9.3991     a1 = 1.01523     t1 =0.000563383     t2 = 0.392531

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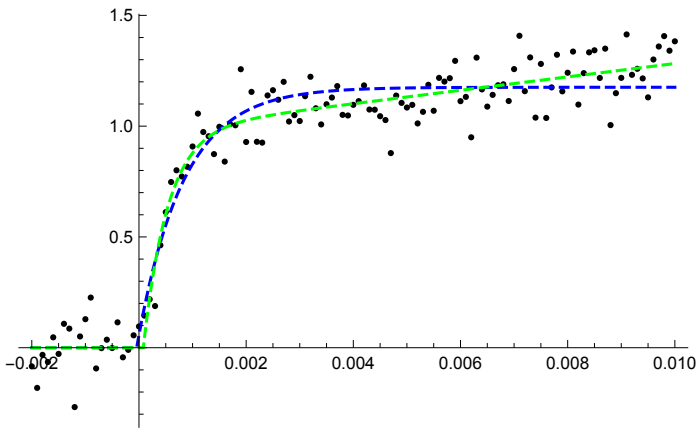


```
Mono: chi2 = 1.50527     d = 1.50527     a = 1.17551     t = 0.000852789
Bi: ratio chi2Mono/chi2Bi = 1.30392     d = 0.0000813245     a =
 23.476     a1 = 0.982154     t1 =0.000456606     t2 = 0.737339
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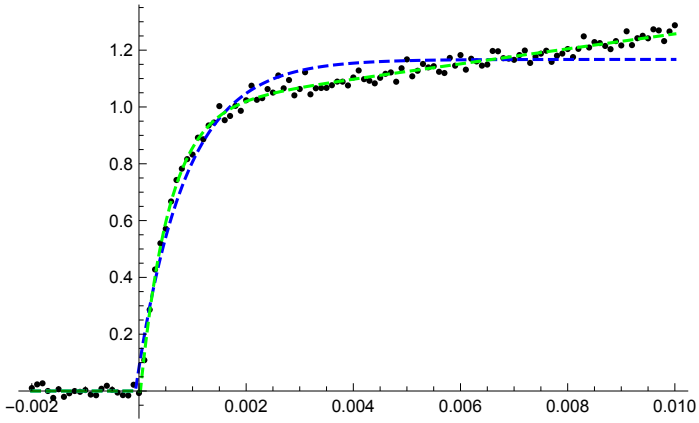


```
Mono: chi2 = 0.27282     d = 0.27282     a = 1.16737     t = 0.000906643
Bi: ratio chi2Mono/chi2Bi = 6.01948     d = 0.0000270697     a =
 6.96657     a1 = 0.990541     t1 =0.000535307     t2 = 0.218475
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 14.9795
  uM          -------------------------------------------------------
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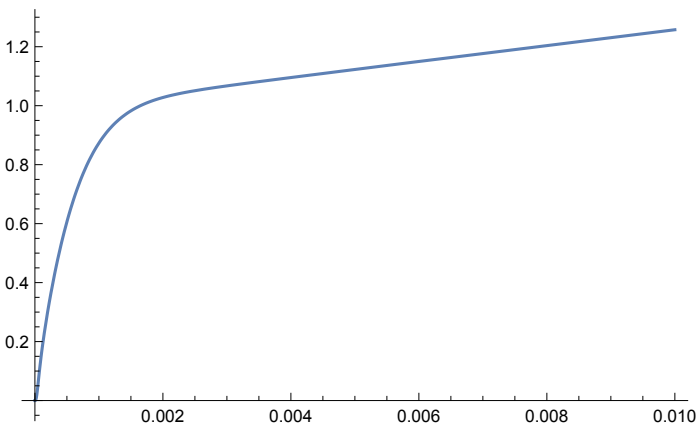

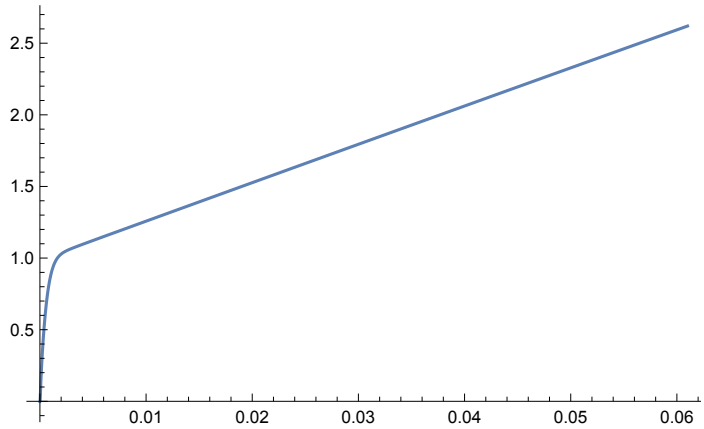

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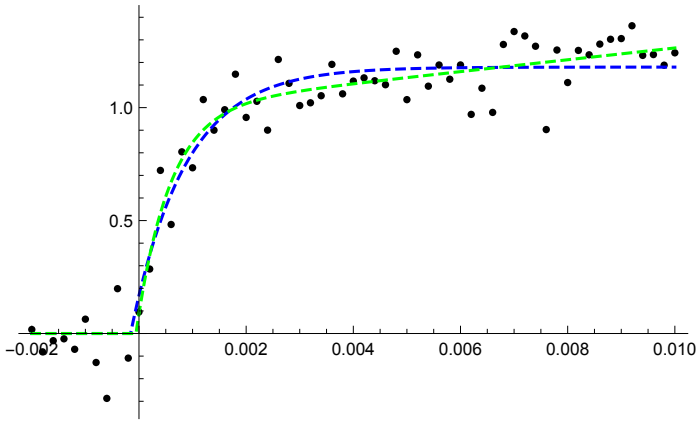


```
Mono: chi2 = 0.788065     d = 0.788065     a = 1.17941     t = 0.00101977
Bi: ratio chi2Mono/chi2Bi = 1.15341     d = -0.0000557797     a =
 9.16202     a1 = 0.998359     t1 =0.000618349     t2 = 0.303911
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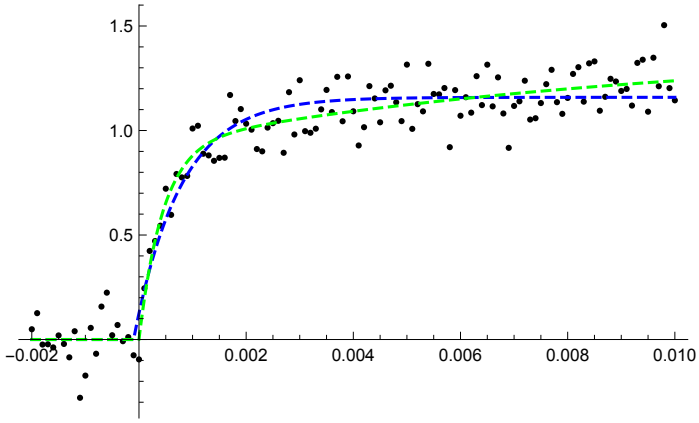

Mono: chi2 = 1.47184 d = 1.47184 a = 1.15878 t = 0.000876417

Bi: ratio chi2Mono/chi2Bi = 1.19701 d = 1.7812×10^{-17} a = 1.40272 a1 = 0.928061 t1 =0.000441525 t2 = 0.00944764

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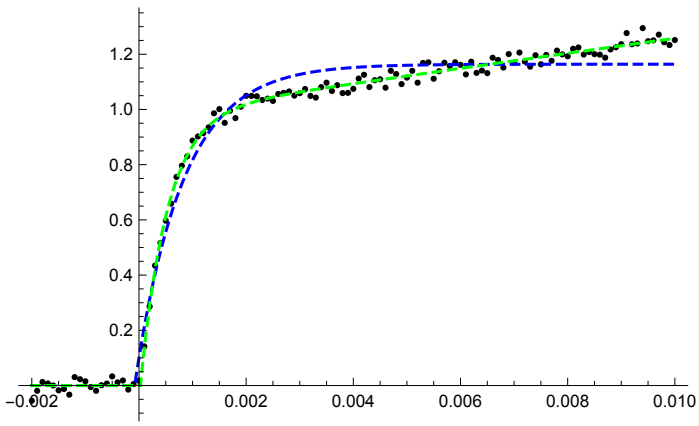

```
Mono: chi2 = 0.30235     d = 0.30235     a = 1.16392     t = 0.00089208
Bi: ratio chi2Mono/chi2Bi = 6.24673     d = 0.0000273213     a =
 6.22215     a1 = 0.981762     t1 =0.000501318     t2 = 0.184361
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----------------     Ca = 15.7174
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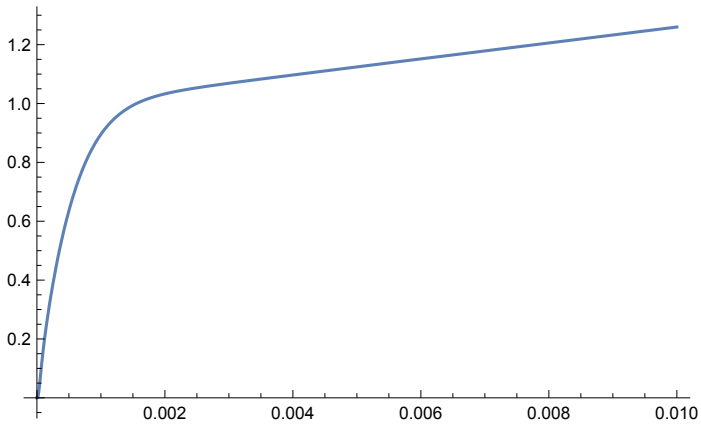

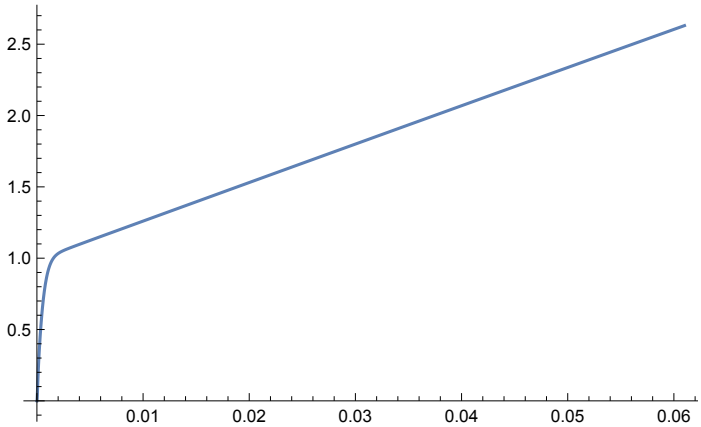


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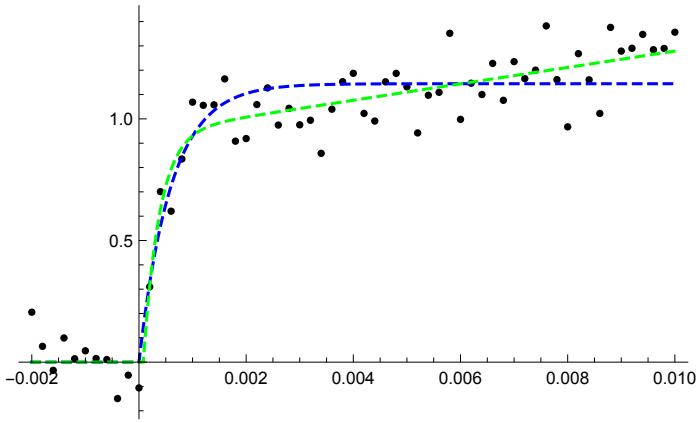


```
Mono: chi2 = 0.915233     d = 0.915233     a = 1.14449     t = 0.00059831

Bi: ratio chi2Mono/chi2Bi = 1.46853     d = 0.0000812991     a =
 20.9214     a1 = 0.943315     t1 =0.00030087     t2 = 0.586078

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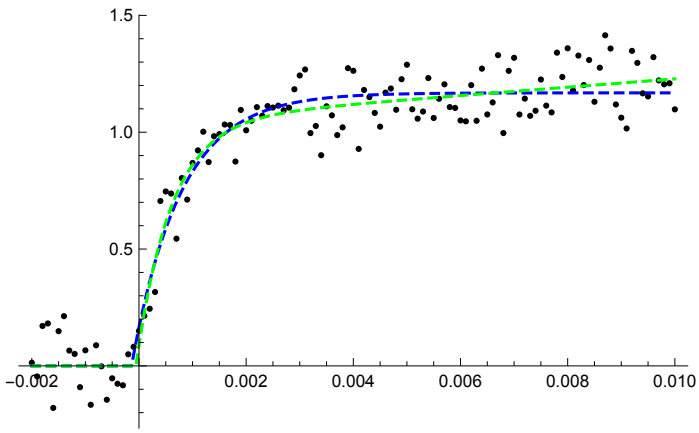


```
Mono: chi2 = 1.33551     d = 1.33551     a = 1.16839     t = 0.000914607
Bi: ratio chi2Mono/chi2Bi = 1.07645     d = -0.0000563097
      a = 6.3437     a1 = 1.04688     t1 =0.000648862     t2 = 0.288768
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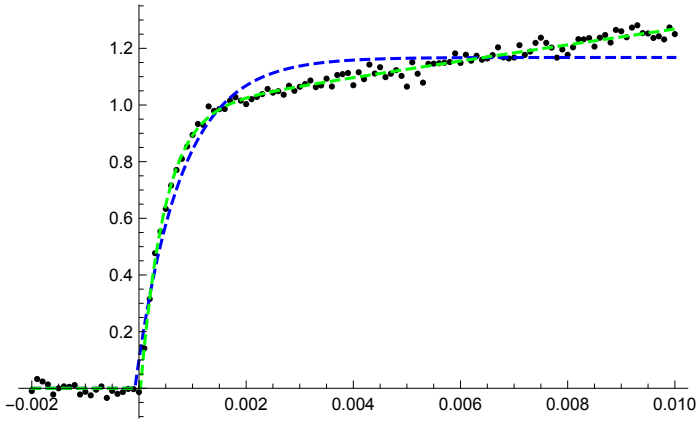


```
Mono: chi2 = 0.345323     d = 0.345323     a = 1.16781     t = 0.000842442
Bi: ratio chi2Mono/chi2Bi = 8.58629     d = 0.0000279089     a =
 3.48848     a1 = 0.97597     t1 =0.000451427     t2 = 0.0806754
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----------------     Ca = 16.4957
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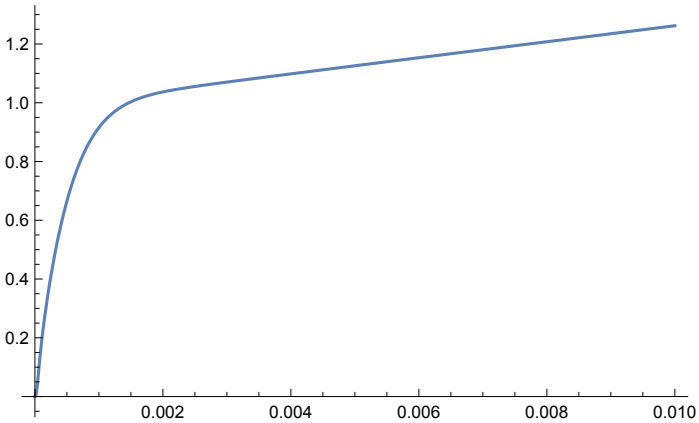

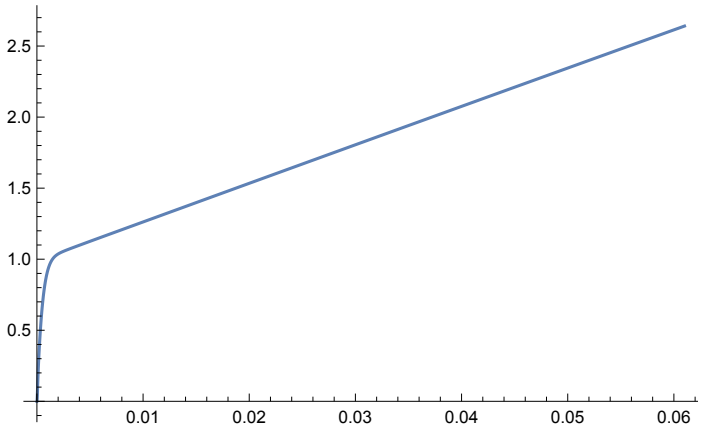

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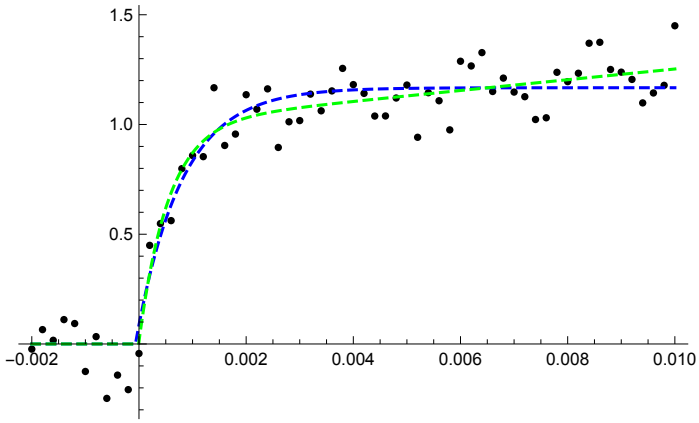

Mono: chi2 = 0.790127 d = 0.790127 a = 1.16749 t = 0.000851648

Bi: ratio chi2Mono/chi2Bi = 1.15492 d = -6.22593×10^{-6}

a = 8.63082 a1 = 1.00542 t1 =0.000547153 t2 = 0.30344

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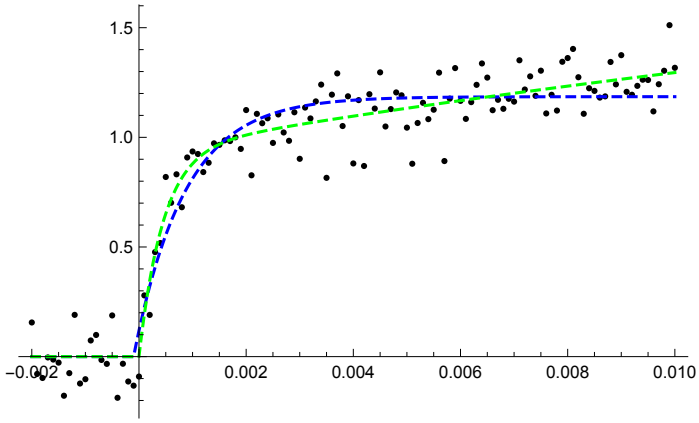

Mono: chi2 = 1.73654 d = 1.73654 a = 1.18538 t = 0.000951759

Bi: ratio chi2Mono/chi2Bi = 1.31463 d = 6.52232×10^{-16} a = 2.19243 a1 = 0.940455 t1 =0.000449636 t2 = 0.0300029

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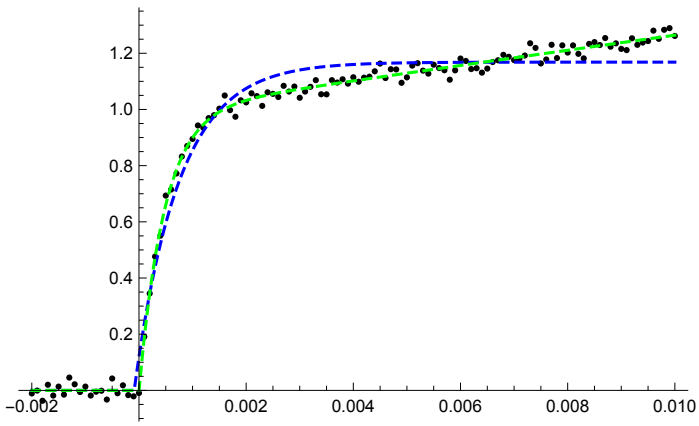

Mono: chi2 = 0.324448 d = 0.324448 a = 1.16842 t = 0.000827786

Bi: ratio chi2Mono/chi2Bi = 6.50618 d = 2.23127×10^{-6} a = 6.59933 a1 = 0.990678 t1 =0.000471222 t2 = 0.19981

--- Ca = 17.3163

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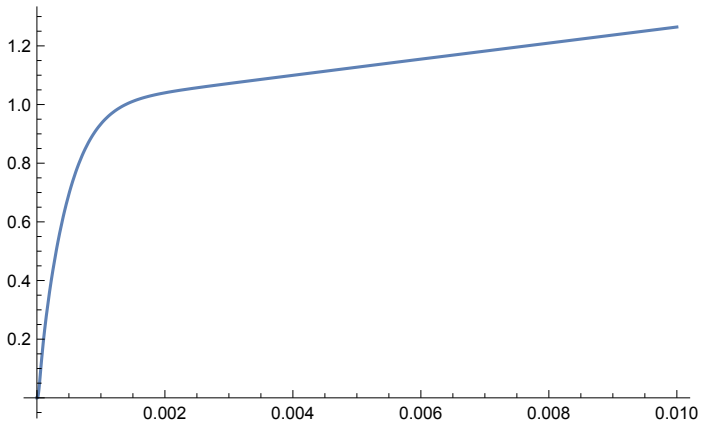

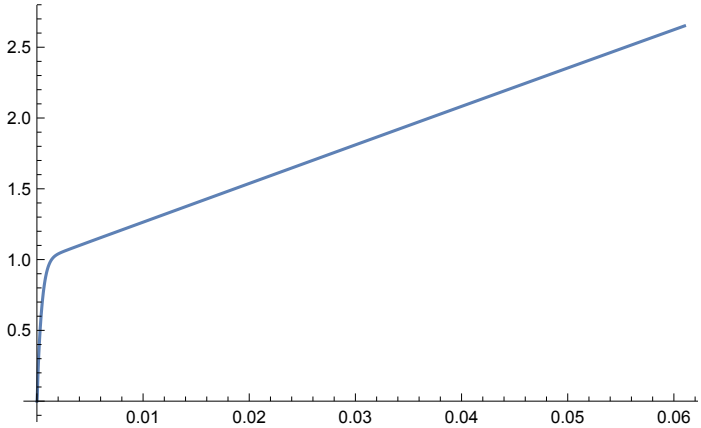

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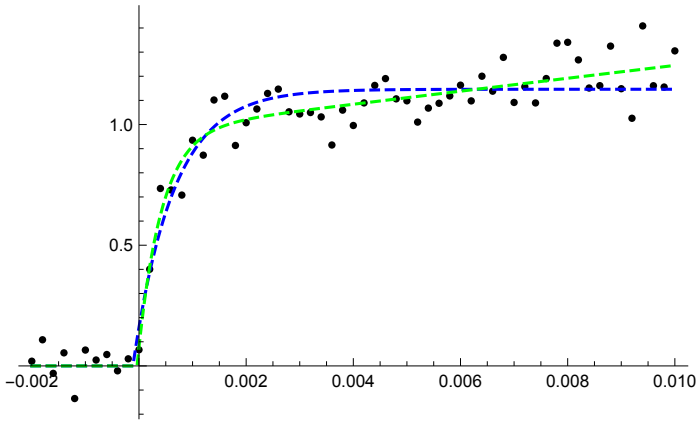


```
Mono: chi2 = 0.550573     d = 0.550573     a = 1.14613     t = 0.000757585
Bi: ratio chi2Mono/chi2Bi = 1.3788     d = -0.0000356404     a =
 8.40604     a1 = 0.97388     t1 =0.000438594     t2 = 0.270146
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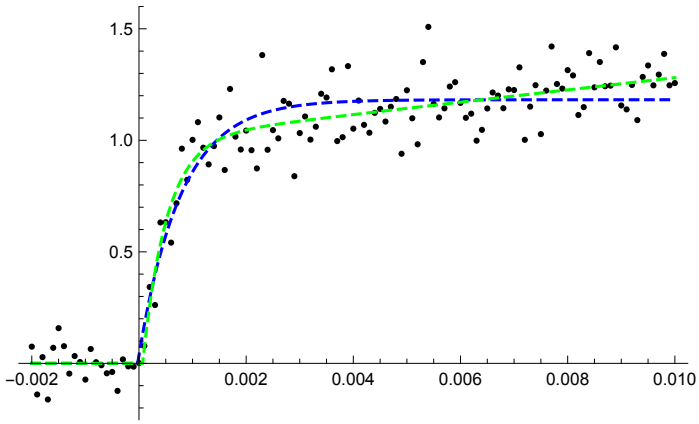


```
Mono: chi2 = 1.66271     d = 1.66271     a = 1.1819     t = 0.00078935
Bi: ratio chi2Mono/chi2Bi = 1.20961     d = 0.0000677627     a =
 7.33332     a1 = 1.00479     t1 =0.000449119     t2 = 0.222778
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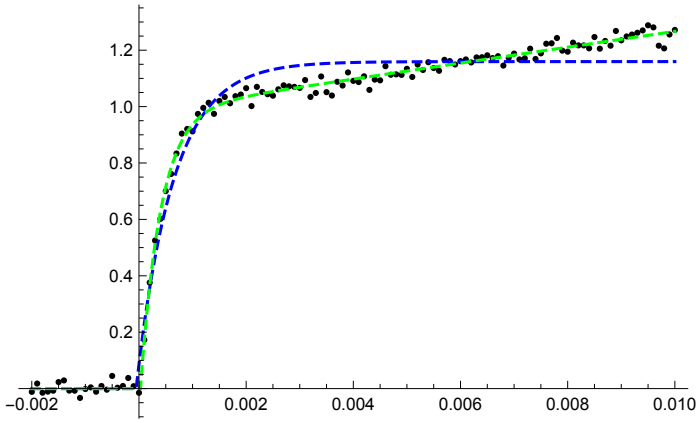


```
Mono: chi2 = 0.396376     d = 0.396376     a = 1.15956     t = 0.000686931
Bi: ratio chi2Mono/chi2Bi = 8.3319     d = 0.0000278129     a =
 7.74824     a1 = 0.983187     t1 =0.000378014     t2 = 0.232965
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----------------     Ca = 18.1821
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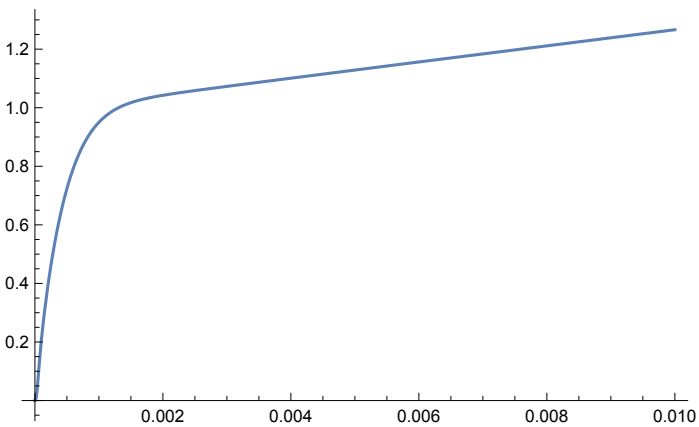

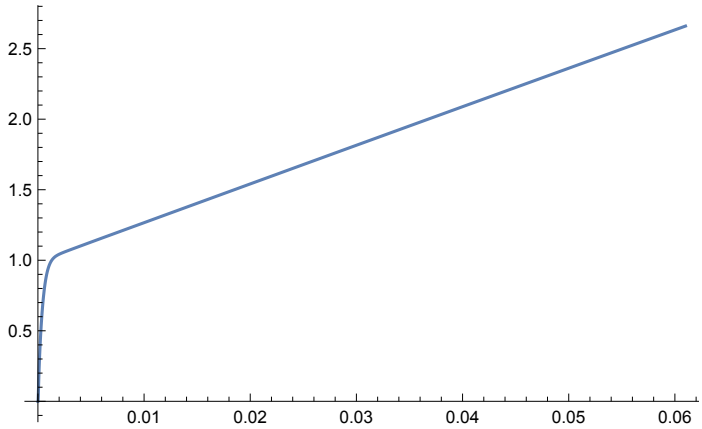

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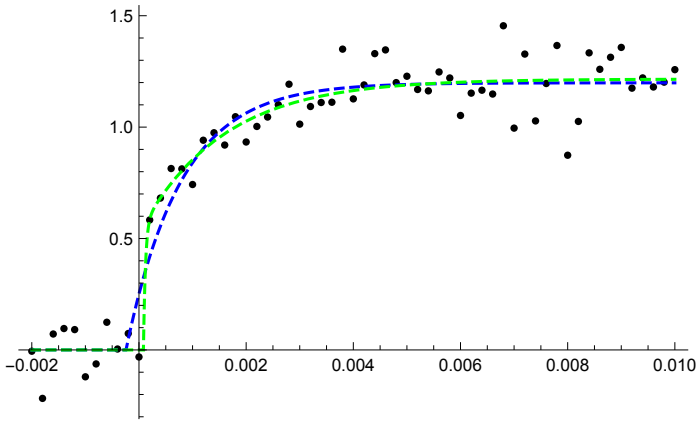


```
Mono: chi2 = 0.821565     d = 0.821565     a = 1.19878     t = 0.00102948
Bi: ratio chi2Mono/chi2Bi = 1.21681     d = 0.0000833976     a =
 1.21563     a1 = 0.560612     t1 =0.0000375208     t2 = 0.00154087
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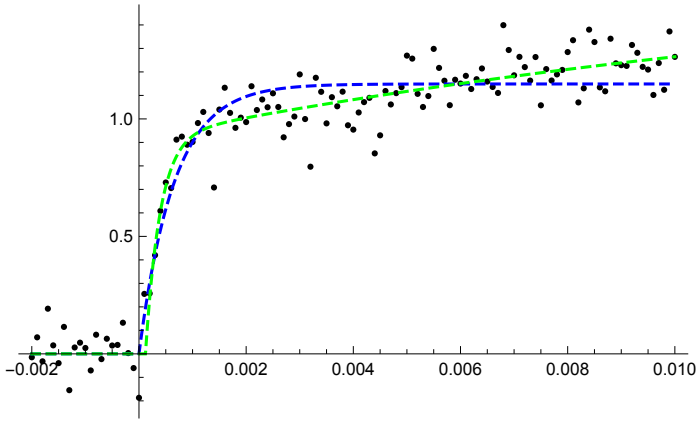


```
Mono: chi2 = 1.43882     d = 1.43882     a = 1.14873     t = 0.000651662
Bi: ratio chi2Mono/chi2Bi = 1.42113     d = 0.000121109     a =
 1.68772     a1 = 0.923982     t1 =0.000271329     t2 = 0.0167273
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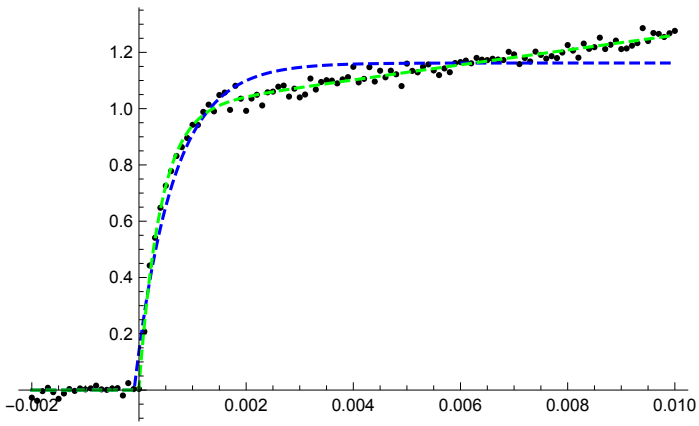
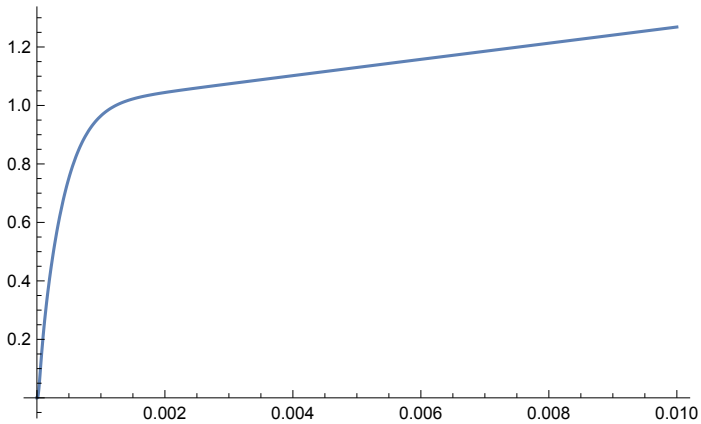


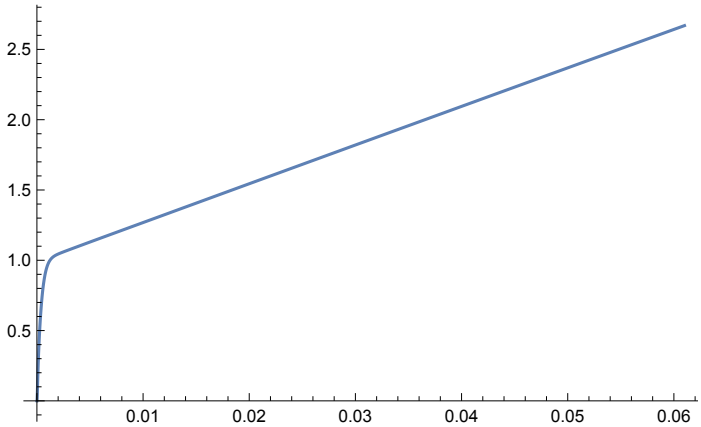
Mono: chi2 = 0.341447 d = 0.341447 a = 1.16215 t = 0.000716455

Bi: ratio chi2Mono/chi2Bi = 7.73335 d = -3.4236×10^{-6} a = 5.12964 a1 = 0.992837 t1 =0.000399388 t2 = 0.149482

---------- Ca = 19.0955

uM ----------





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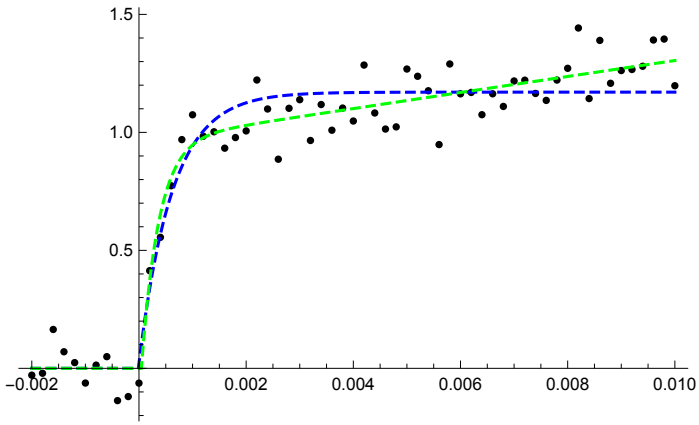


```
Mono: chi2 = 0.775165     d = 0.775165     a = 1.17049     t = 0.000618393

Bi: ratio chi2Mono/chi2Bi = 1.58065     d = 0.0000443503     a =
 13.7954     a1 = 0.964586     t1 =0.000325332     t2 = 0.370877

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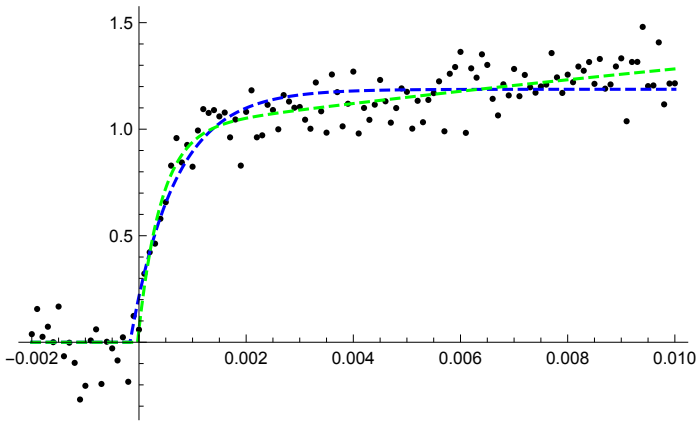


```
Mono: chi2 = 1.40494     d = 1.40494     a = 1.18728     t = 0.000832446
Bi: ratio chi2Mono/chi2Bi = 1.27604     d = -0.0000260907     a =
 2.12637     a1 = 0.994446     t1 =0.000424917     t2 = 0.0340748
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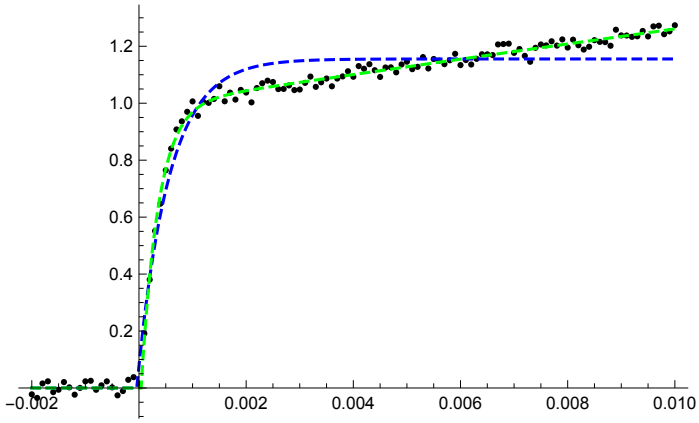


```
Mono: chi2 = 0.385201     d = 0.385201     a = 1.15543     t = 0.000588937
Bi: ratio chi2Mono/chi2Bi = 9.49116     d = 0.0000399385     a =
 5.20069     a1 = 0.991273     t1 =0.00031937     t2 = 0.150493
------------------------------------------------------------------------------------------
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----------------     Ca = 20.0596
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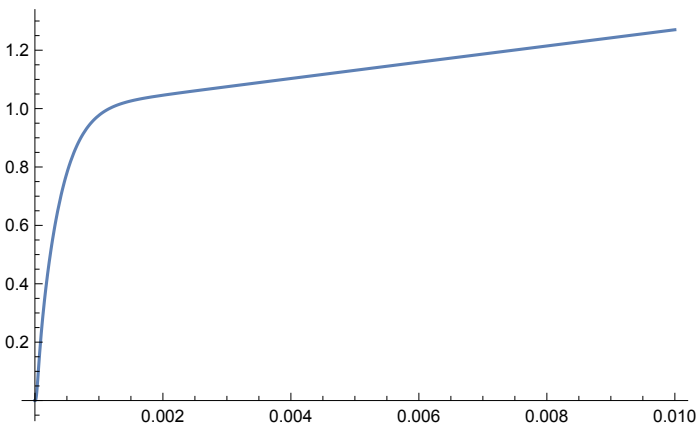

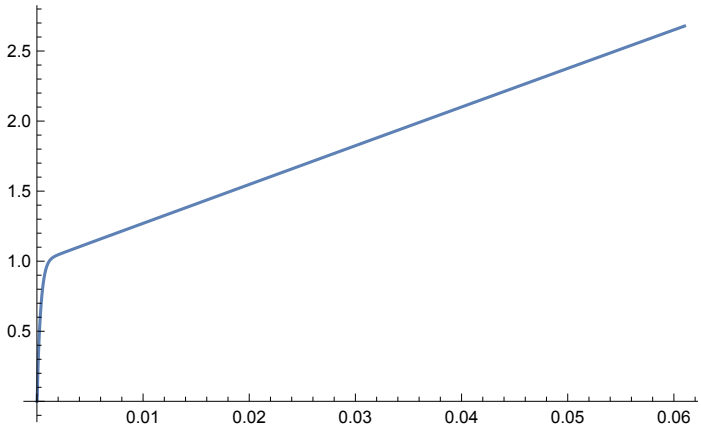

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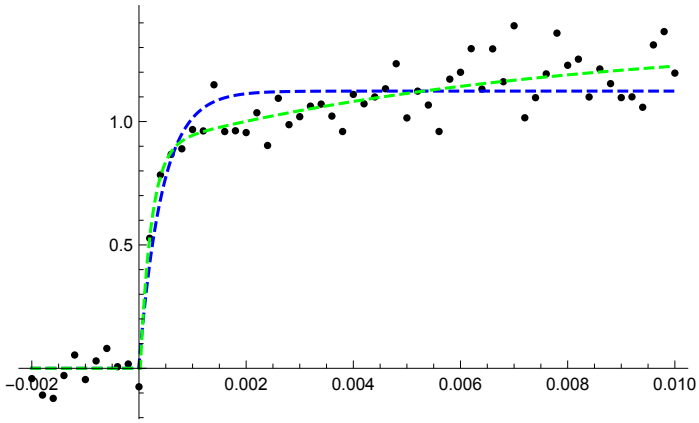


```
Mono: chi2 = 0.689421     d = 0.689421     a = 1.12347     t = 0.000430742
Bi: ratio chi2Mono/chi2Bi = 1.58895     d = 0.000023985     a =
 1.33638     a1 = 0.896474     t1 =0.000204454     t2 = 0.0072864
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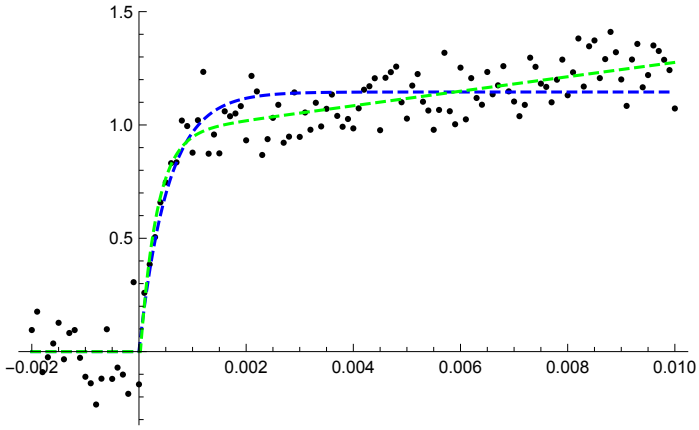


```
Mono: chi2 = 1.76305     d = 1.76305     a = 1.14538     t = 0.000537517
Bi: ratio chi2Mono/chi2Bi = 1.42907     d = 0.0000265125     a =
 9.93956     a1 = 0.955688     t1 =0.000308997     t2 = 0.274669
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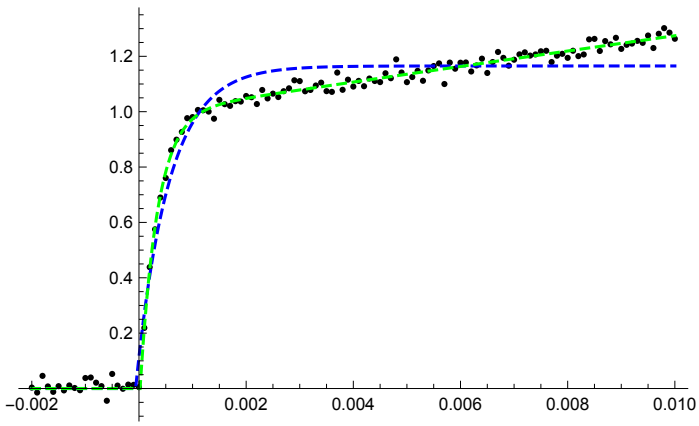

```
Mono: chi2 = 0.420763     d = 0.420763     a = 1.16512     t = 0.000612114
Bi: ratio chi2Mono/chi2Bi = 8.49924     d = 0.0000210003
      a = 6.3857     a1 = 0.992918     t1 =0.00032192     t2 = 0.18619
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----------------     Ca = 21.0761
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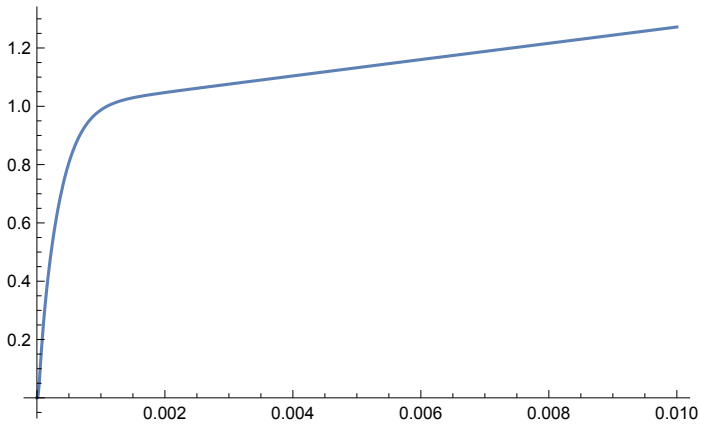

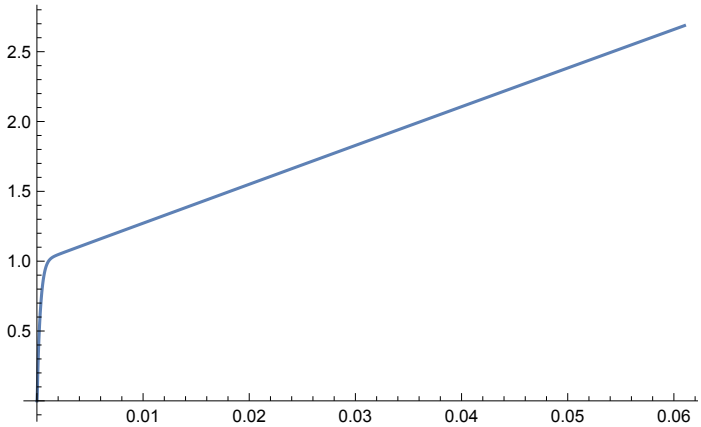


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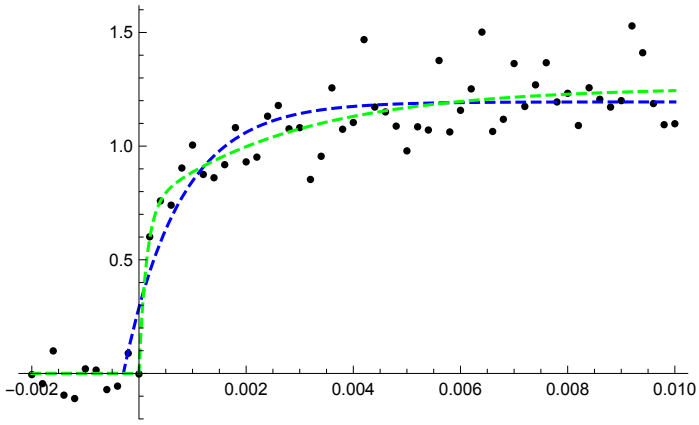

Mono: chi2 = 1.04375 d = 1.04375 a = 1.19445 t = 0.00104588

Bi: ratio chi2Mono/chi2Bi = 1.29364 d = 1.65527×10^{-17} a = 1.25929 a1 = 0.726843 t1 =0.000137877 t2 = 0.00281096

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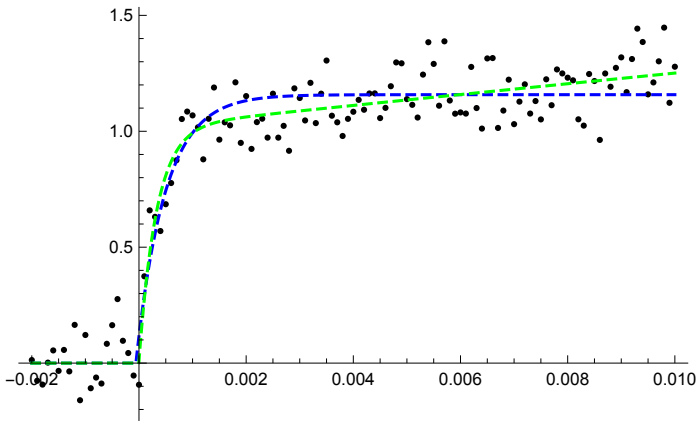

Mono: chi2 = 1.6395 d = 1.6395 a = 1.15789 t = 0.000541802

Bi: ratio chi2Mono/chi2Bi = 1.19547 d = -2.94004×10^{-6}

a = 5.3652 a1 = 1.01586 t1 =0.000327734 t2 = 0.179952

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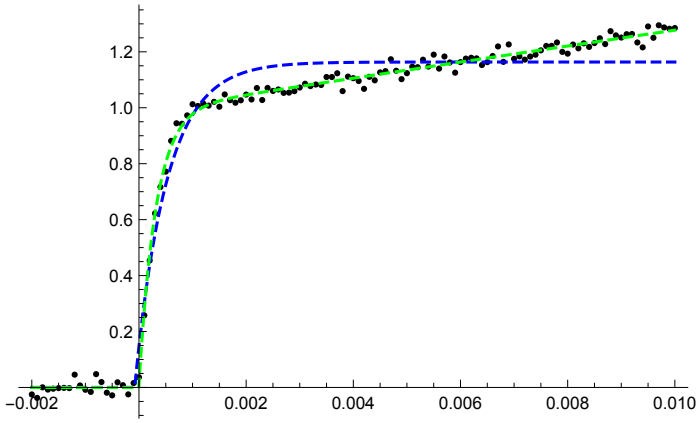
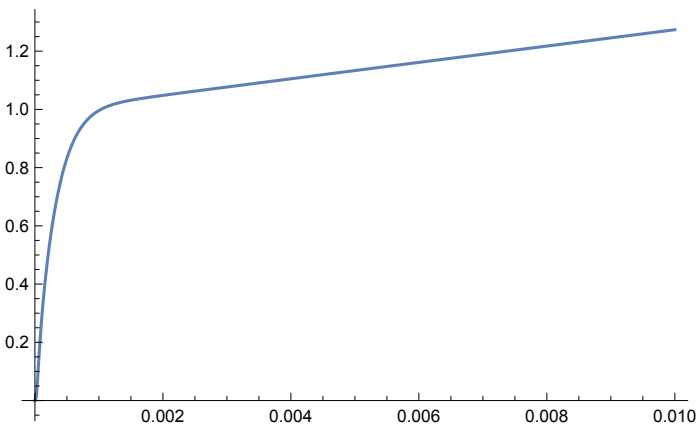


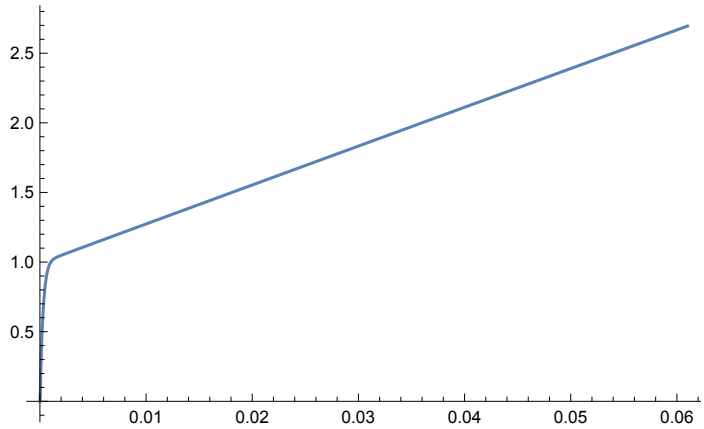
Mono: chi2 = 0.463679 d = 0.463679 a = 1.16347 t = 0.000594351

Bi: ratio chi2Mono/chi2Bi = 9.69344 d = -3.43075×10^{-6} a = 7.56514 a1 = 0.988233 t1 =0.000314655 t2 = 0.222443

---- Ca = 22.1498

uM ----------





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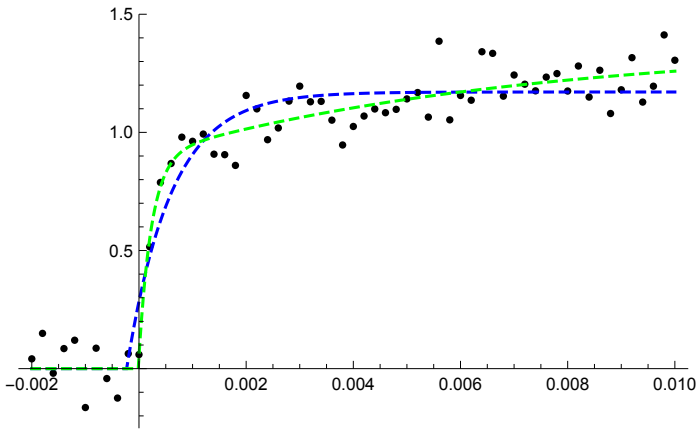


```
Mono: chi2 = 0.714734     d = 0.714734     a = 1.1709     t = 0.000826054
Bi: ratio chi2Mono/chi2Bi = 1.57046     d = -0.0000134092     a =
 1.37196     a1 = 0.894252     t1 =0.000234108     t2 = 0.00694582
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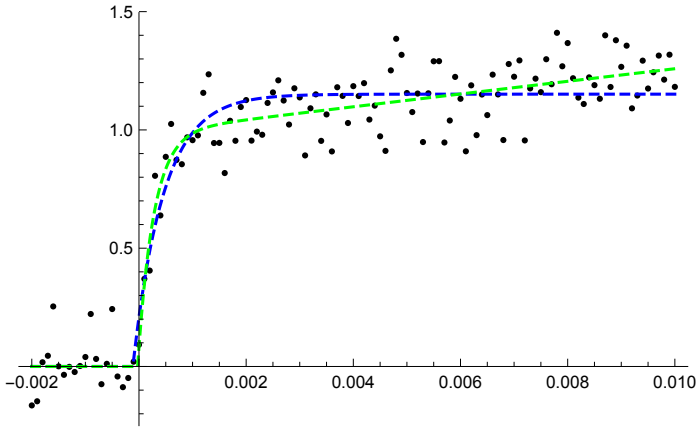


```
Mono: chi2 = 1.84448     d = 1.84448     a = 1.15114     t = 0.000569858
Bi: ratio chi2Mono/chi2Bi = 1.25002     d = -0.000025081     a =
 7.96835     a1 = 0.987746     t1 =0.000295477     t2 = 0.253292
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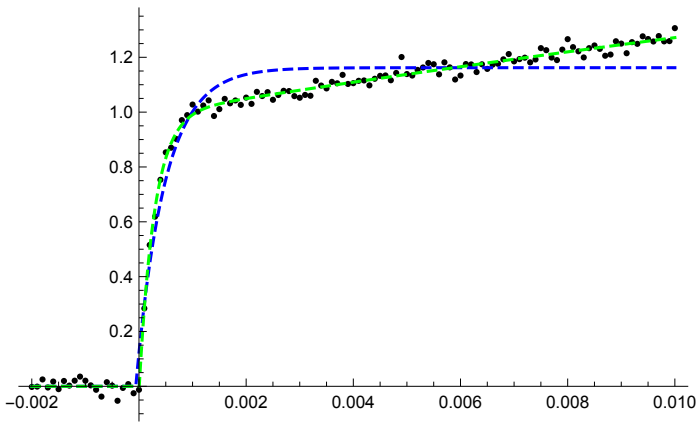
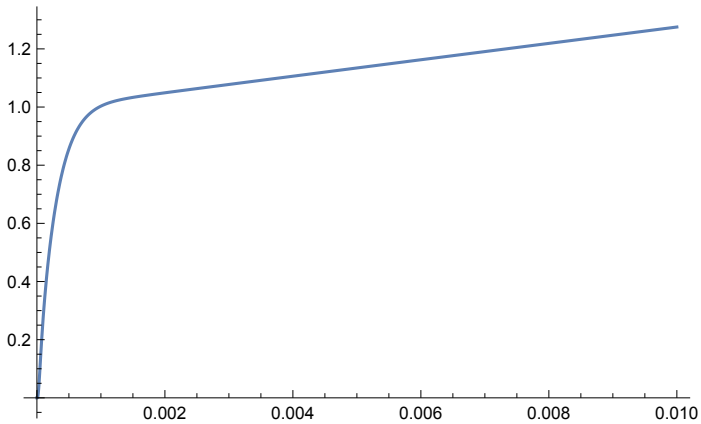
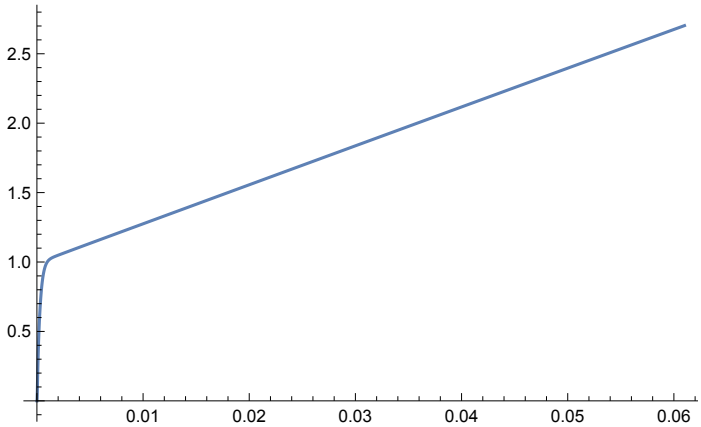


Mono: chi2 = 0.451355 d = 0.451355 a = 1.16202 t = 0.000534255

Bi: ratio chi2Mono/chi2Bi = 9.71914 d = 5.3287×10^{-6} a = 2.4818 a1 = 0.988843 t1 =0.000282993 t2 = 0.0475738

---------- Ca = 23.2819 uM ----------





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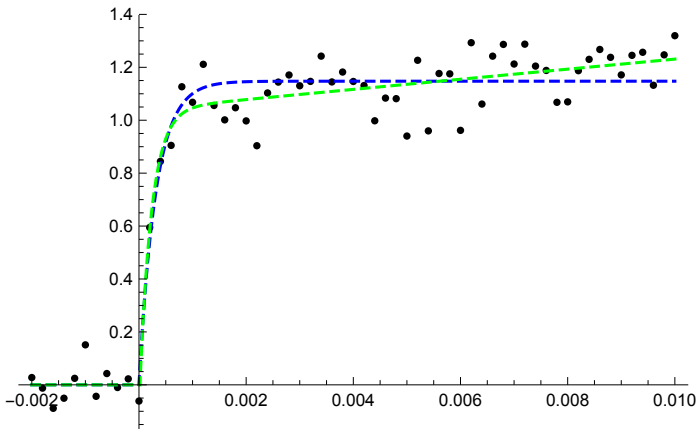


```
Mono: chi2 = 0.536243     d = 0.536243     a = 1.14747     t = 0.000313056

Bi: ratio chi2Mono/chi2Bi = 1.27217     d = 0.0000175863     a =
 9.55626     a1 = 1.0398     t1 =0.000222544     t2 = 0.439685

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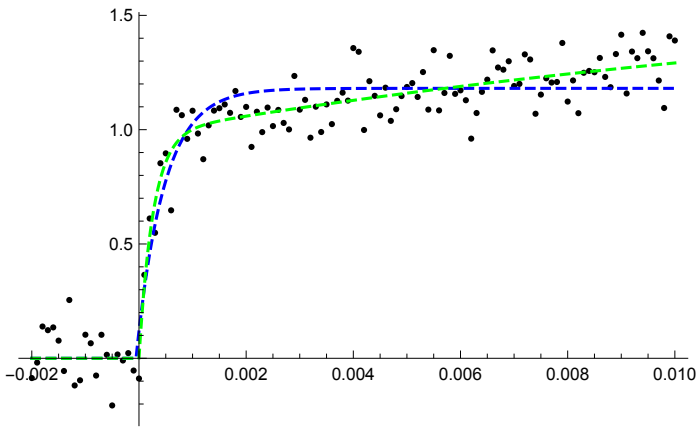

Mono: chi2 = 1.63686 d = 1.63686 a = 1.18074 t = 0.00051816

Bi: ratio chi2Mono/chi2Bi = 1.44764 d = 5.38956×10^{-18} a = 1.67967 a1 = 0.982512 t1 =0.000261769 t2 = 0.017054

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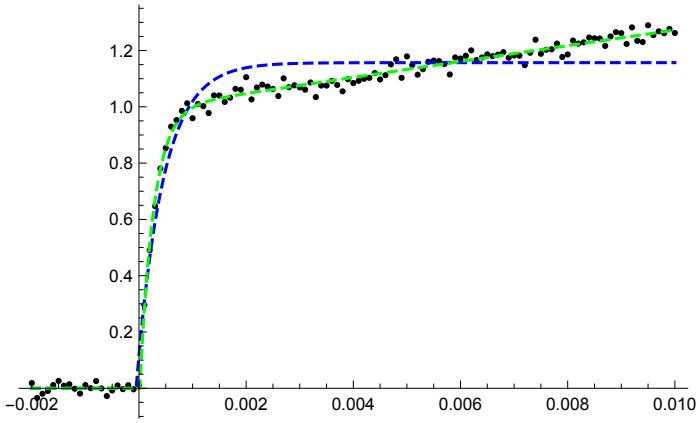


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Mono: chi2 = 0.478064     d = 0.478064     a = 1.15689     t = 0.000493787
Bi: ratio chi2Mono/chi2Bi = 9.46008     d = 0.000015524     a =
 7.2718     a1 = 0.990161     t1 =0.000257975     t2 = 0.216912
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----------------     Ca = 24.4782
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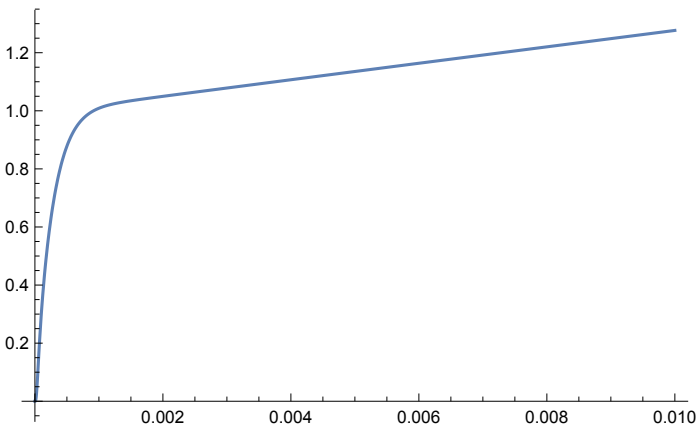

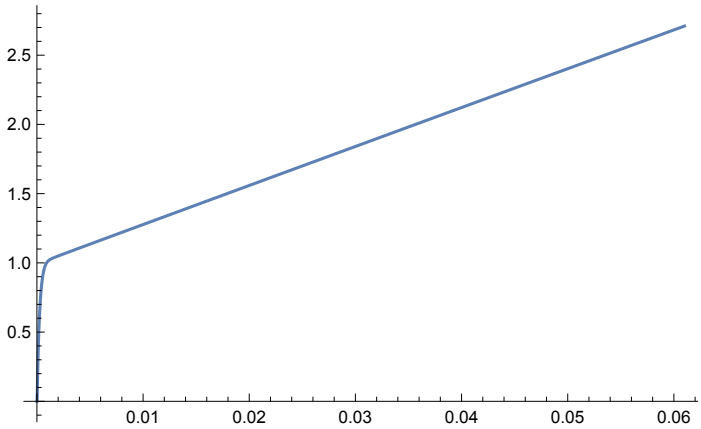

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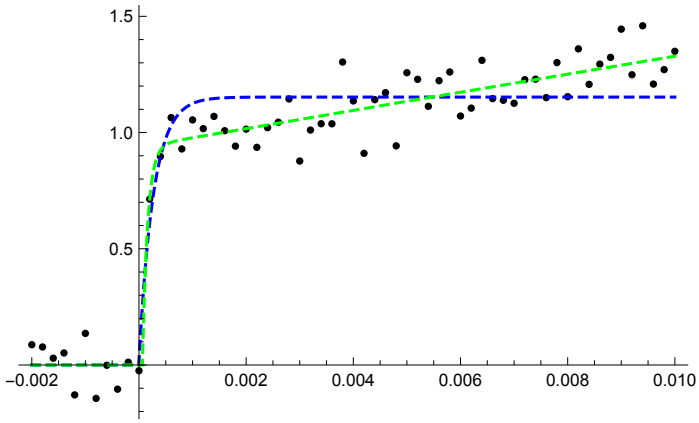


```
Mono: chi2 = 1.0002     d = 1.0002     a = 1.15258     t = 0.000269915
Bi: ratio chi2Mono/chi2Bi = 2.10262     d = 0.0000635887     a =
 17.2553     a1 = 0.940553     t1 =0.0000981281     t2 = 0.412994
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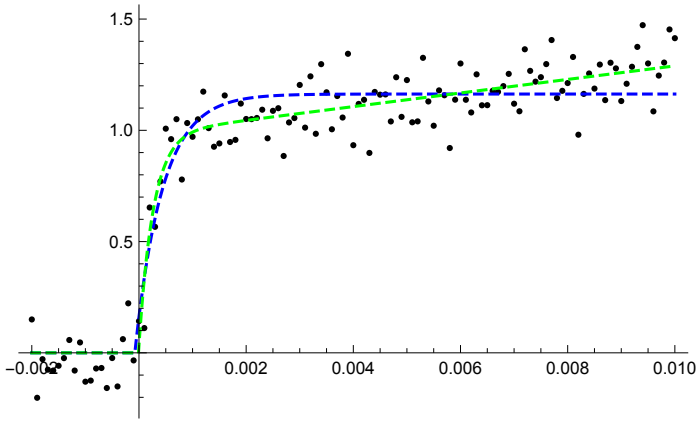

Mono: chi2 = 1.87871 d = 1.87871 a = 1.16303 t = 0.000513868

Bi: ratio chi2Mono/chi2Bi = 1.38504 d = -9.32433×10^{-6} a = 14.0527 a1 = 0.982902 t1 =0.000266983 t2 = 0.421793

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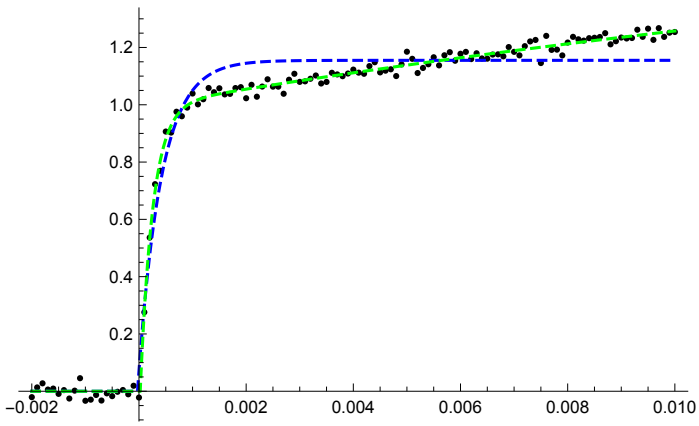

```
Mono: chi2 = 0.413466     d = 0.413466     a = 1.15506     t = 0.000428346
Bi: ratio chi2Mono/chi2Bi = 9.50556     d = 0.0000231917
      a = 1.8023     a1 = 0.993873     t1 =0.00023396     t2 = 0.02528
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----------------     Ca = 25.7412
  uM         -------------------------------------------------------
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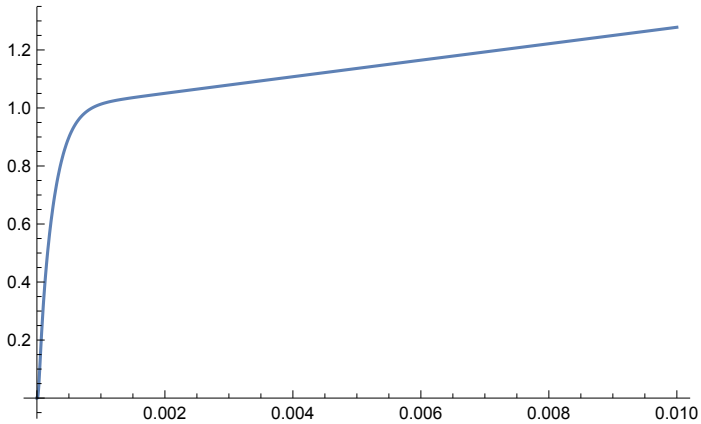

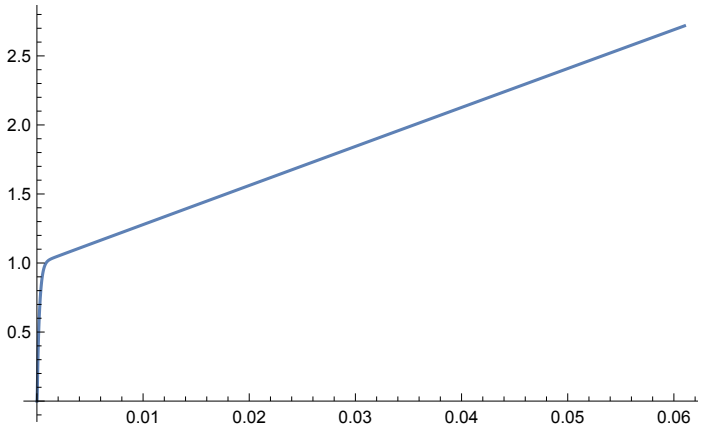


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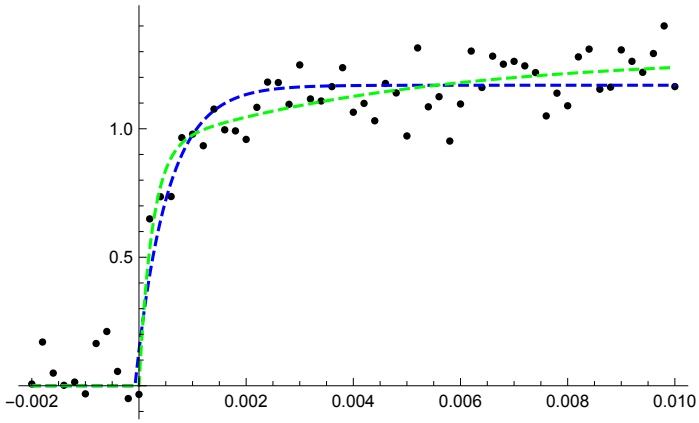

Mono: chi2 = 0.660508 d = 0.660508 a = 1.16933 t = 0.00059625

Bi: ratio chi2Mono/chi2Bi = 1.27412 d = 3.85421×10^{-17} a = 1.28541 a1 = 0.92434 t1 =0.000244249 t2 = 0.00489013

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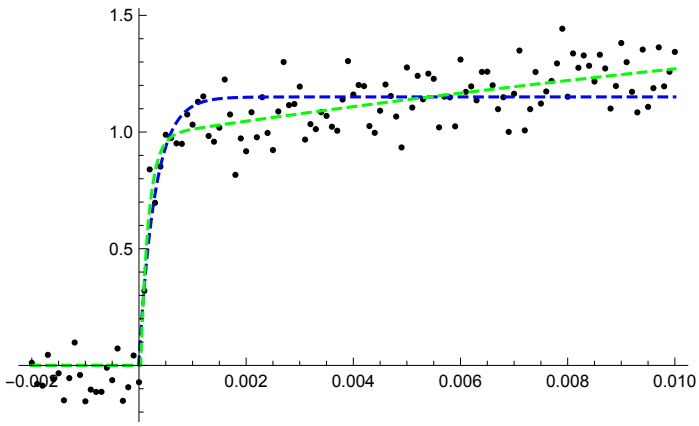


```
Mono: chi2 = 1.65385     d = 1.65385     a = 1.15053     t = 0.000299734
Bi: ratio chi2Mono/chi2Bi = 1.45176     d = 0.0000311816     a =
 1.92276     a1 = 0.980361     t1 =0.000148846     t2 = 0.0270528
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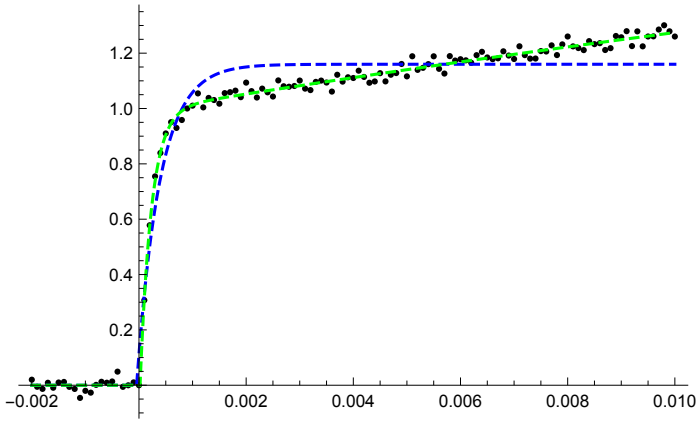


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Mono: chi2 = 0.488763     d = 0.488763     a = 1.1599     t = 0.000428751
Bi: ratio chi2Mono/chi2Bi = 11.1695     d = 0.0000203704     a =
 2.41065     a1 = 0.991043     t1 =0.000210739     t2 = 0.0448208
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----------------     Ca = 29.9583
  uM         -------------------------------------------------------
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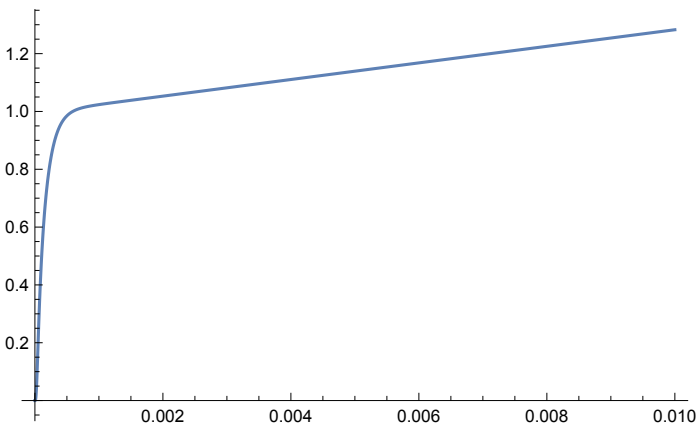

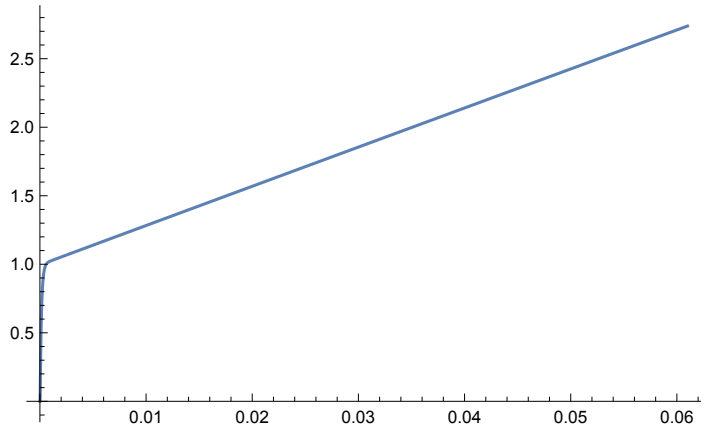

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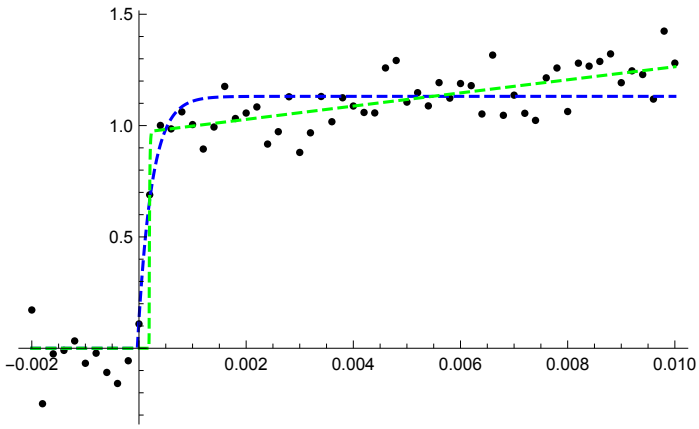

Mono: chi2 = 0.819951 d = 0.819951 a = 1.13125 t = 0.000260954

Bi: ratio chi2Mono/chi2Bi = 1.55288 d = 0.000188519 a = 10.5858 a1 = 0.973518 t1 = 9.3424×10^{-6} t2 = 0.31949

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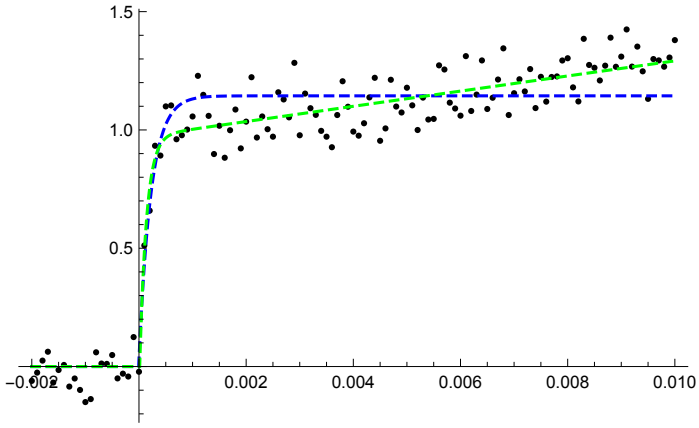


```
Mono: chi2 = 1.6255     d = 1.6255     a = 1.1441     t = 0.000225497
Bi: ratio chi2Mono/chi2Bi = 1.79915     d = 0.0000135585     a =
 16.4074     a1 = 0.971037     t1 =0.000126729     t2 = 0.475519
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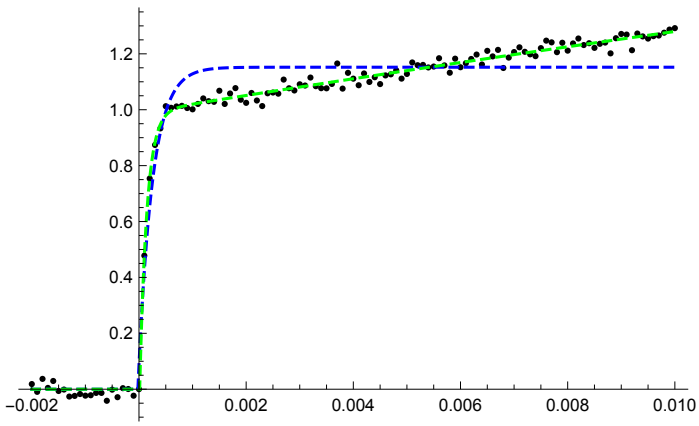

```
Mono: chi2 = 0.605239     d = 0.605239     a = 1.15209     t = 0.000262749
Bi: ratio chi2Mono/chi2Bi = 13.0707     d = 0.000013042     a =
 3.06864     a1 = 0.989749     t1 =0.000133291     t2 = 0.066448
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----------------     Ca = 31.4124
  uM         -------------------------------------------------------
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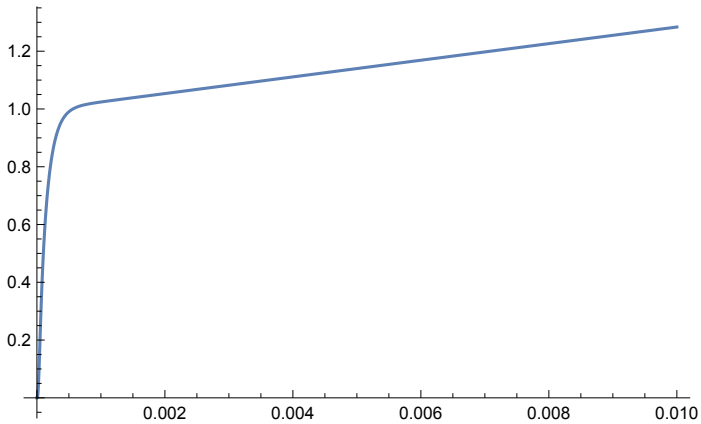

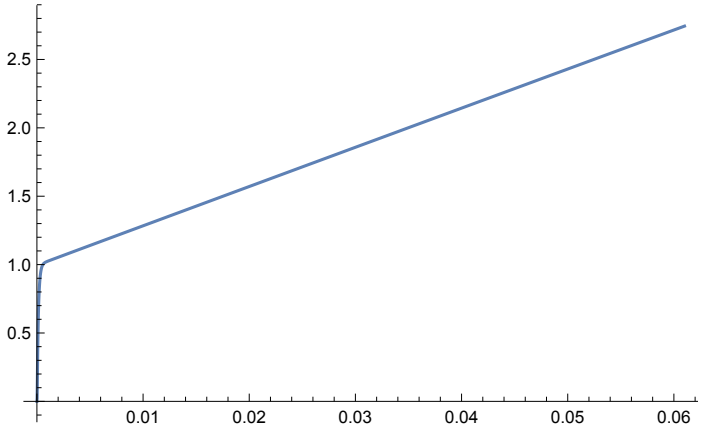


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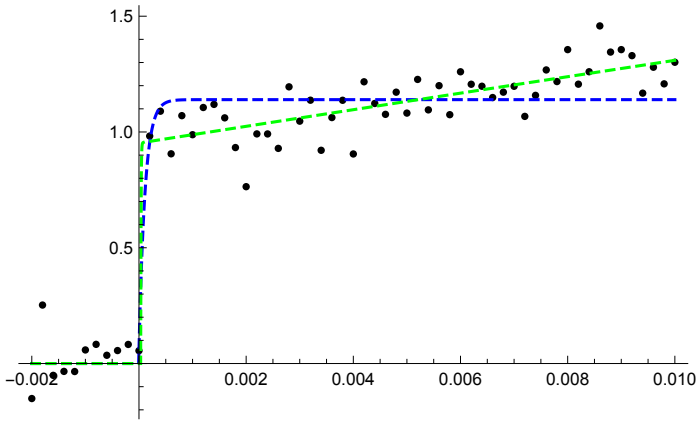

Mono: chi2 = 1.02465 d = 1.02465 a = 1.13964 t = 0.000113519

Bi: ratio chi2Mono/chi2Bi = 1.95501 d = 0.0000327354 a = 13.3624 a1 = 0.953274 t1 = 5.89434×10^{-6} t2 = 0.34233

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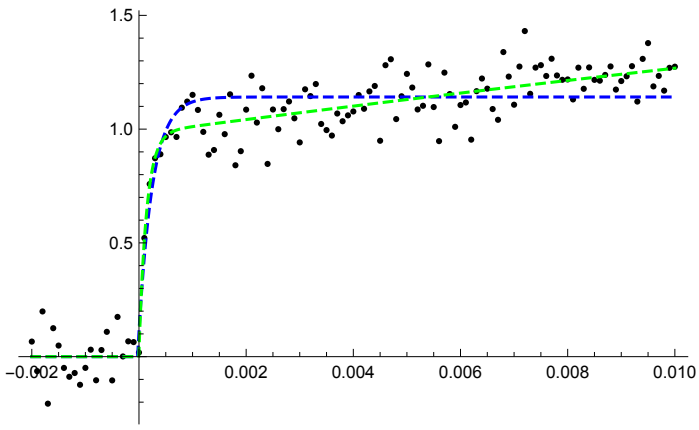

Mono: chi2 = 1.59905 d = 1.59905 a = 1.14122 t = 0.00025818

Bi: ratio chi2Mono/chi2Bi = 1.52488 d = -3.24995×10^{-6} a = 2.98265 a1 = 0.981018 t1 =0.000141927 t2 = 0.0646934

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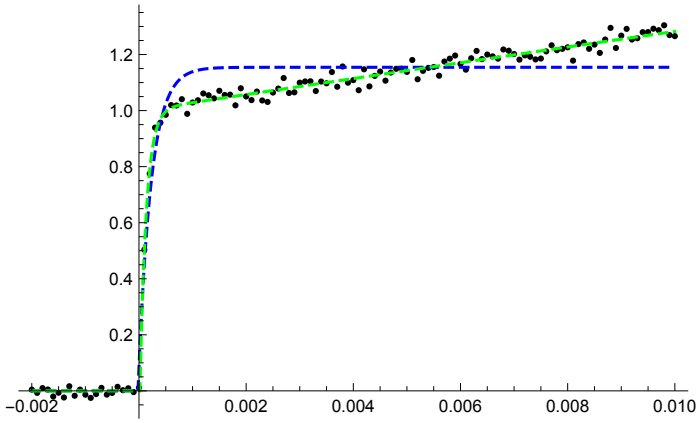


```
Mono: chi2 = 0.58898     d = 0.58898     a = 1.15447     t = 0.000237004
Bi: ratio chi2Mono/chi2Bi = 12.3599     d = 0.0000170492     a =
 7.50429     a1 = 1.00029     t1 =0.000120031     t2 = 0.225127
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 32.938
  uM         -------------------------------------------------------
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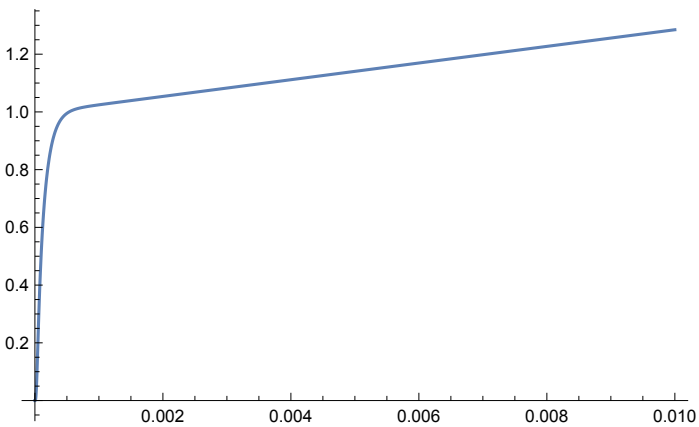

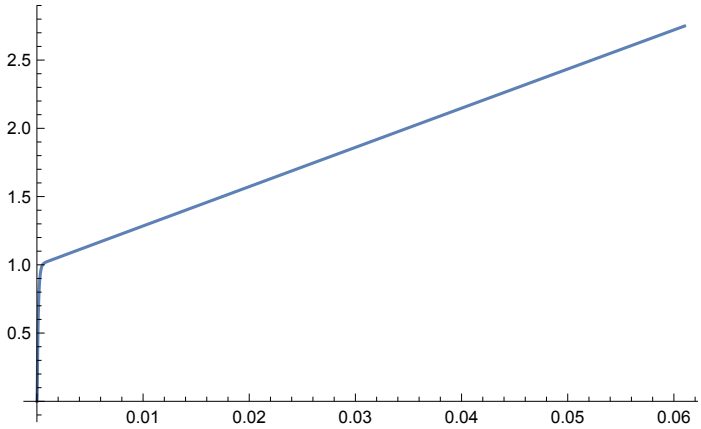

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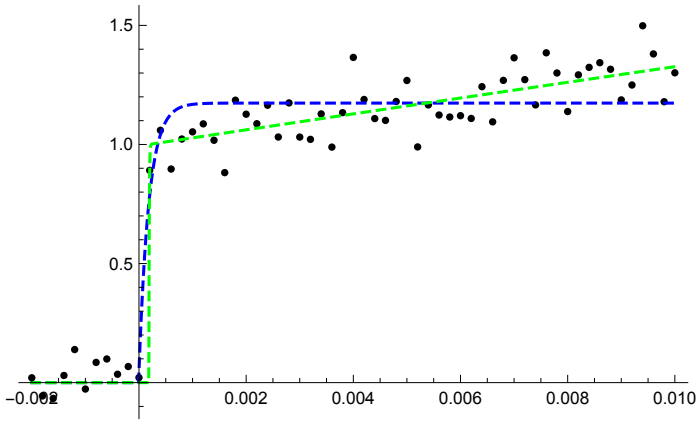

Mono: chi2 = 0.862806 d = 0.862806 a = 1.17377 t = 0.0001871

Bi: ratio chi2Mono/chi2Bi = 1.87994 d = 0.000184335 a = 10.1311 a1 = 1.00012 t1 = 7.07725×10^{-6} t2 = 0.26957

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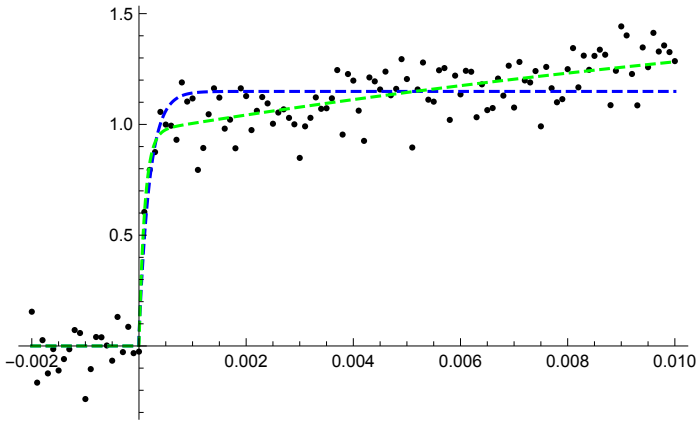

Mono: chi2 = 1.84923 d = 1.84923 a = 1.14889 t = 0.000197931

Bi: ratio chi2Mono/chi2Bi = 1.6098 d = -4.08343×10^{-18} a = 1.7508 a1 = 0.965119 t1 =0.000106957 t2 = 0.0193162

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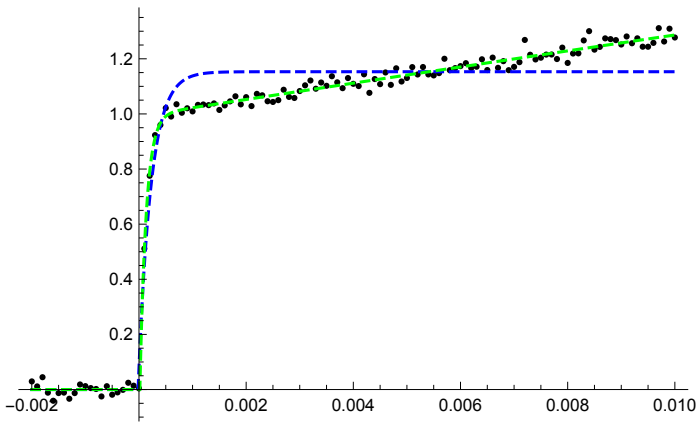

```
Mono: chi2 = 0.64079     d = 0.64079     a = 1.15311     t = 0.000235262
Bi: ratio chi2Mono/chi2Bi = 12.6254     d = 0.0000163755     a =
 7.94587     a1 = 0.993082     t1 =0.000117738     t2 = 0.231621
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----------------     Ca = 34.5385
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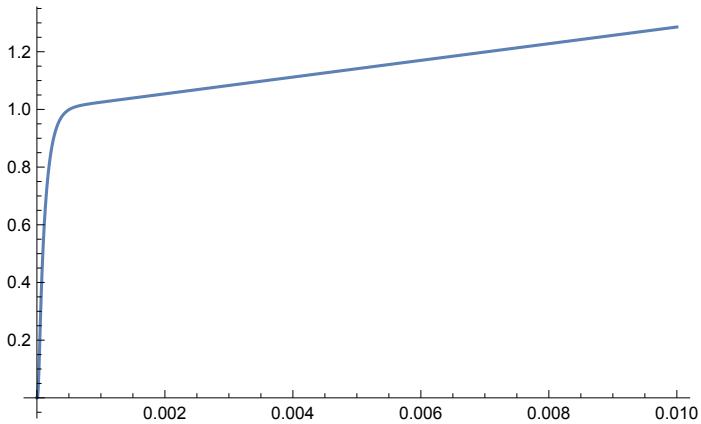

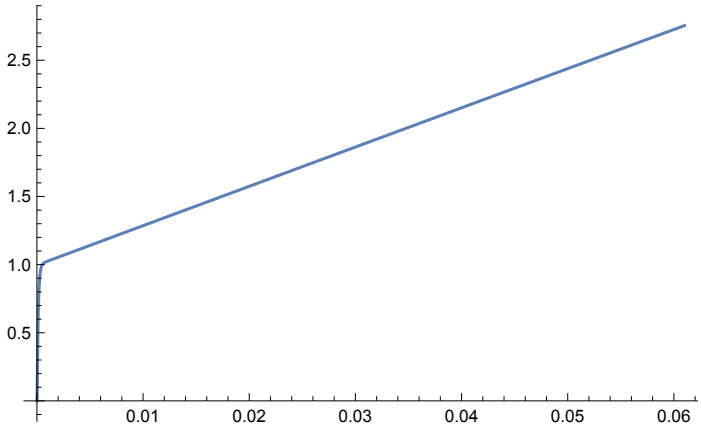


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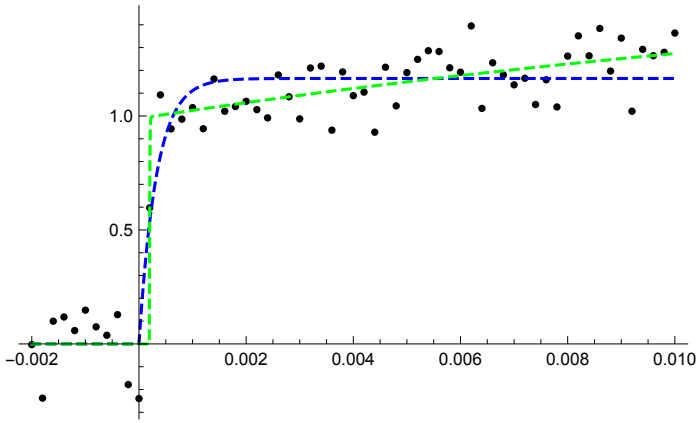

Mono: chi2 = 0.990384 d = 0.990384 a = 1.16447 t = 0.000324567

Bi: ratio chi2Mono/chi2Bi = 1.41698 d = 0.000194411 a = 1.69754 a1 = 0.995975 t1 = 6.11644×10^{-6} t2 = 0.0194364

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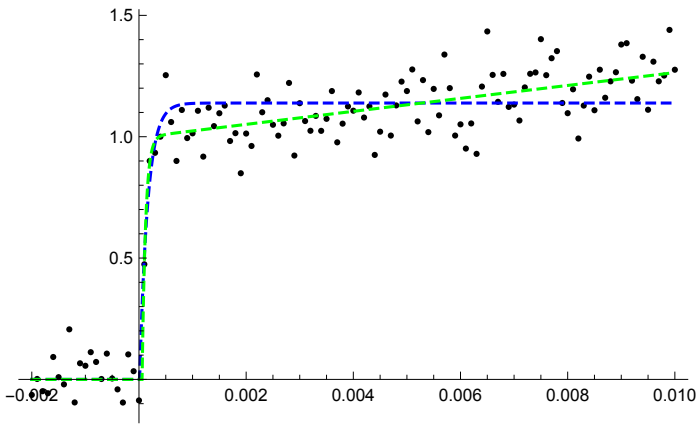


```
Mono: chi2 = 1.70795     d = 1.70795     a = 1.13875     t = 0.000149855
Bi: ratio chi2Mono/chi2Bi = 1.44704     d = 0.0000581584     a =
 12.099     a1 = 0.998415     t1 =0.0000650266     t2 = 0.410331
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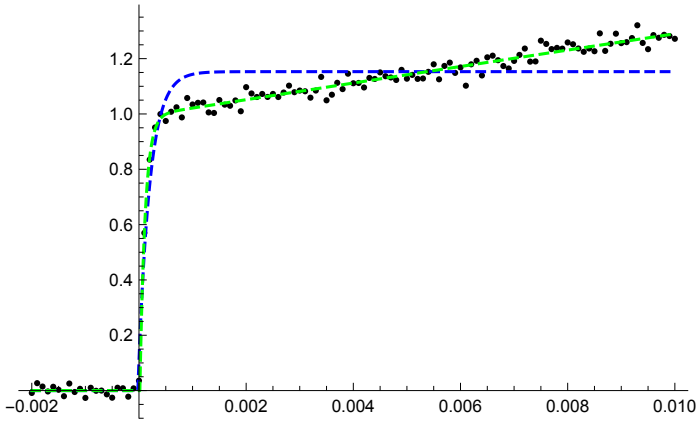


```
Mono: chi2 = 0.679103     d = 0.679103     a = 1.15294     t = 0.000213446
Bi: ratio chi2Mono/chi2Bi = 12.1551     d = 0.0000165089     a =
 9.79904     a1 = 0.991464     t1 =0.0000987121     t2 = 0.289642
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----------------     Ca = 36.2174
  uM         -------------------------------------------------------
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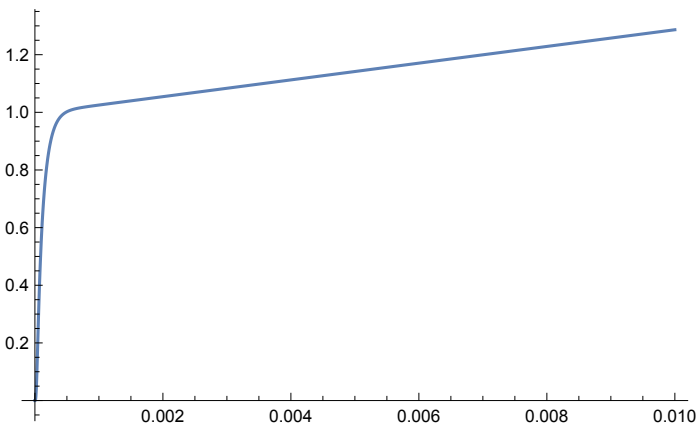

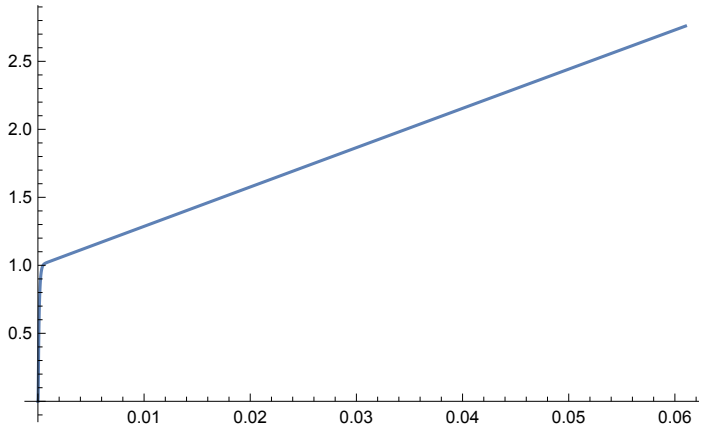

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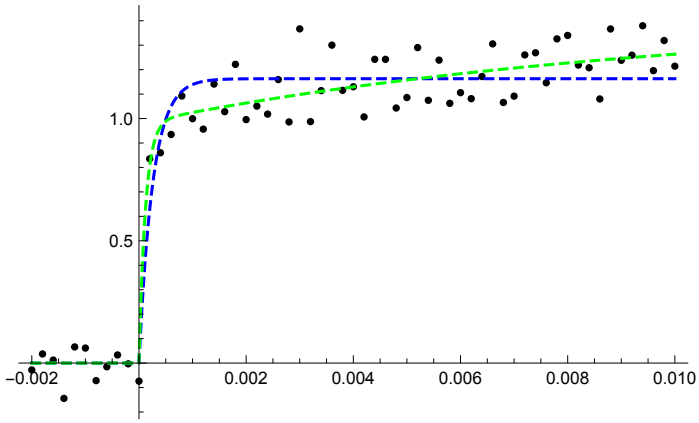

Mono: chi2 = 0.7356 d = 0.7356 a = 1.16292 t = 0.0002575

Bi: ratio chi2Mono/chi2Bi = 1.43581 d = -1.32269×10^{-17} a = 1.42268 a1 = 0.982544 t1 =0.000120238 t2 = 0.0098543

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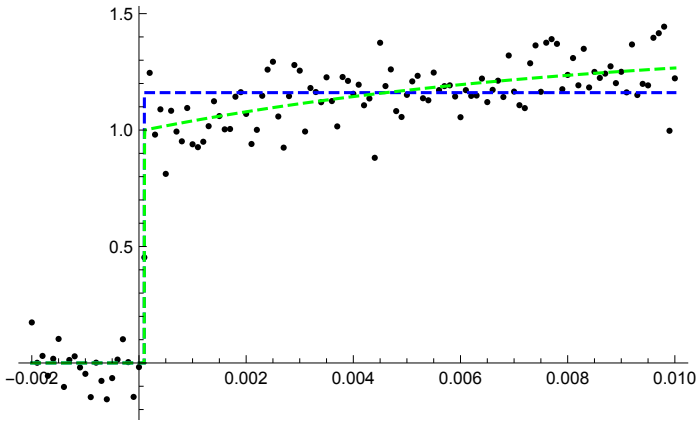

Mono: chi2 = 1.70049 d = 1.70049 a = 1.16077 t = 1.366×10^{-7}

Bi: ratio chi2Mono/chi2Bi = 1.49851 d = 0.0000989433 a = 1.38084 a1 = 0.999945 t1 =1.75052×10^{-6} t2 = 0.00822195

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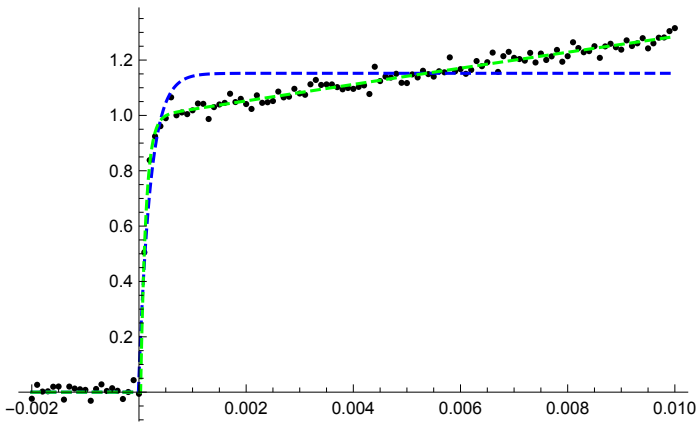

```
Mono: chi2 = 0.63664     d = 0.63664     a = 1.15218     t = 0.000214822
Bi: ratio chi2Mono/chi2Bi = 13.9808     d = 0.0000305091     a =
 4.34548     a1 = 0.99251     t1 =0.000097484     t2 = 0.109302
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----------------     Ca = 37.9787
  uM         -------------------------------------------------------
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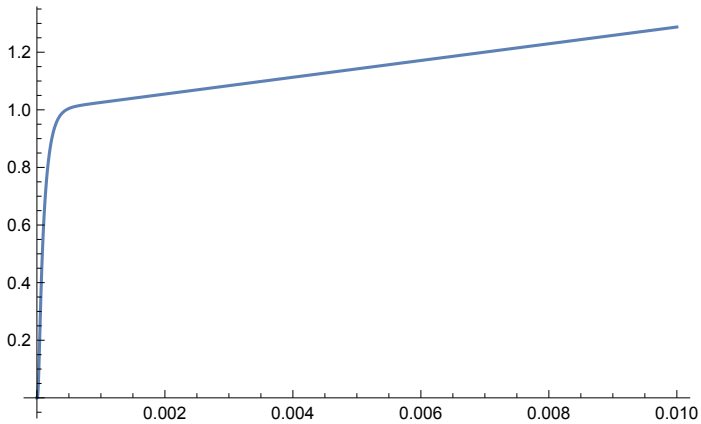

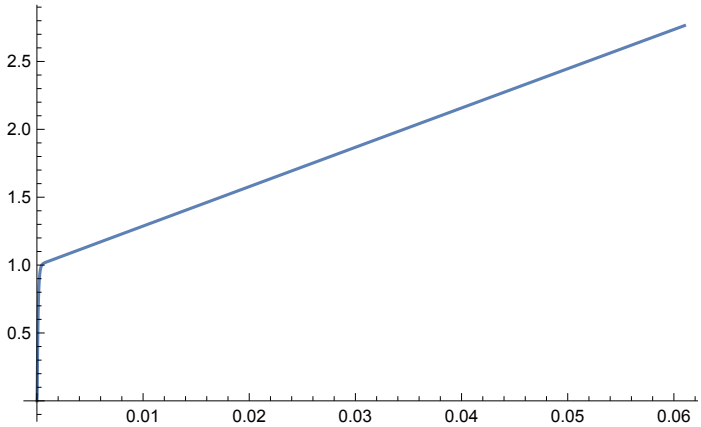


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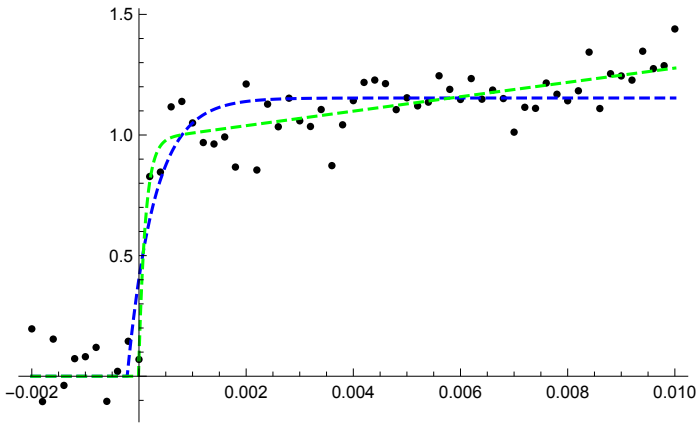

Mono: chi2 = 0.939716 d = 0.939716 a = 1.15342 t = 0.000506464

Bi: ratio chi2Mono/chi2Bi = 1.79697 d = -9.31672×10^{-6} a = 11.4099 a1 = 0.977872 t1 =0.000123677 t2 = 0.343544

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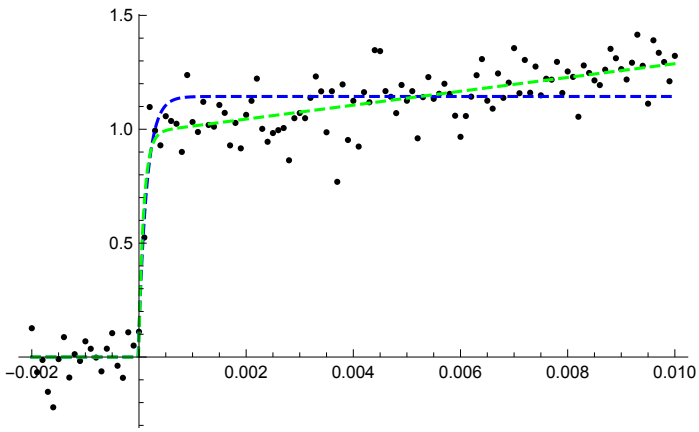

Mono: chi2 = 1.81403 d = 1.81403 a = 1.14389 t = 0.000152627

Bi: ratio chi2Mono/chi2Bi = 1.62406 d = -8.31834×10^{-6} a = 12.9684 a1 = 0.982758 t1 =0.0000929863 t2 = 0.38836

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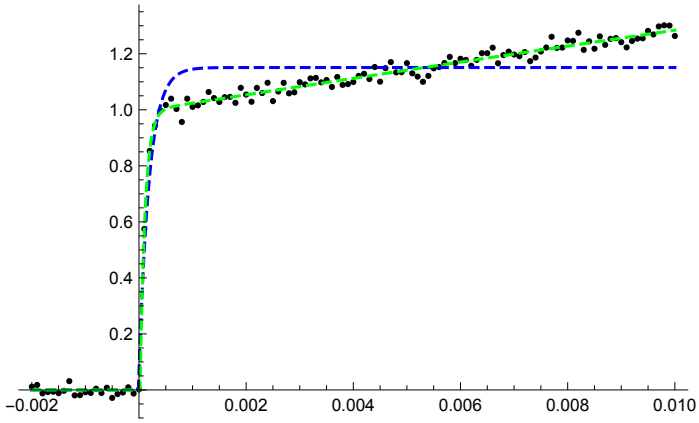


```
Mono: chi2 = 0.639816     d = 0.639816     a = 1.15089     t = 0.000191907
Bi: ratio chi2Mono/chi2Bi = 14.5037     d = 0.00001961     a =
 5.3006     a1 = 0.994327     t1 =0.00009396     t2 = 0.14332
-------------------------------------------------------------------------------------
  --------------------------
----------------     Ca = 39.8264
  uM          -------------------------------------------------------
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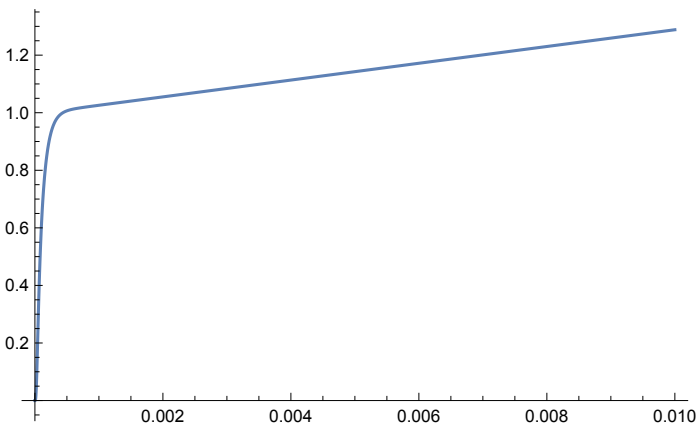

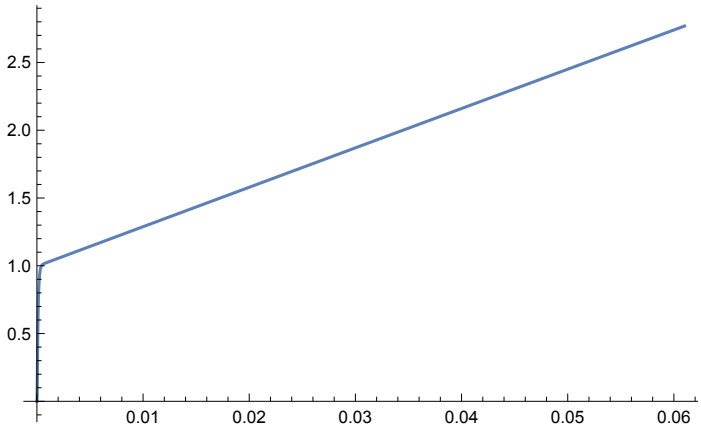

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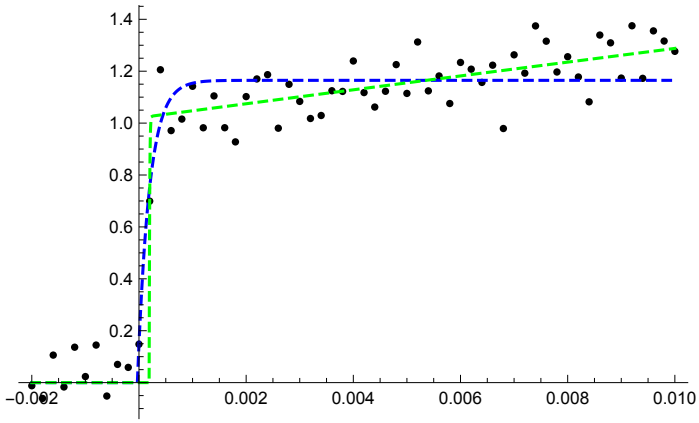

Mono: chi2 = 0.720007 d = 0.720007 a = 1.16478 t = 0.000220863

Bi: ratio chi2Mono/chi2Bi = 1.60643 d = 0.000190535 a = 10.2797 a1 = 1.02559 t1 = 8.27305×10^{-6} t2 = 0.341253

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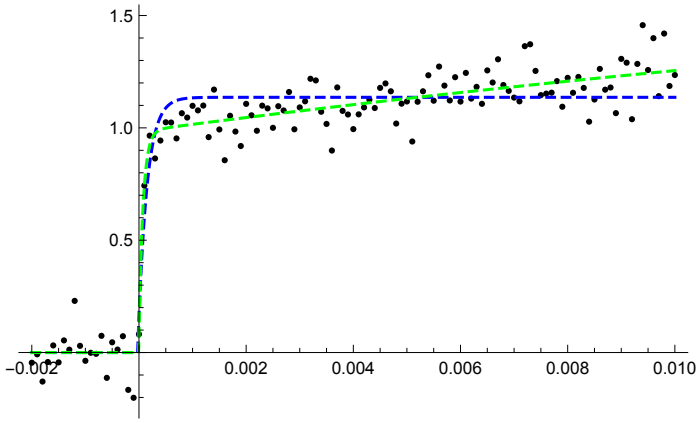

Mono: chi2 = 1.42824 d = 1.42824 a = 1.13598 t = 0.000165615

Bi: ratio chi2Mono/chi2Bi = 1.58172 d = -6.88763×10^{-6} a = 1.95036 a1 = 0.984217 t1 =0.0000778016 t2 = 0.0304458

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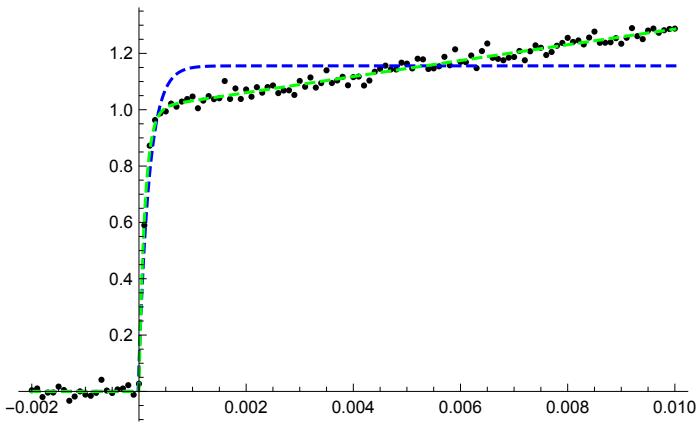

```
Mono: chi2 = 0.61152     d = 0.61152     a = 1.15571     t = 0.000194908
Bi: ratio chi2Mono/chi2Bi = 16.1208     d = -2.46317 × 10^-6
      a = 6.4532     a1 = 1.00249     t1 =0.000109431     t2 = 0.187145
-------------------------------------------------------------------------------------
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----------------     Ca = 41.7651
  uM         -------------------------------------------------------
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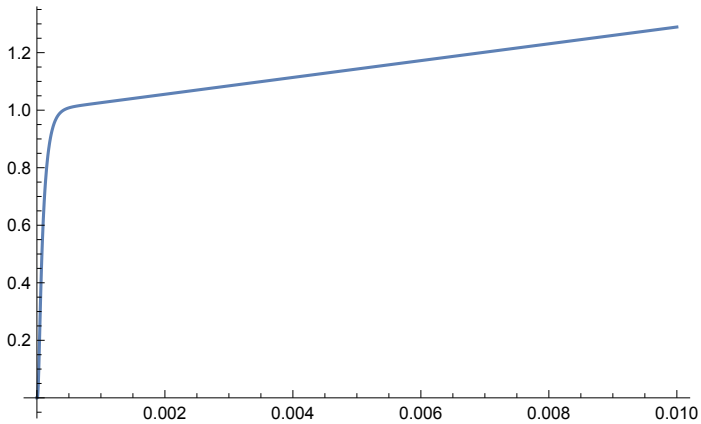

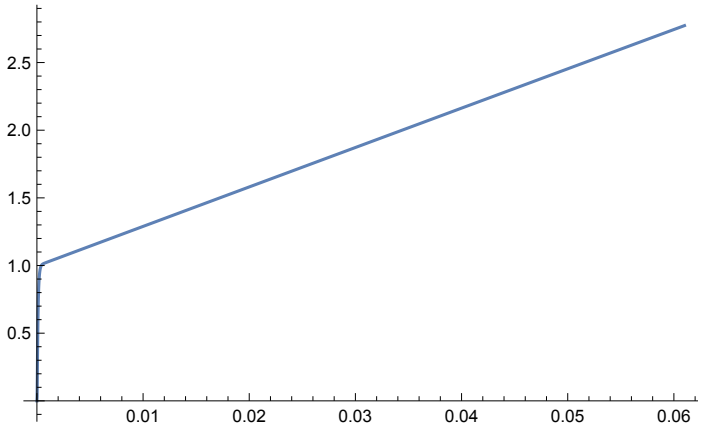


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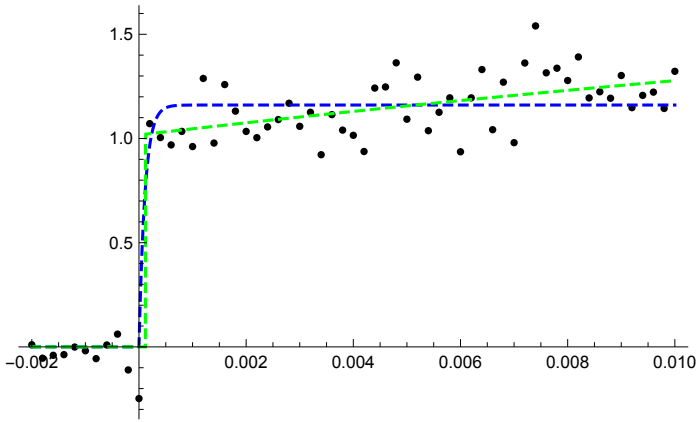

Mono: chi2 = 1.07654 d = 1.07654 a = 1.16059 t = 0.000112291

Bi: ratio chi2Mono/chi2Bi = 1.34032 d = 0.000121167 a = 2.08746 a1 = 1.0207 t1 = 5.46363×10^{-7} t2 = 0.0358682

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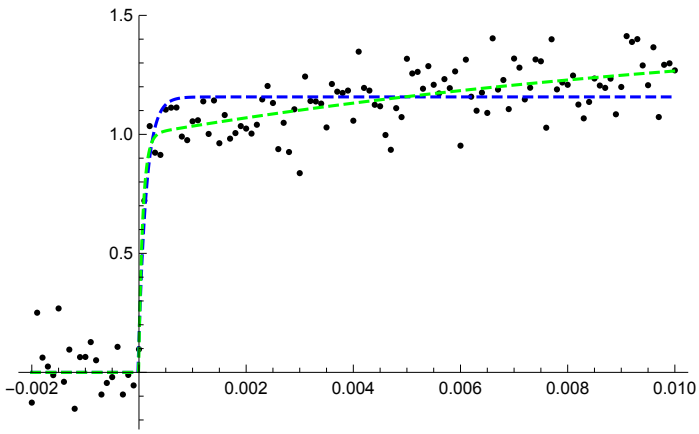

Mono: chi2 = 1.72087 d = 1.72087 a = 1.15738 t = 0.000144888

Bi: ratio chi2Mono/chi2Bi = 1.43129 d = -7.50756×10^{-6} a = 1.48063 a1 = 0.996401 t1 =0.0000767416 t2 = 0.0122741

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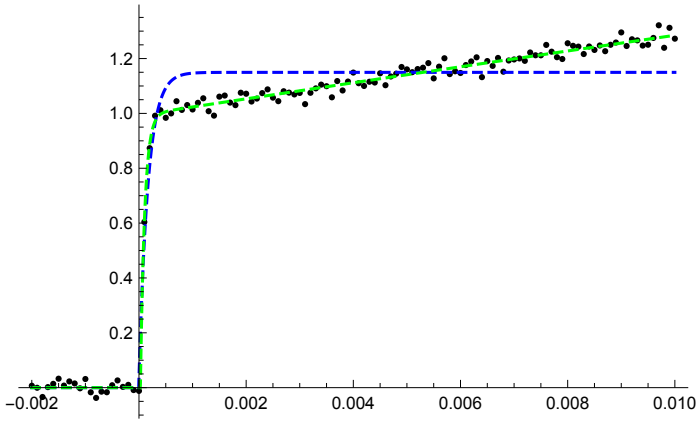


```
Mono: chi2 = 0.660596     d = 0.660596     a = 1.14964     t = 0.000168338
Bi: ratio chi2Mono/chi2Bi = 13.2116     d = 0.0000261814     a =
 7.48282     a1 = 0.994552     t1 =0.0000798895     t2 = 0.217954
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----------------     Ca = 43.7978
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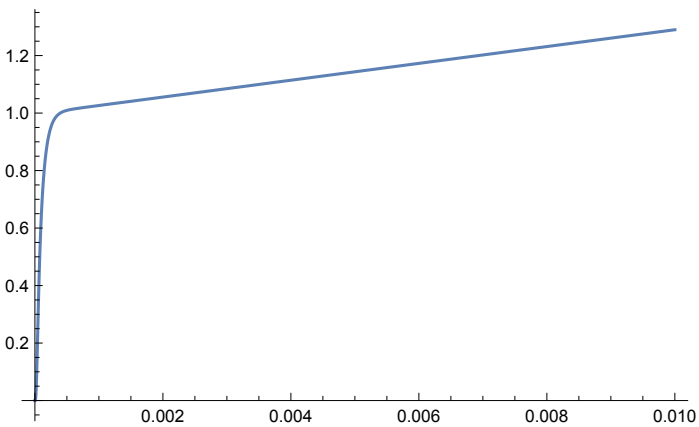

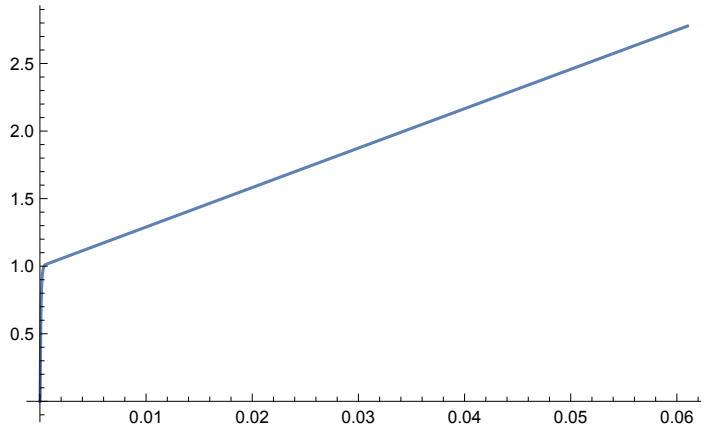

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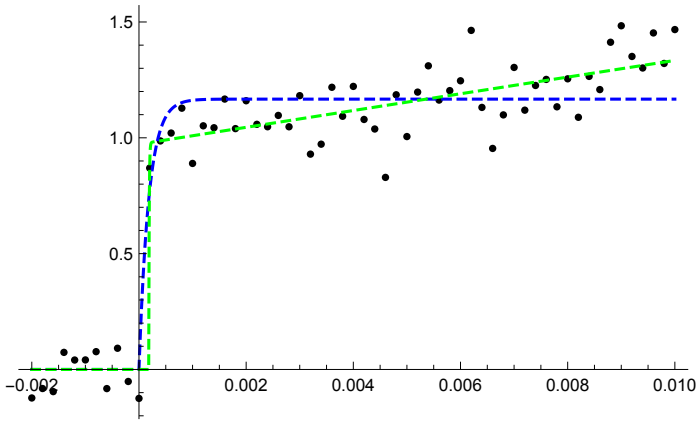

Mono: chi2 = 1.1704 d = 1.1704 a = 1.16696 t = 0.000183936

Bi: ratio chi2Mono/chi2Bi = 1.68828 d = 0.000182459 a = 21.4858 a1 = 0.979103 t1 =8.03647×10^{-6} t2 = 0.562416

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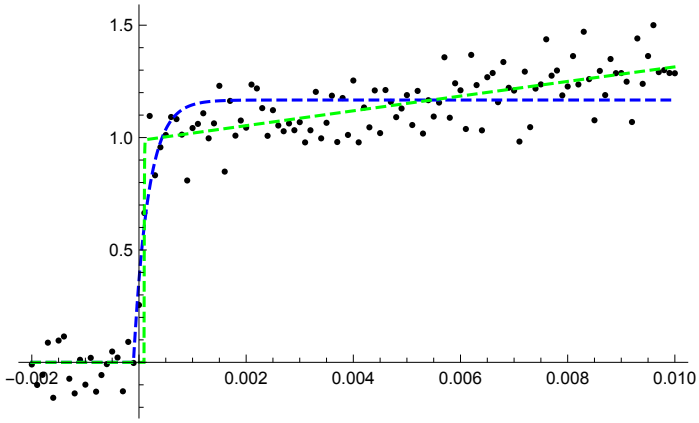

Mono: chi2 = 1.90147 d = 1.90147 a = 1.16709 t = 0.000275426

Bi: ratio chi2Mono/chi2Bi = 1.57775 d = 0.0000952279 a = 11.1487 a1 = 0.989712 t1 =4.29196×10^{-6} t2 = 0.304701

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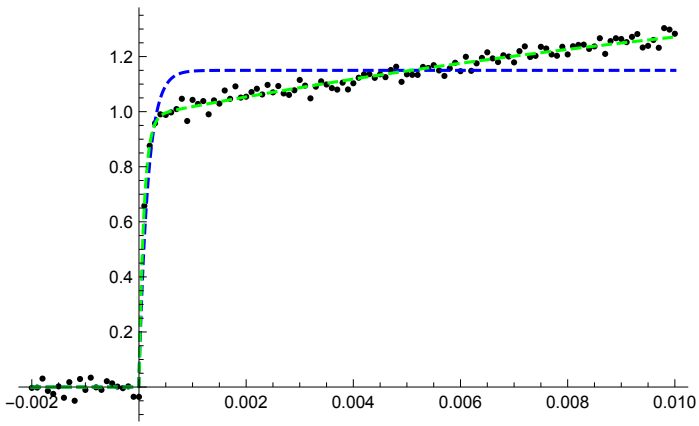

```
Mono: chi2 = 0.645234     d = 0.645234     a = 1.14993     t = 0.000166369
Bi: ratio chi2Mono/chi2Bi = 12.9768     d = -5.34004 × 10^-19     a =
 1.61483     a1 = 0.9805     t1 =0.0000910778     t2 = 0.0163305
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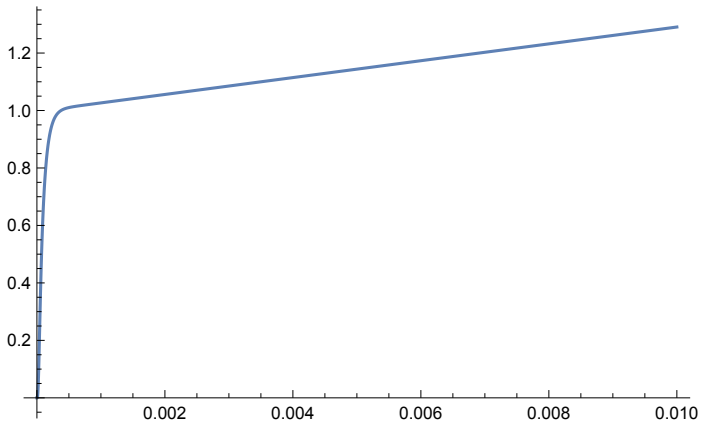

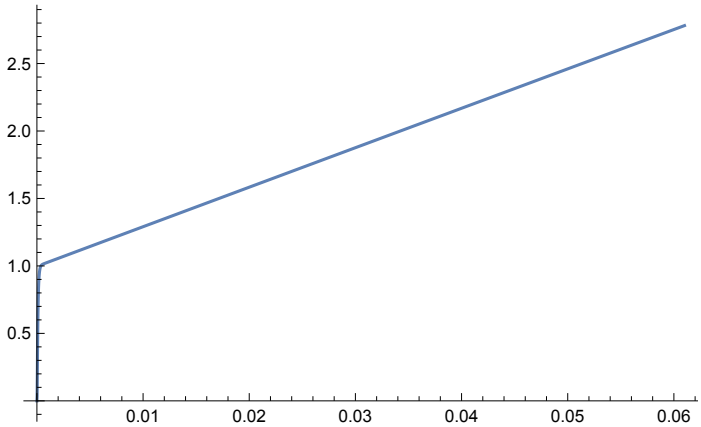


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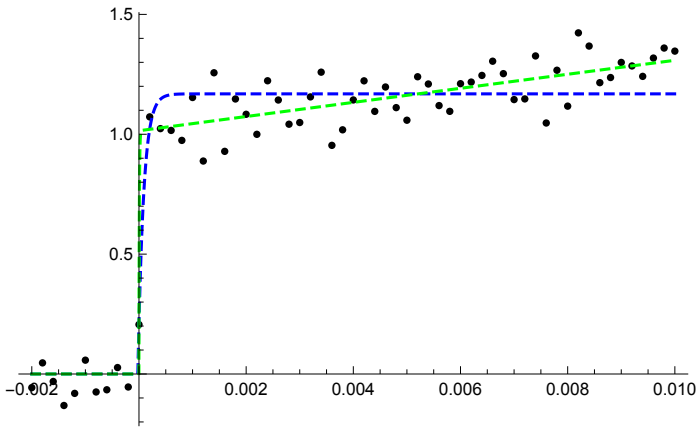

Mono: chi2 = 0.782082 d = 0.782082 a = 1.16848 t = 0.000106736

Bi: ratio chi2Mono/chi2Bi = 1.79346 d = -1.74947×10^{-6} a = 14.3803 a1 = 1.01463 t1 = 7.70044×10^{-6} t2 = 0.449938

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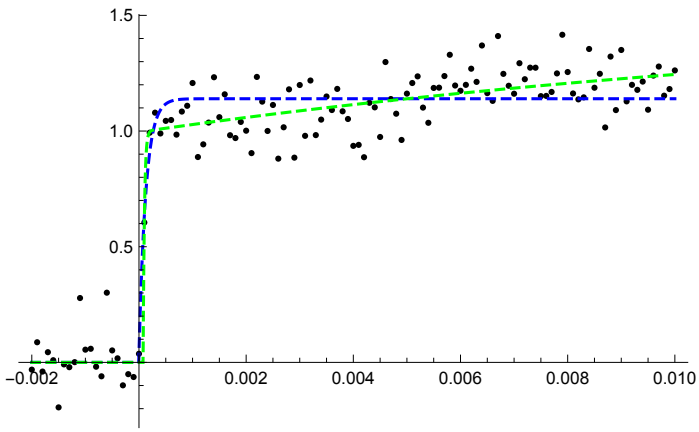


```
Mono: chi2 = 1.7093     d = 1.7093     a = 1.13963     t = 0.000128598
Bi: ratio chi2Mono/chi2Bi = 1.36692     d = 0.0000770463     a =
 1.52915     a1 = 0.998215     t1 =0.0000247195     t2 = 0.0159115
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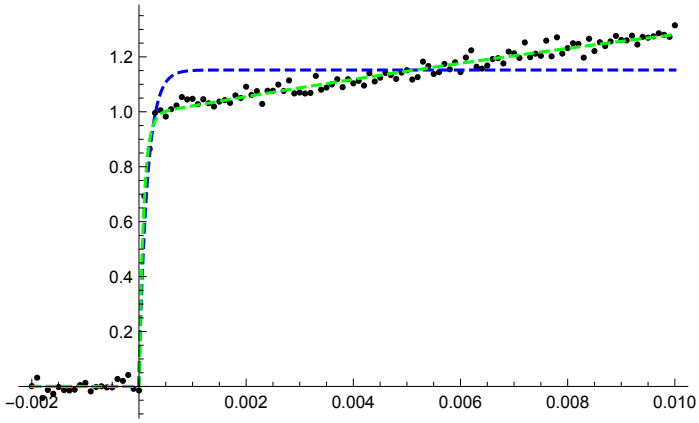

Mono: chi2 = 0.665427 d = 0.665427 a = 1.15213 t = 0.000156131

Bi: ratio chi2Mono/chi2Bi = 13.9458 d = -1.69244×10^{-18} a = 1.92879 a1 = 0.987052 t1 =0.0000856204 t2 = 0.0266901

--- Ca = 48.1689

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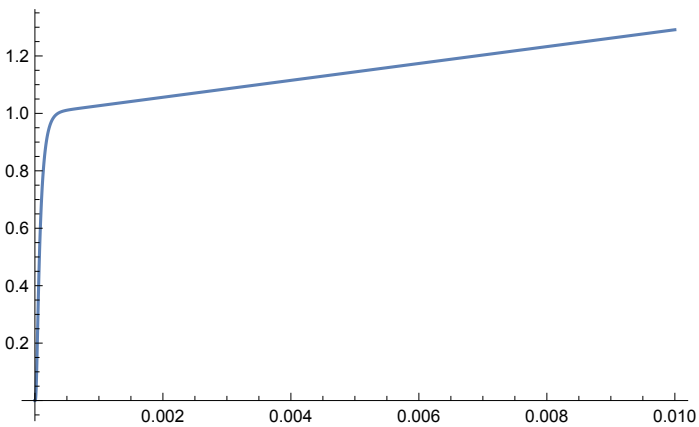

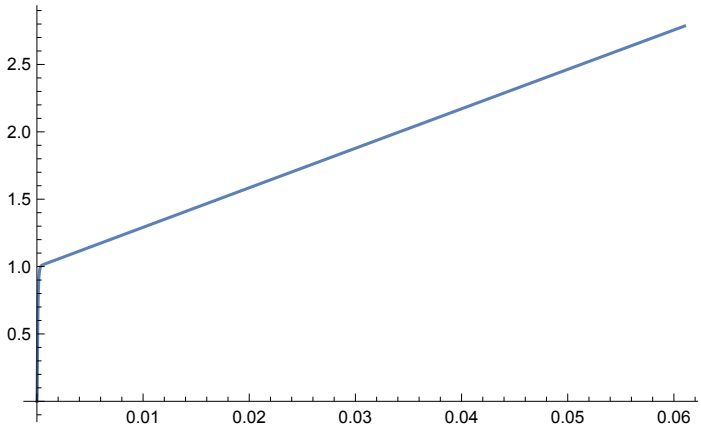

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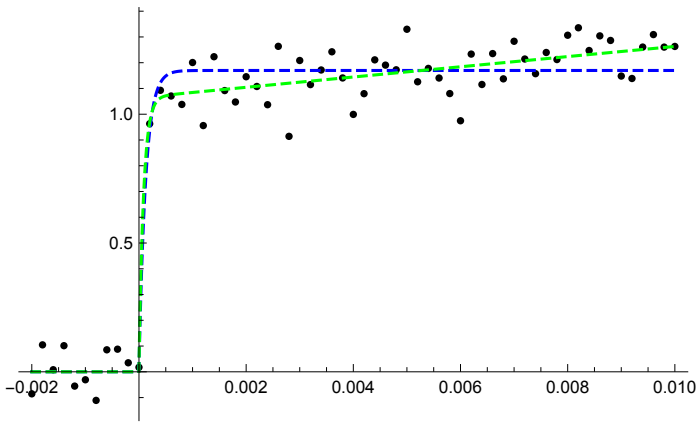

Mono: chi2 = 0.543029 d = 0.543029 a = 1.16984 t = 0.000125828

Bi: ratio chi2Mono/chi2Bi = 1.37688 d = -1.38667×10^{-6}

a = 8.55941 a1 = 1.0643 t1 =0.000085118 t2 = 0.372075

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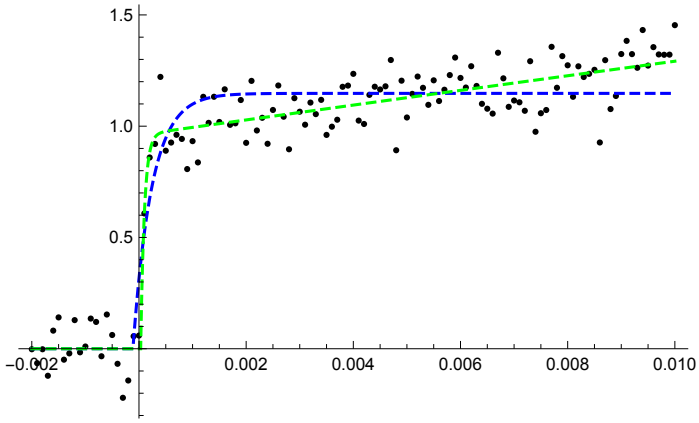


```
Mono: chi2 = 2.04595     d = 2.04595     a = 1.14741     t = 0.000351538
Bi: ratio chi2Mono/chi2Bi = 1.64102     d = 0.0000315331     a =
 9.9979     a1 = 0.96202     t1 =0.0000697612     t2 = 0.268063
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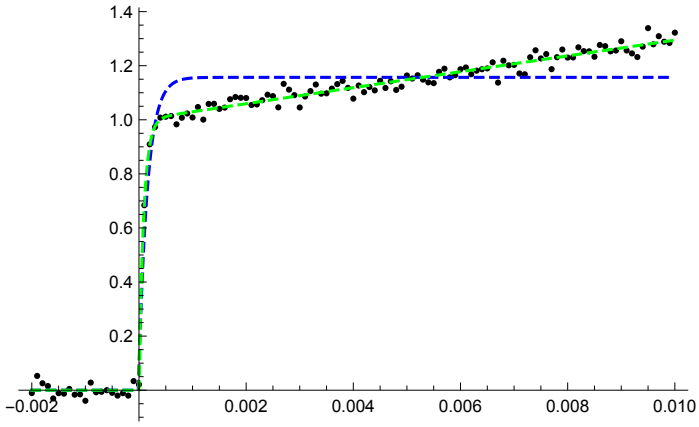
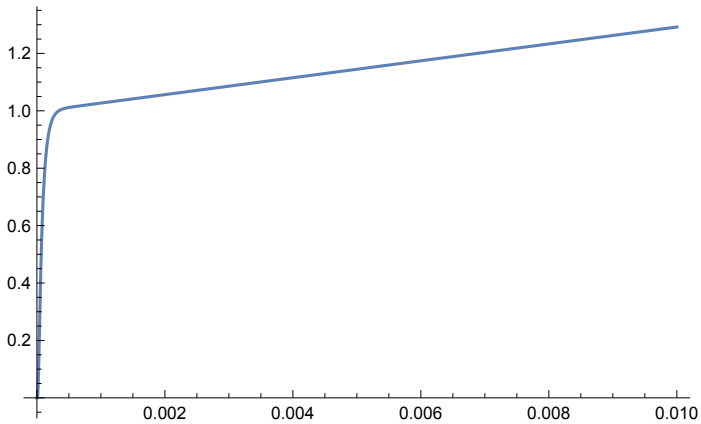


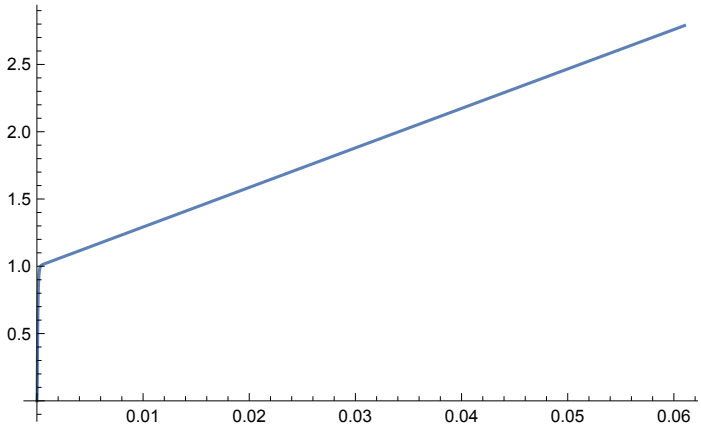
Mono: chi2 = 0.695355 d = 0.695355 a = 1.15691 t = 0.000163921

Bi: ratio chi2Mono/chi2Bi = 12.1539 d = -1.83899×10^{-6} a = 9.59911 a1 = 0.999587 t1 =0.0000883064 t2 = 0.286637

---------- Ca = 50.5171

uM ----------





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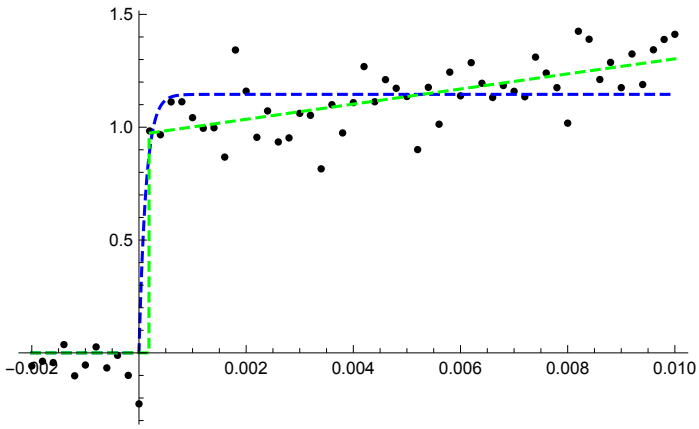

Mono: chi2 = 1.11674 d = 1.11674 a = 1.1456 t = 0.00013054

Bi: ratio chi2Mono/chi2Bi = 1.63651 d = 0.000186152 a = 18.8381 a1 = 0.973688 t1 = 4.5819×10^{-7} t2 = 0.527663

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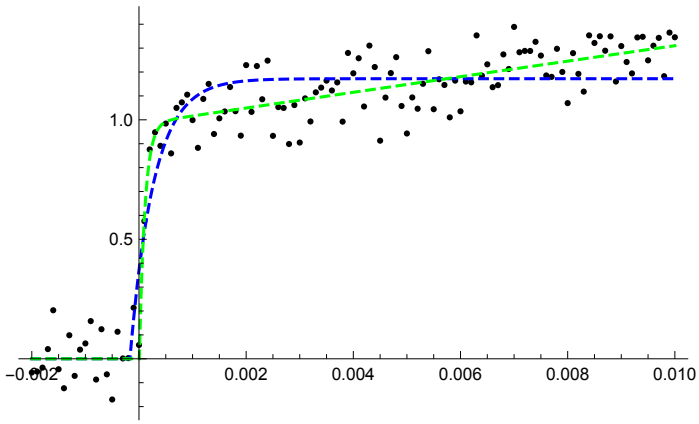

Mono: chi2 = 1.78983 d = 1.78983 a = 1.17198 t = 0.000446311

Bi: ratio chi2Mono/chi2Bi = 1.61698 d = 6.73502×10^{-6} a = 11.1367 a1 = 0.983188 t1 =0.000103572 t2 = 0.305399

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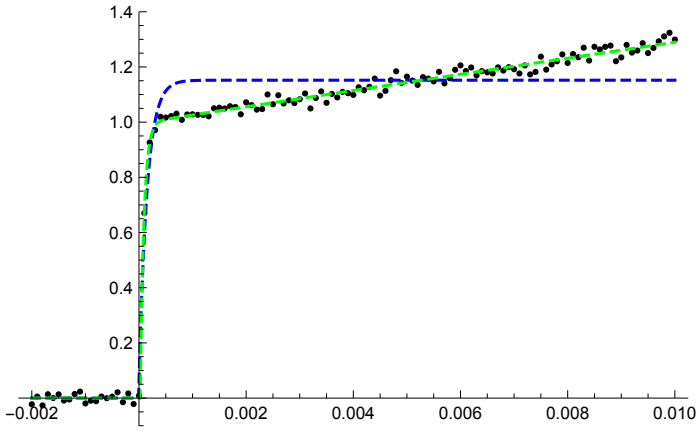


```
Mono: chi2 = 0.670606     d = 0.670606     a = 1.15197     t = 0.00015012
Bi: ratio chi2Mono/chi2Bi = 17.9573     d = 0.0000217597     a =
 8.90477     a1 = 0.99658     t1 =0.0000704545     t2 = 0.264382
-------------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 52.9808
  uM          -------------------------------------------------------
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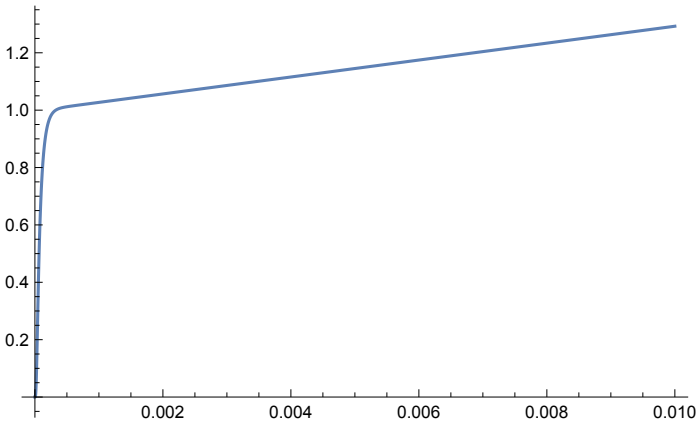

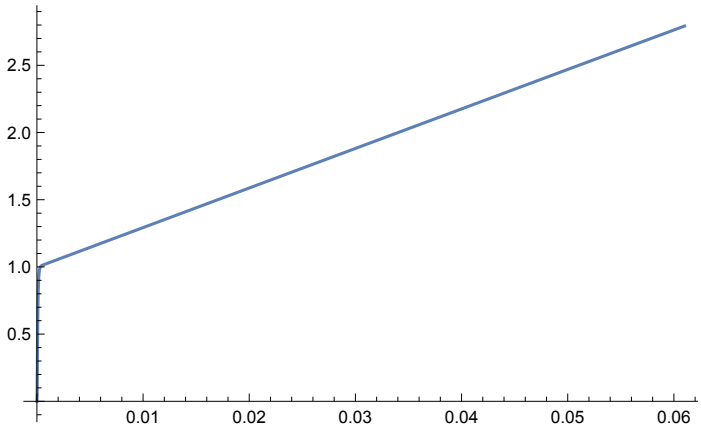

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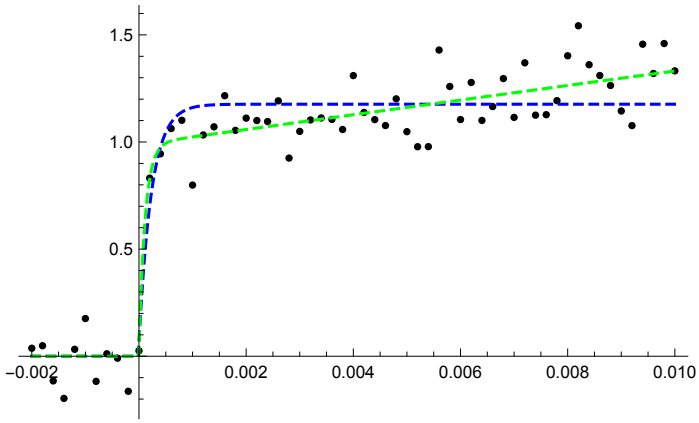

Mono: chi2 = 1.19296 d = 1.19296 a = 1.1764 t = 0.000234803

Bi: ratio chi2Mono/chi2Bi = 1.52963 d = -3.03788×10^{-6} a = 12.4987 a1 = 0.988887 t1 =0.000114819 t2 = 0.331034

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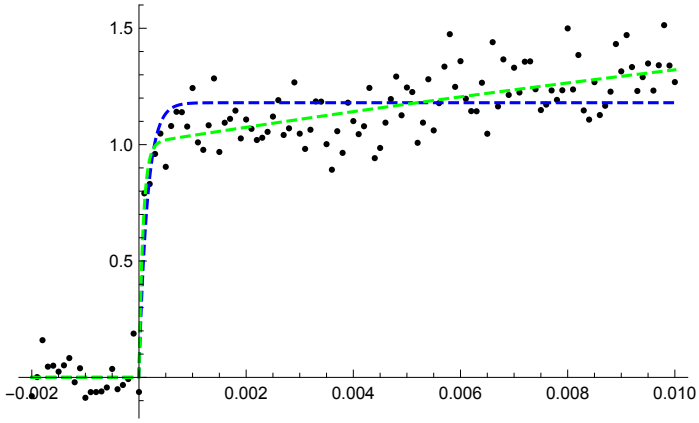

Mono: chi2 = 1.96019 d = 1.96019 a = 1.18012 t = 0.000155897

Bi: ratio chi2Mono/chi2Bi = 1.5912 d = -3.75718×10^{-18} a = 2.25698 a1 = 1.00339 t1 =0.0000765955 t2 = 0.0341719

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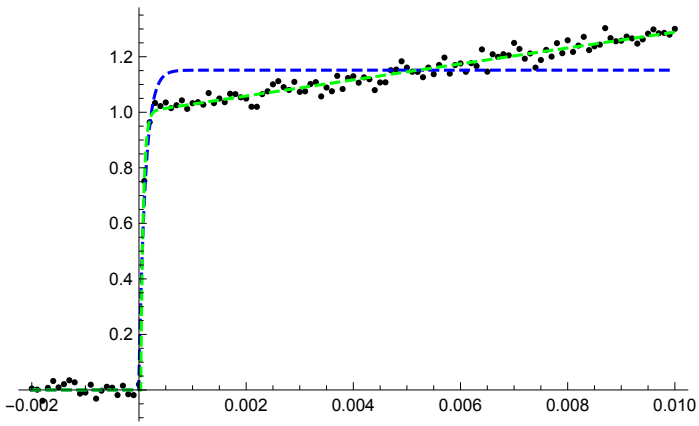

```
Mono: chi2 = 0.68254     d = 0.68254     a = 1.15163     t = 0.000117238
Bi: ratio chi2Mono/chi2Bi = 12.8475     d = 0.0000316289     a =
 8.69339     a1 = 1.00086     t1 =0.0000494584     t2 = 0.261666
-------------------------------------------------------------------------------------
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----------------     Ca = 55.5674
  uM         -------------------------------------------------------
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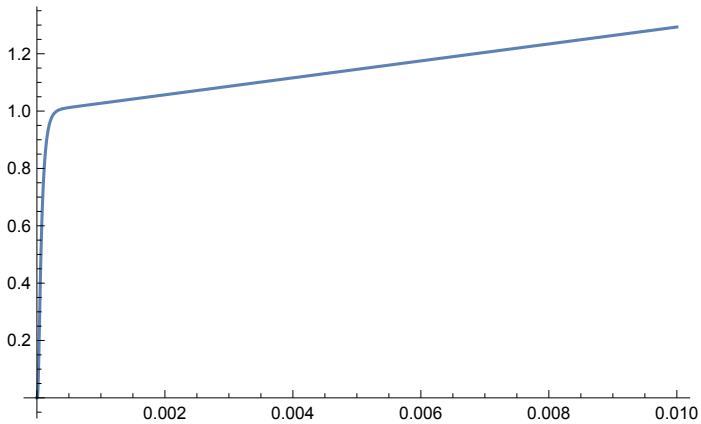

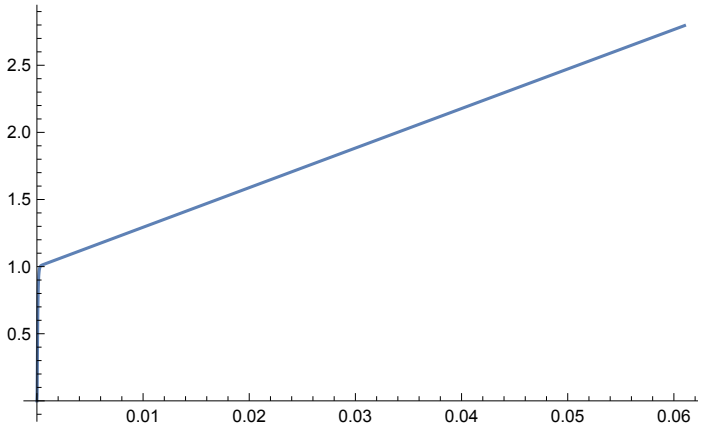


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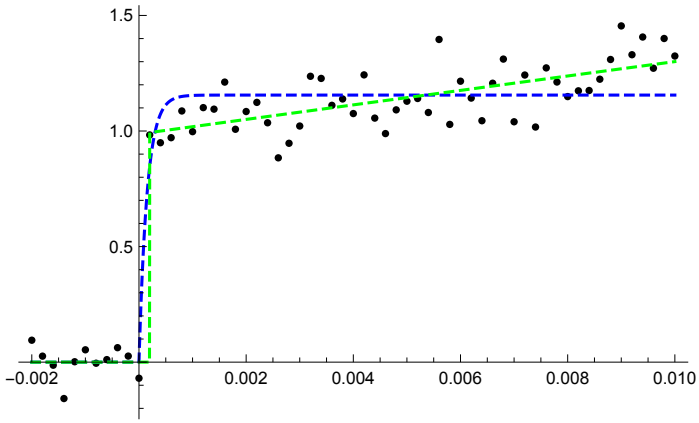

Mono: chi2 = 0.887771 d = 0.887771 a = 1.15546 t = 0.000151897

Bi: ratio chi2Mono/chi2Bi = 1.70719 d = 0.000197905 a = 17.3681 a1 = 0.993324 t1 = 4.62217×10^{-7} t2 = 0.518035

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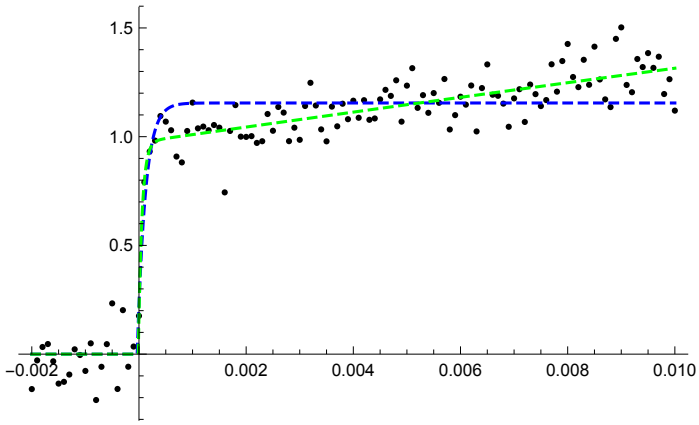


```
Mono: chi2 = 1.90606     d = 1.90606     a = 1.15492     t = 0.000150334
Bi: ratio chi2Mono/chi2Bi = 1.84804     d = -0.0000134151     a =
 7.26356     a1 = 0.974192     t1 =0.0000679385     t2 = 0.179898
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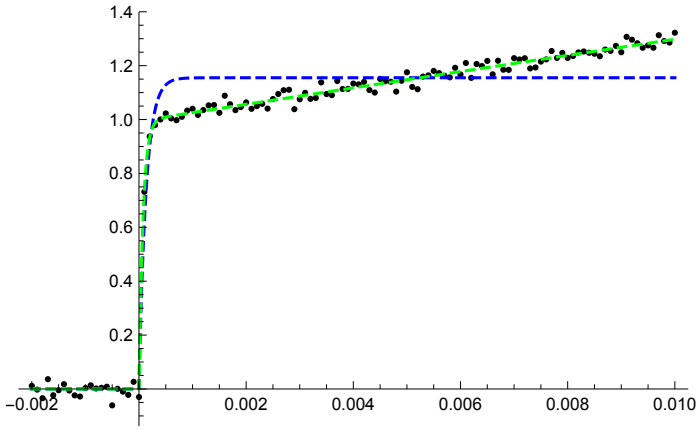
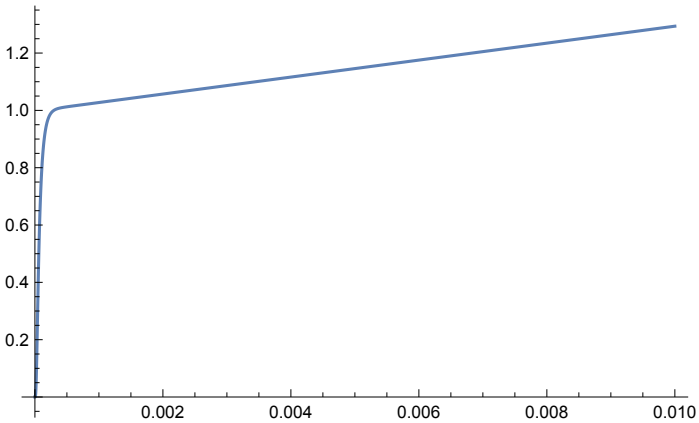


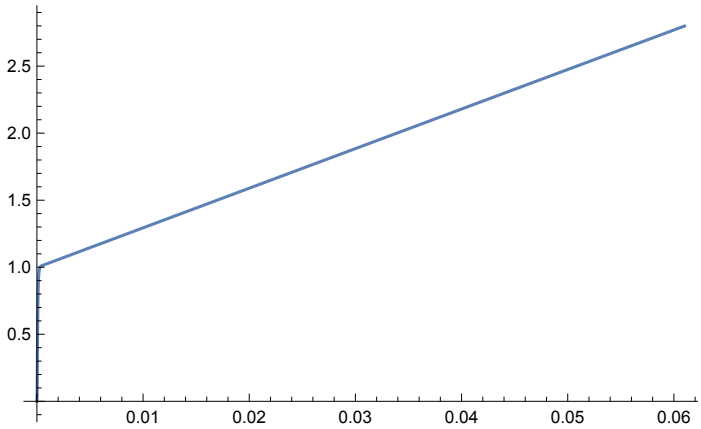
Mono: chi2 = 0.734687 d = 0.734687 a = 1.15507 t = 0.000133134

Bi: ratio chi2Mono/chi2Bi = 16.1455 d = 3.05385×10^{-6} a = 8.83675 a1 = 0.994893 t1 =0.000073412 t2 = 0.253723

---- Ca = 58.281

uM ----------





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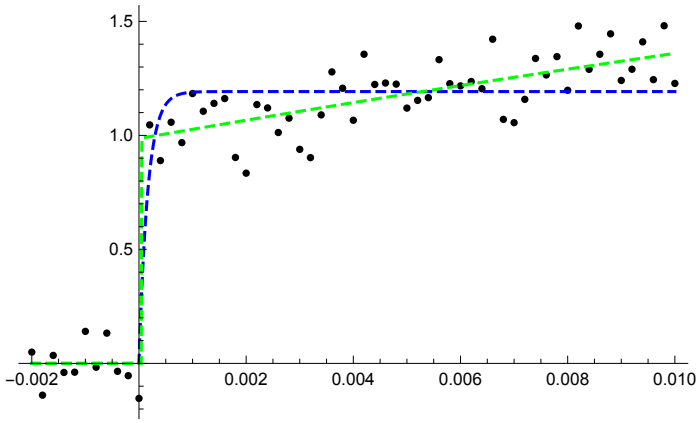

Mono: chi2 = 1.21774 d = 1.21774 a = 1.19222 t = 0.000164442

Bi: ratio chi2Mono/chi2Bi = 1.79841 d = 0.0000453258 a = 3.21097 a1 = 0.98821 t1 = 2.31929×10^{-6} t2 = 0.0544173

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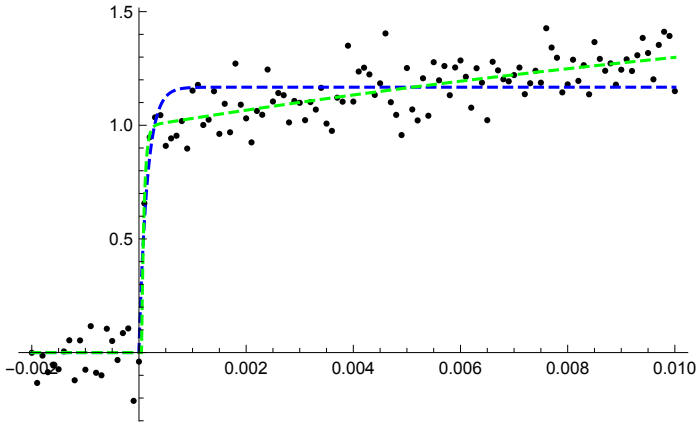


```
Mono: chi2 = 1.63736     d = 1.63736     a = 1.16758     t = 0.000151383
Bi: ratio chi2Mono/chi2Bi = 1.69179     d = 0.0000481238     a =
 1.77866     a1 = 0.994371     t1 =0.0000483719     t2 = 0.020266
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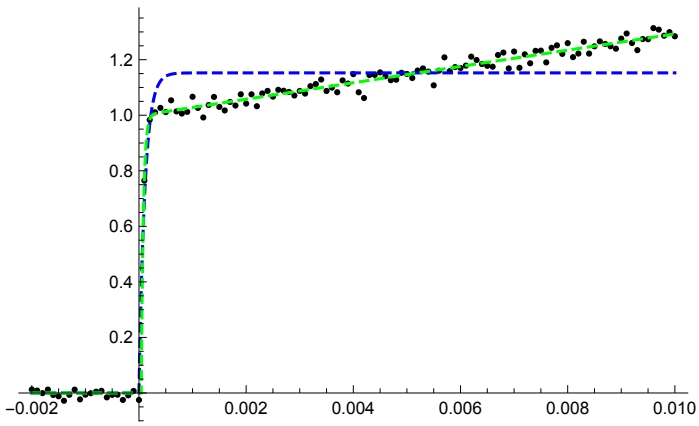

```
Mono: chi2 = 0.704421     d = 0.704421     a = 1.1525     t = 0.000109762
Bi: ratio chi2Mono/chi2Bi = 15.215     d = 0.0000418455     a =
 12.381     a1 = 0.999485     t1 =0.0000403623     t2 = 0.381662
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 61.1317
  uM         -------------------------------------------------------
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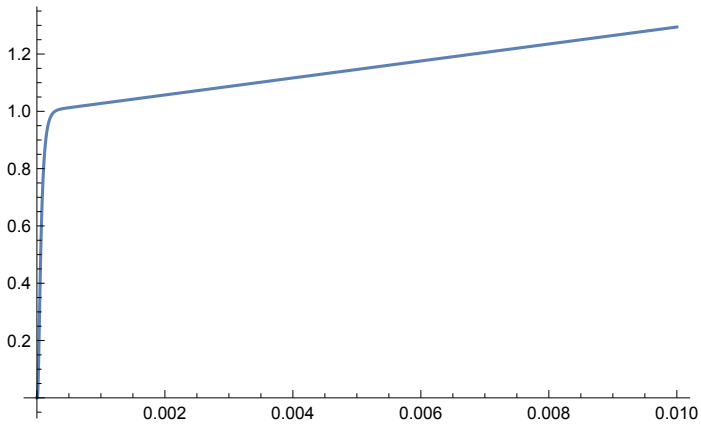

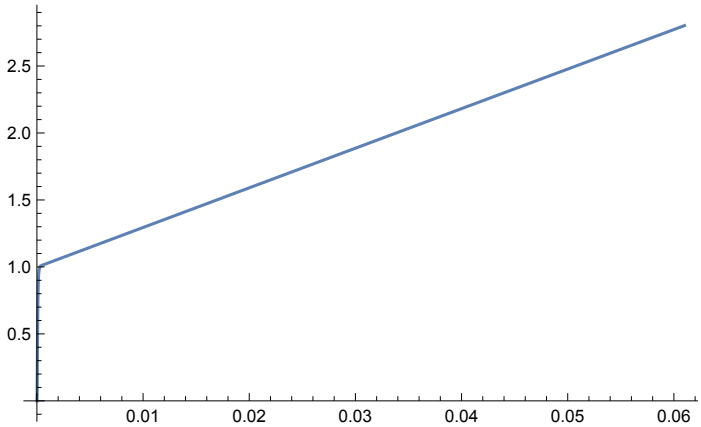


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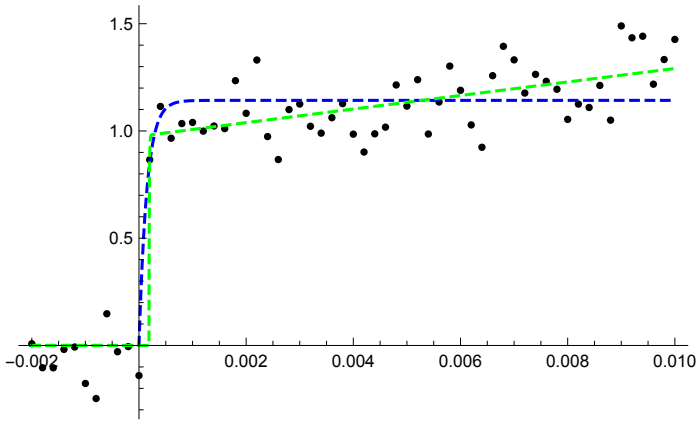

Mono: chi2 = 1.28644 d = 1.28644 a = 1.1426 t = 0.000147159

Bi: ratio chi2Mono/chi2Bi = 1.42783 d = 0.000185627 a = 19.8817 a1 = 0.981086 t1 = 6.73508×10^{-6} t2 = 0.593152

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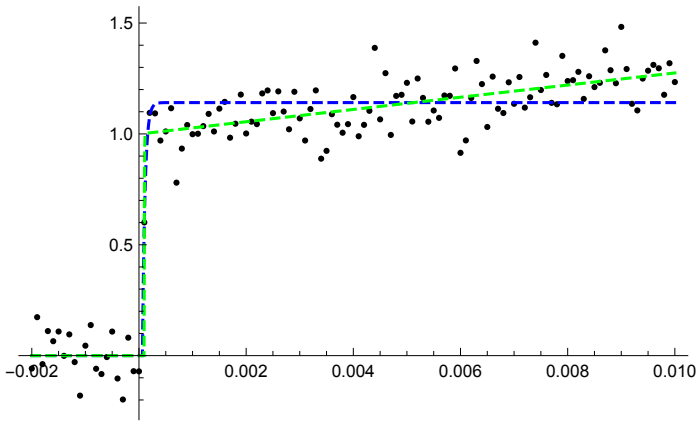

Mono: chi2 = 1.74754 d = 1.74754 a = 1.14122 t = 0.0000469815

Bi: ratio chi2Mono/chi2Bi = 1.5384 d = 0.0000962915 a = 12.1832 a1 = 1.00186 t1 = 4.05292×10^{-6} t2 = 0.400589

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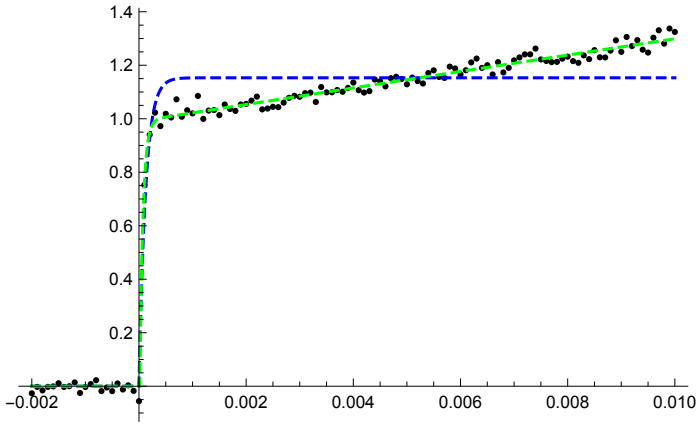


```
Mono: chi2 = 0.769174     d = 0.769174     a = 1.15306     t = 0.000122857
Bi: ratio chi2Mono/chi2Bi = 14.9299     d = 0.0000136317     a =
 10.1116     a1 = 0.991194     t1 =0.000061357     t2 = 0.291068
--------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 64.1214
  uM          -------------------------------------------------------
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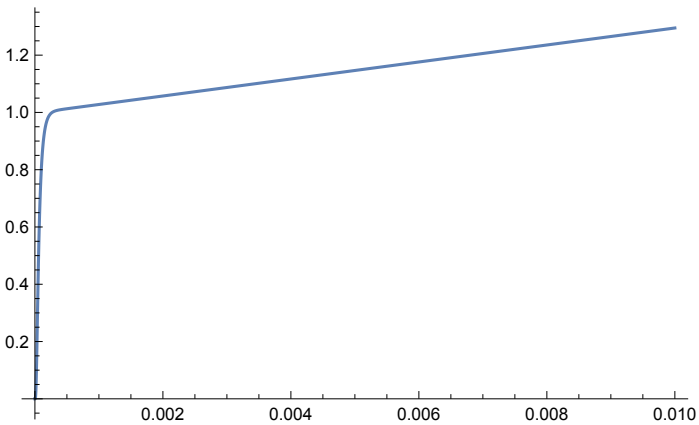

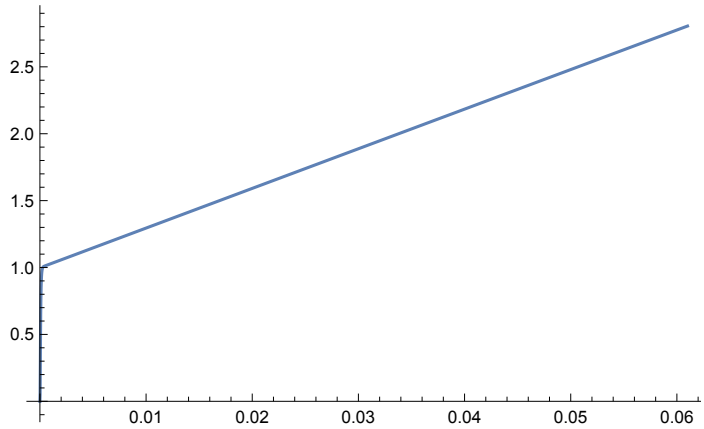

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FittedModel: The sum of squared errors is not a non−negative number. The model may suffer from significant numerical error or may not be appropriate for the data.

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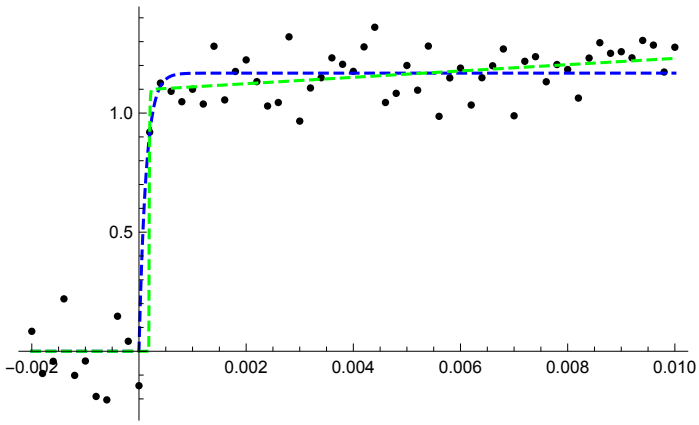

Mono: chi2 = 0.668058 d = 0.668058 a = 1.16772 t = 0.000131436

Bi: ratio chi2Mono/chi2Bi = 1.10897 d = 0.000184129 a = 6.05428 a1 = 1.09897 t1 = 8.75476×10^{-6} t2 = 0.367205

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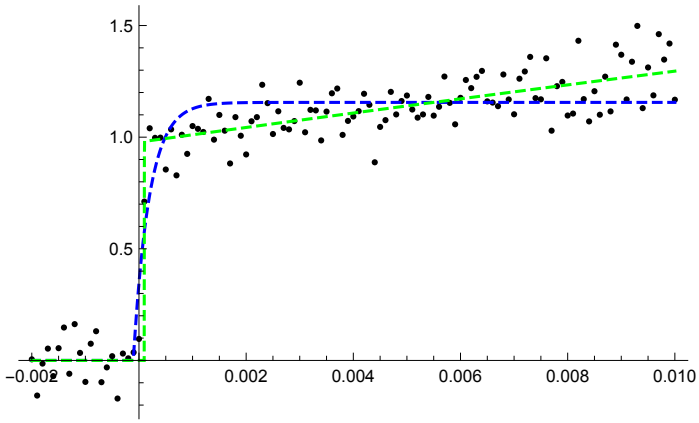

Mono: chi2 = 1.82161 d = 1.82161 a = 1.15572 t = 0.00029836

Bi: ratio chi2Mono/chi2Bi = 1.74055 d = 0.0000990134 a = 4.9618 a1 = 0.980997 t1 = 7.63563×10^{-7} t2 = 0.120248

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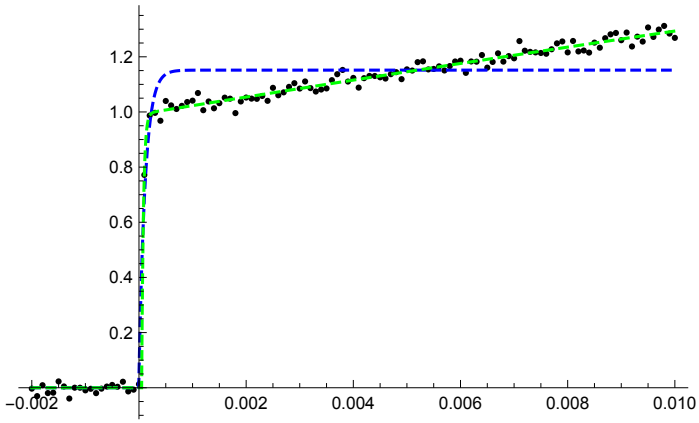
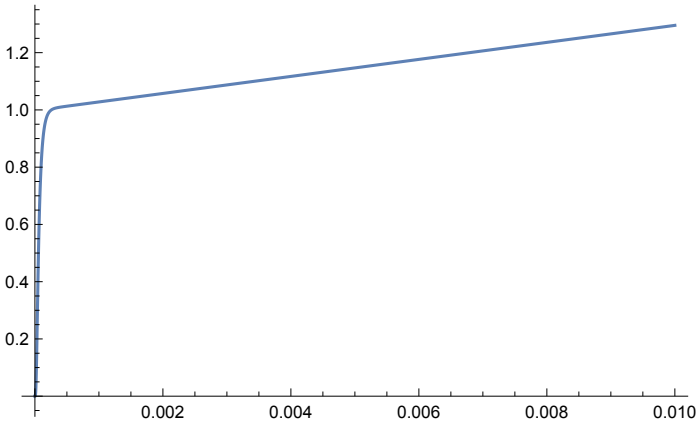


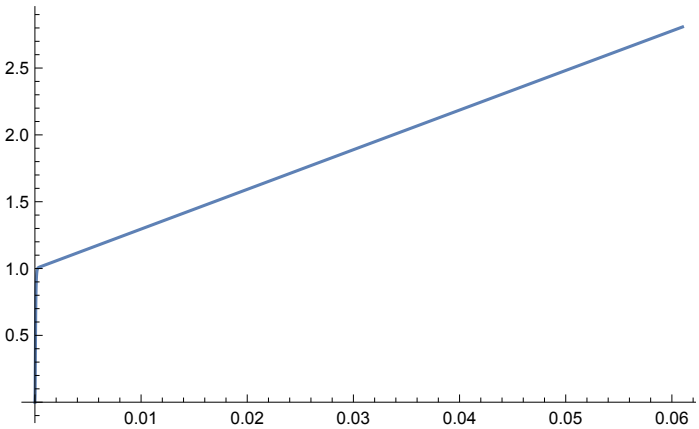
Mono: chi2 = 0.727149 d = 0.727149 a = 1.15167 t = 0.000116534

Bi: ratio chi2Mono/chi2Bi = 17.9783 d = 0.000049812 a = 4.5556 a1 = 0.993091 t1 =0.0000335897 t2 = 0.112996

--- Ca = 67.2653

uM ---





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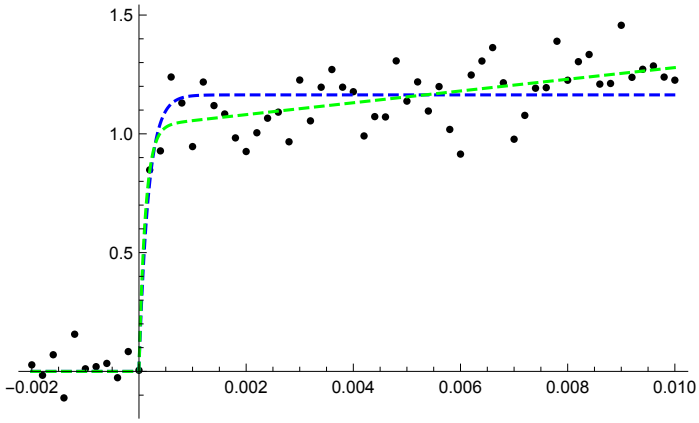

Mono: chi2 = 0.846346 d = 0.846346 a = 1.16397 t = 0.000176124

Bi: ratio chi2Mono/chi2Bi = 1.36059 d = -5.203×10^{-7} a = 9.67293 a1 = 1.03062 t1 =0.00011981 t2 = 0.343097

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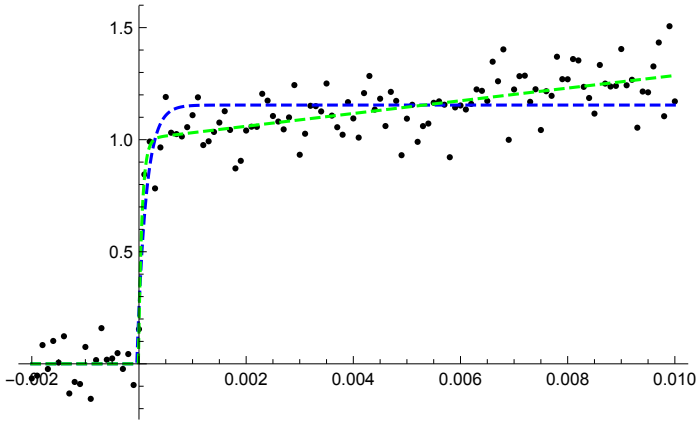


```
Mono: chi2 = 1.69034     d = 1.69034     a = 1.15451     t = 0.00016779
Bi: ratio chi2Mono/chi2Bi = 1.5329     d = -0.0000111199     a =
 11.6412     a1 = 1.0022     t1 =0.0000649881     t2 = 0.369723
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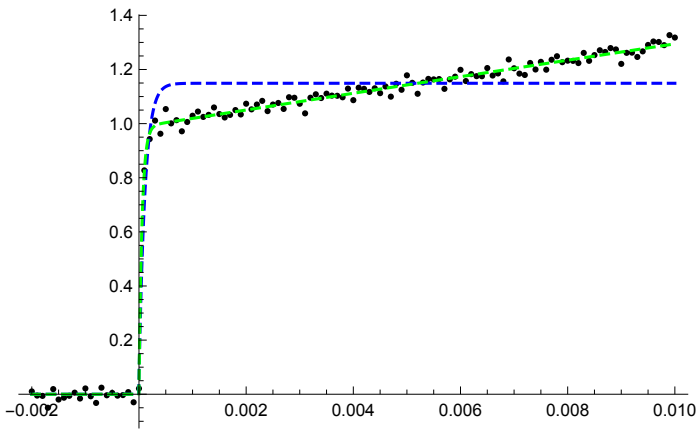
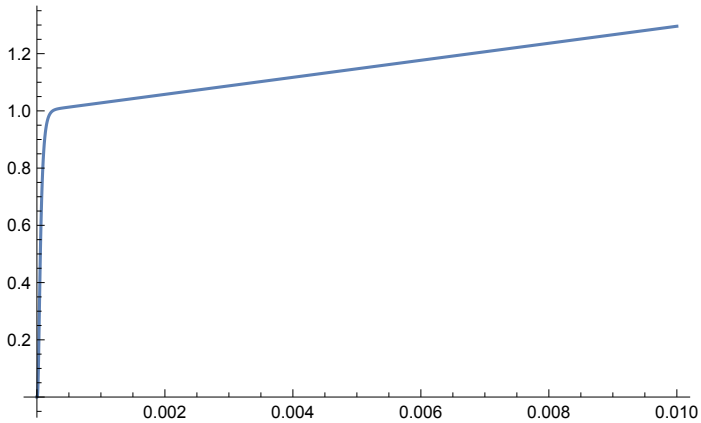
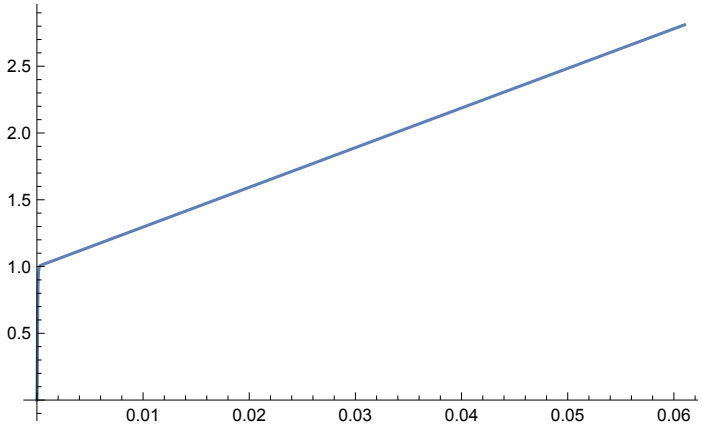


Mono: chi2 = 0.764375 d = 0.764375 a = 1.14909 t = 0.00011162

Bi: ratio chi2Mono/chi2Bi = 17.4239 d = -1.27483×10^{-6} a = 9.03724 a1 = 0.988031 t1 =0.0000576281 t2 = 0.257487

---------- Ca = 70.5652
uM ----------





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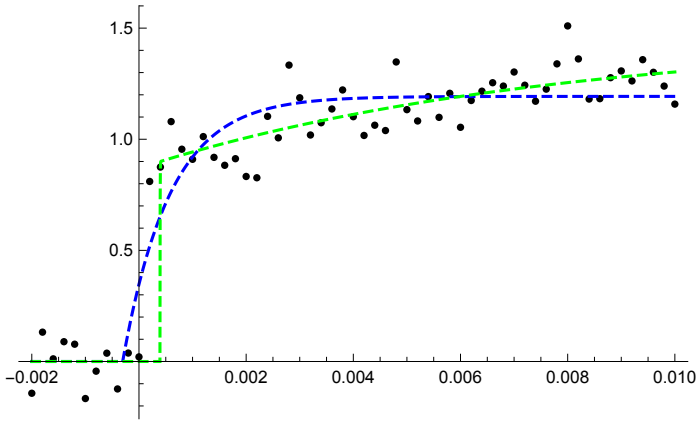

Mono: chi2 = 1.16062 d = 1.16062 a = 1.19283 t = 0.000883371

Bi: ratio chi2Mono/chi2Bi = 0.938751 d = 0.000391672 a = 1.46112 a1 = 0.899519 t1 = 2.33223×10^{-6} t2 = 0.00759529

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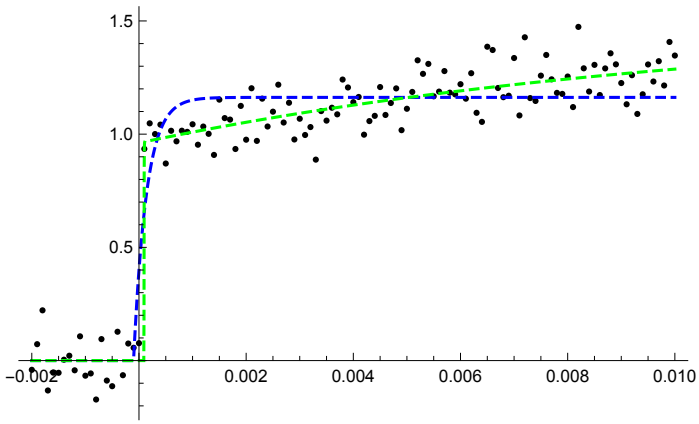

Mono: chi2 = 1.87976 d = 1.87976 a = 1.16236 t = 0.000240637

Bi: ratio chi2Mono/chi2Bi = 1.94395 d = 0.0000932521 a = 1.50211 a1 = 0.96593 t1 = 1.96988×10^{-6} t2 = 0.0108377

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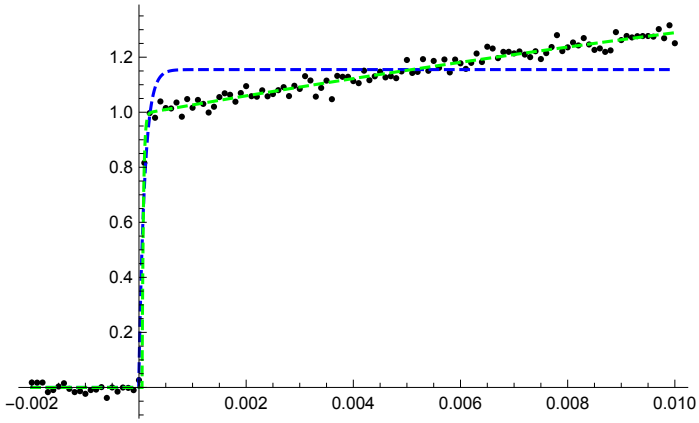


```
Mono: chi2 = 0.70972     d = 0.70972     a = 1.15498     t = 0.000106545
Bi: ratio chi2Mono/chi2Bi = 14.88     d = 0.0000572817     a =
 2.10559     a1 = 0.994659     t1 =0.0000250004     t2 = 0.0322896
-------------------------------------------------------------------------------------
  -------------------------
----------------     Ca = 74.0312
  uM         -------------------------------------------------------
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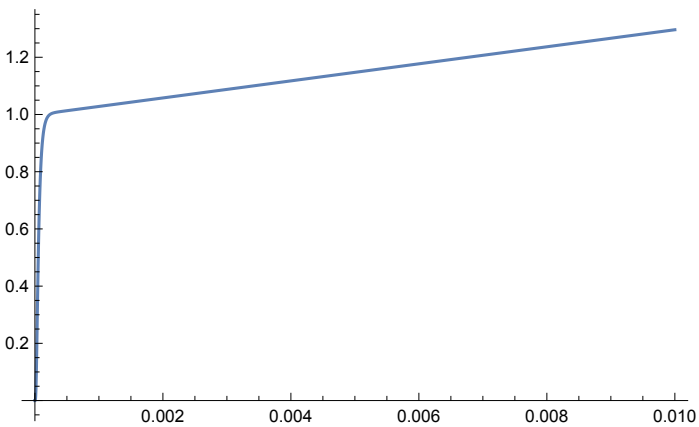

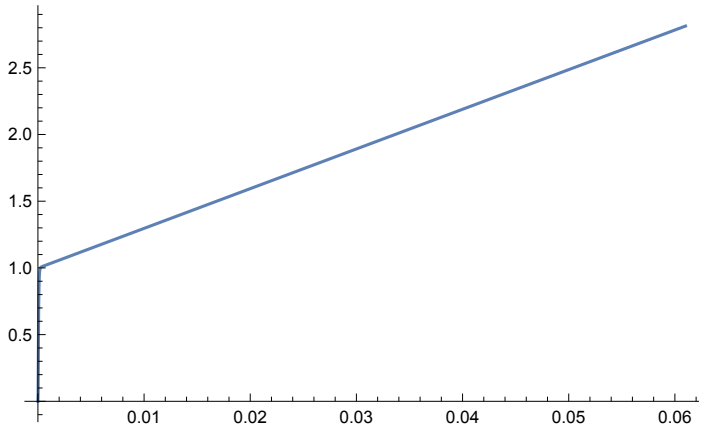

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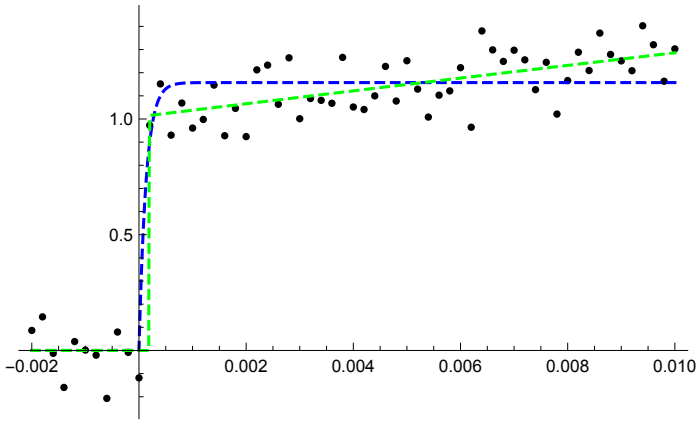

Mono: chi2 = 0.899157 d = 0.899157 a = 1.15728 t = 0.000133428

Bi: ratio chi2Mono/chi2Bi = 1.50207 d = 0.000182908 a = 8.00164 a1 = 1.01489 t1 = 5.38446×10^{-6} t2 = 0.248163

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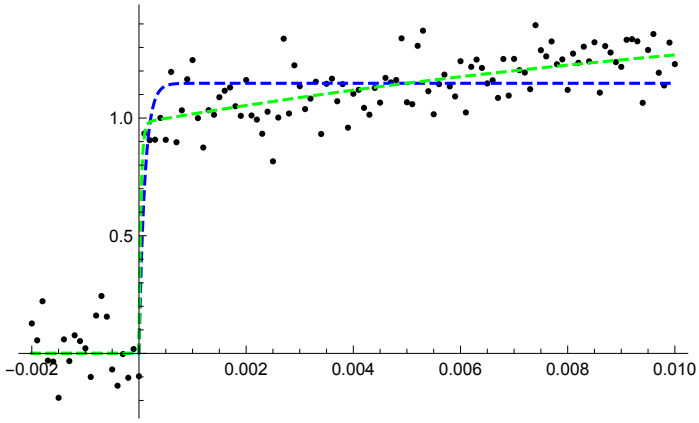

Mono: chi2 = 1.84965 d = 1.84965 a = 1.14779 t = 0.000107468

Bi: ratio chi2Mono/chi2Bi = 1.56076 d = -1.00338×10^{-18} a = 1.56157 a1 = 0.978716 t1 =0.0000359774 t2 = 0.0145701

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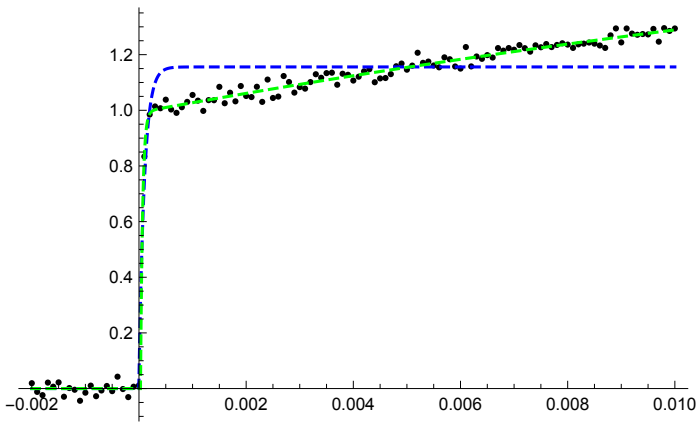


```
Mono: chi2 = 0.713533     d = 0.713533     a = 1.15587     t = 0.000101223
Bi: ratio chi2Mono/chi2Bi = 15.1713     d = 0.0000283302     a =
 1.96001     a1 = 0.993627     t1 =0.0000395516     t2 = 0.0273492
```

Plots

In[1419]:=
```
rrp = 10;
```

In[1420]:=
```
caFact = 1*^6;
```

In[1421]:=
```
colorA = Green;
colorB = Red;
colorC = Blue;
```

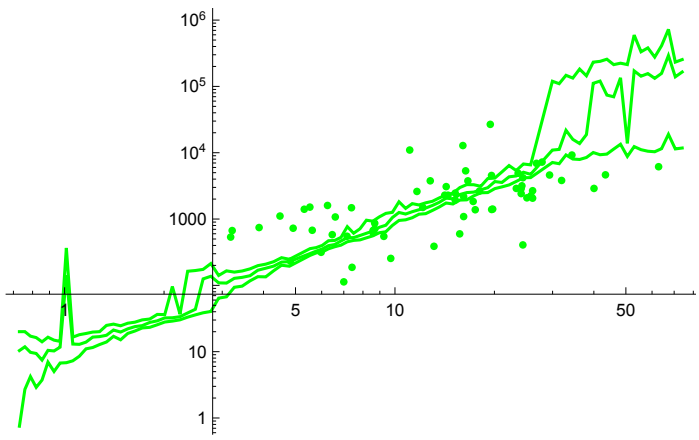
release rate 1/tau1 (merge of mono 1/tau and bi 1/tau1)

In[1424]:=
```
simParam = 15;
```

C5

In[1425]:=
```
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"];
 ];
```

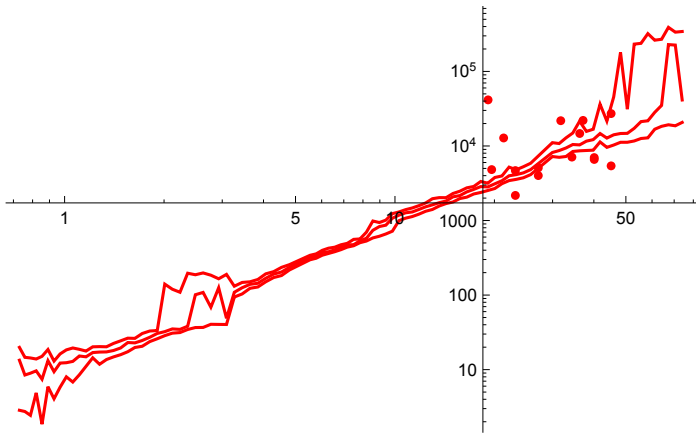
Out[1429]=



C10

In[1431]:=
```
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"];
 ];
```

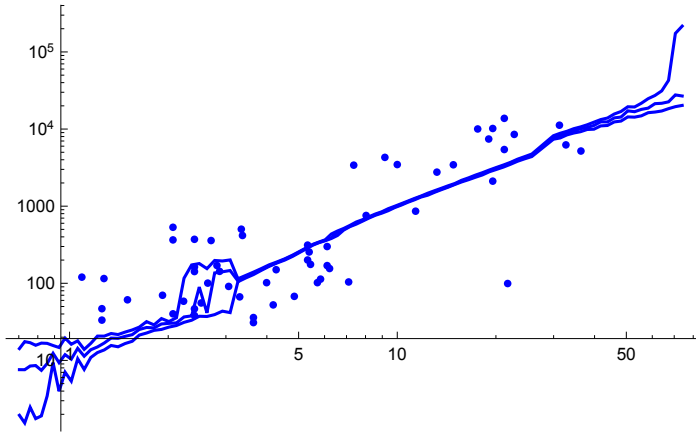
Out[1435]=



D

In[1437]:=
```
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"];
 ];
```

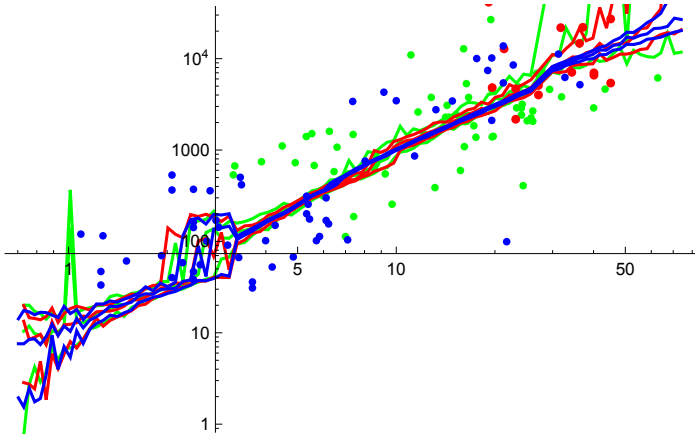
Out[1441]=



C5 and C10 and D

In[1443]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {All, {0, 10}}]
```

Out[1443]=



In[1444]:=
```
Show[gr1a, gr1b, gr1c, PlotRange → {All, {2, 10}}];
```

delay (mono and bi merged)

In[1445]:=
```
simParam = 12;
```

In[1446]:=
```
Transpose[{caFact simCaList, simParamMedianC5[[simParam, All]]}] // TableForm
```

Out[1446]//TableForm=

0.703073	
0.729825	9.58594×10^{-16}
0.758204	1.96486×10^{-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	9.7844×10^{-16}
2.92648	0.00025497

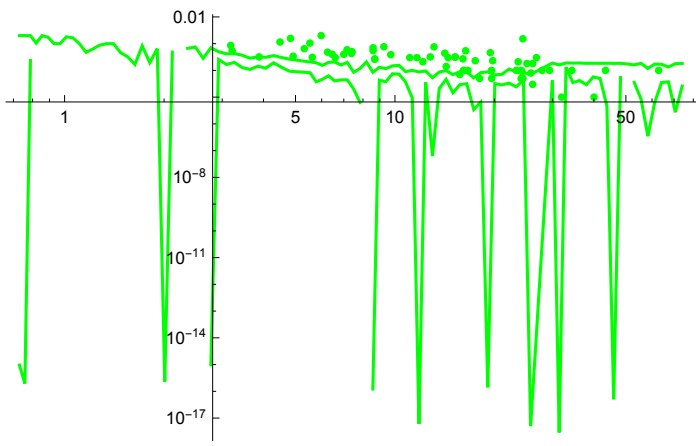
3.0905	0.000165417
3.26357	0.0002
3.44741	0.000127751
3.64088	0.000109048
3.84593	0.000143833
4.06272	0.000120992
4.29254	0.000193687
4.53549	0.00013022
4.79194	0.0000933557
5.53376	0.0000819211
5.7741	0.0000375815
6.02652	0.0000462668
6.29189	0.0000624981
6.57096	0.0000402406
6.86435	0.0000443236
7.17282	0.0000444655
7.4968	0.0000202787
7.83735	6.36918×10^{-6}
8.19526	-3.00332×10^{-18}
8.57176	1.2209×10^{-16}
8.96782	0.0000430543
9.38444	0.0000376905
9.82288	0.000074798
10.2842	0.0000728441
10.77	0.0000367307
11.2815	9.30363×10^{-6}
11.8202	6.12308×10^{-18}
12.3876	0.0000355415
12.9855	6.26326×10^{-8}
13.6155	0.0000211342
14.2795	0.0000462073
14.9795	0.000014492
15.7174	0.0000294381
16.4957	0.000031761
17.3163	3.44393×10^{-6}
18.1821	6.53767×10^{-6}
19.0955	1.40954×10^{-16}
20.0596	0.0000319507
21.0761	0.0000286095
22.1498	0.0000334873
23.2819	0.0000243125
24.4782	0.0000431647
25.7412	4.99942×10^{-18}
29.9583	0.000042017
31.4124	2.89969×10^{-18}
32.938	0.000133106
34.5385	0.0000350066
36.2174	0.0000416025
37.9787	0.0000291798
39.8264	0.0000571378
41.7651	0.000050111
43.7978	4.72953×10^{-6}
45.9306	5.05216×10^{-17}
48.1689	0.000054387
50.5171	-1.25589×10^{-18}
52.9808	0.0000356335
55.5674	8.54583×10^{-6}
58.281	3.4642×10^{-7}
61.1317	6.35434×10^{-6}
64.1214	0.000035386
67.2653	0.0000374144

70.5652	2.73002×10^{-6}
74.0312	0.0000259652

C5

In[1447]:=
```
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"];
 ];
```

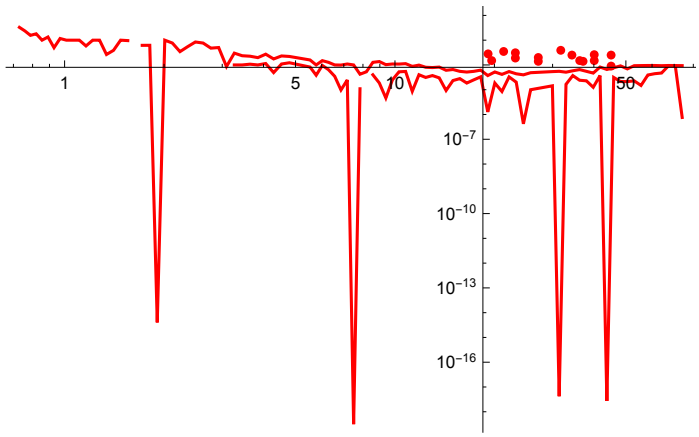
Out[1451]=



C10

In[1453]:=
```
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"];
 ];
```

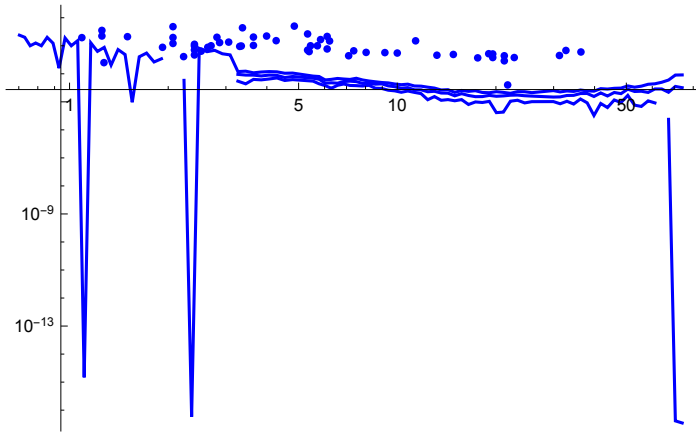
Out[1457]=



D

In[1459]:=
```
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"];
 ];
```

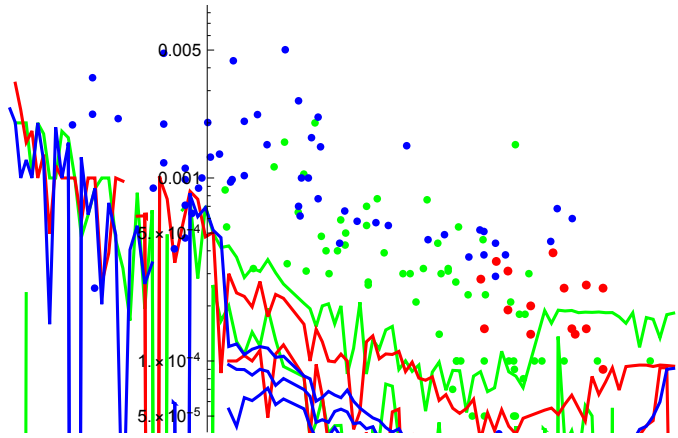
Out[1463]=



C5 and C10 and D

In[1465]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {-10, -5}]
```

Out[1465]=



In[1466]:=
```
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

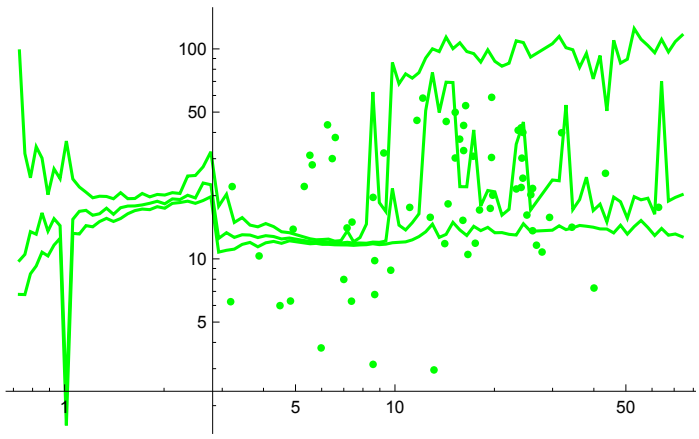
amp (merge of mono amp and bi amp)

In[1467]:=
```
simParam = 13;
```

C5

In[1468]:=
```
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 ]
```

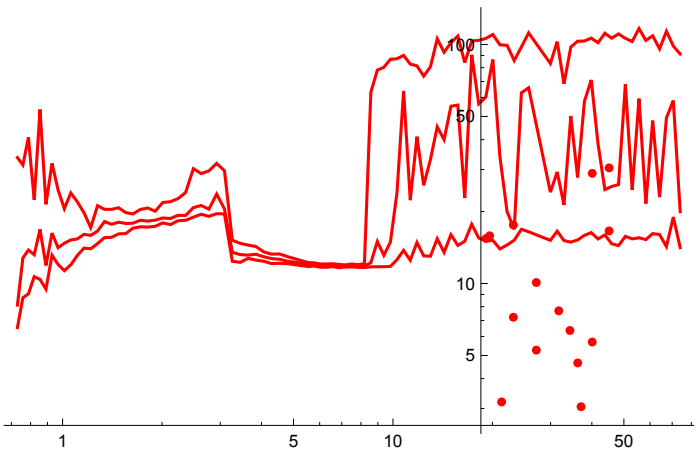
Out[1472]=



C10

In[1473]:=
```
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 ]
```

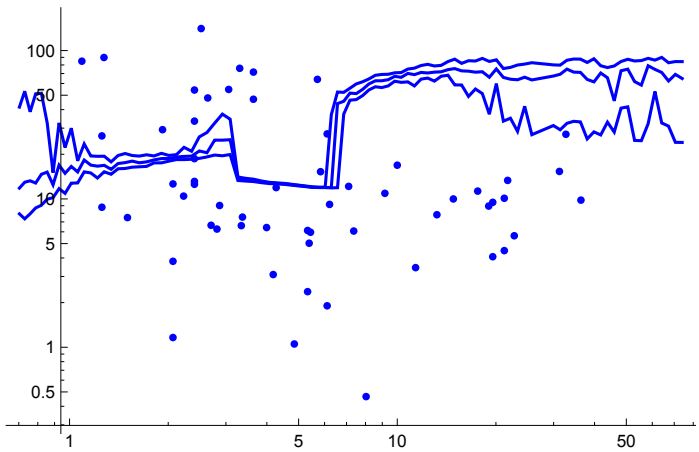
Out[1477]=



D

In[1478]:=
```
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 ]
```

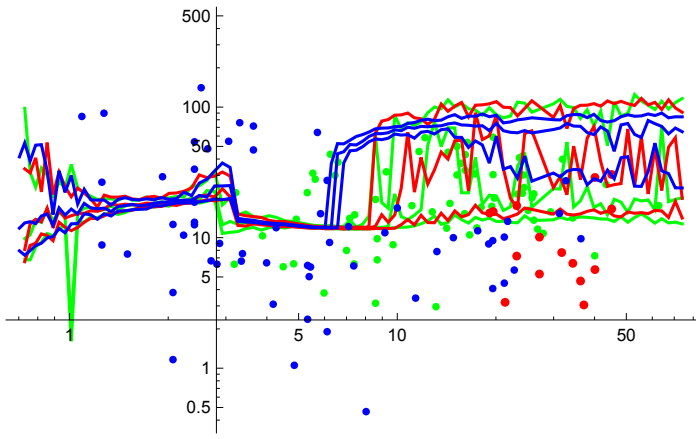
Out[1482]=



C5 and C10 and D

In[1483]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {-1, 6} ]
```

Out[1483]=



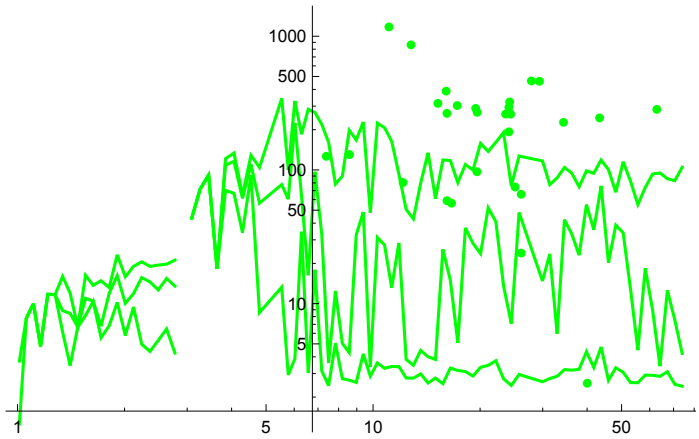
release rate 1/tau2 of bi fits (if bi is justified)

In[1484]:=
```
simParam = 16;
```

C5

In[1485]:=
```
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"];
 ];
```

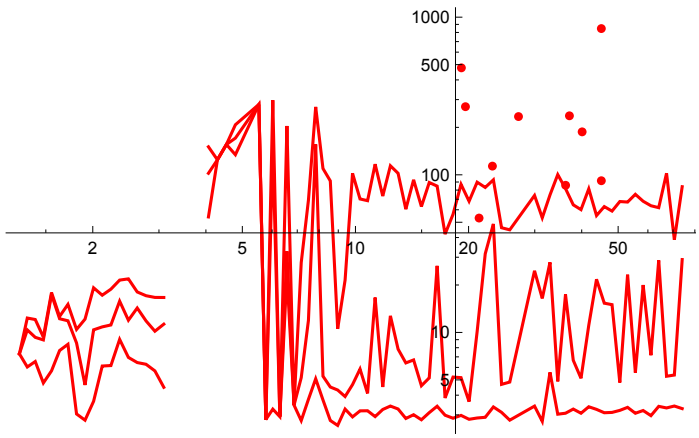
Out[1489]=



C10

In[1491]:=
```
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"];
 ];
```

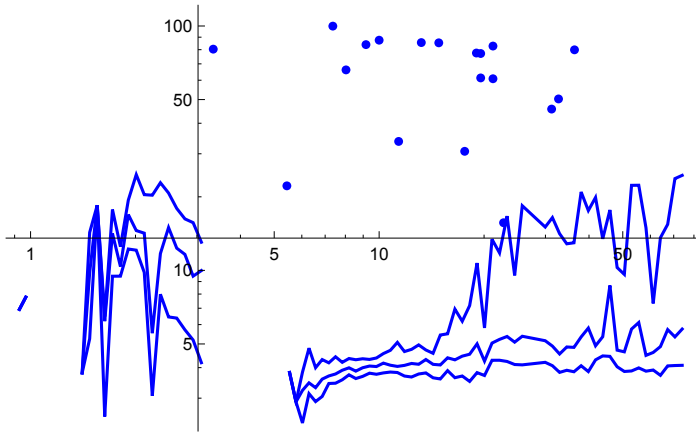
Out[1495]=



D

In[1497]:=
```
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"];
 ];
```

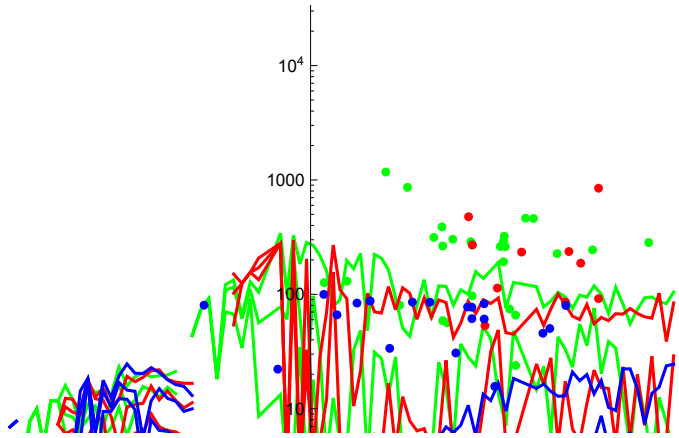
Out[1501]=



C5 and C10 and D

In[1503]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {All, {2, 10}}]
```

Out[1503]=



In[1504]:=
```
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

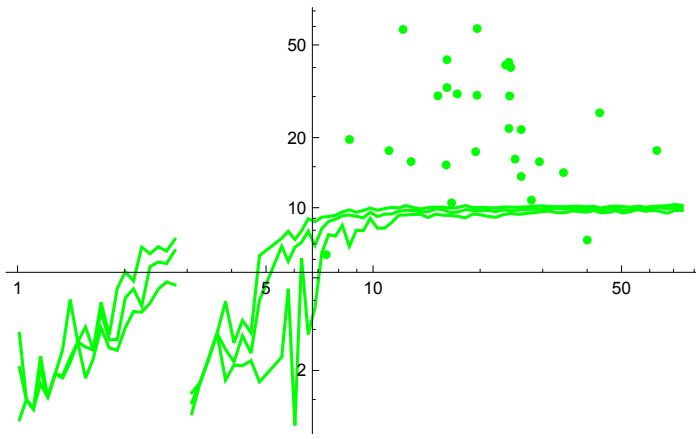
amp1 of bi fits (if bi is justified)

In[1505]:=
```
simParam = 14;
```

C5

In[1506]:=
```
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 ]
```

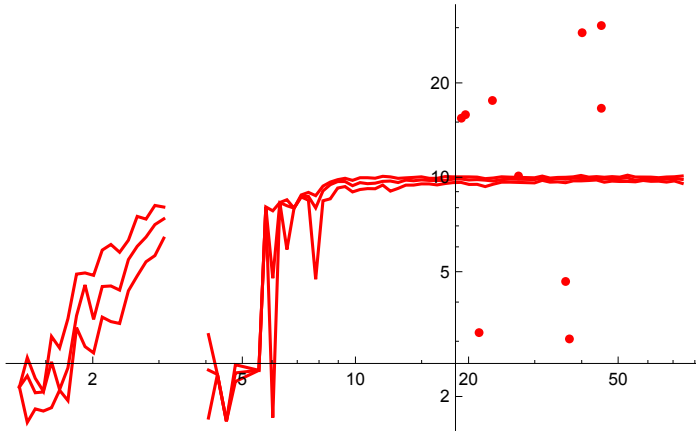
Out[1510]=



C10

In[1511]:=
```
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 ]
```

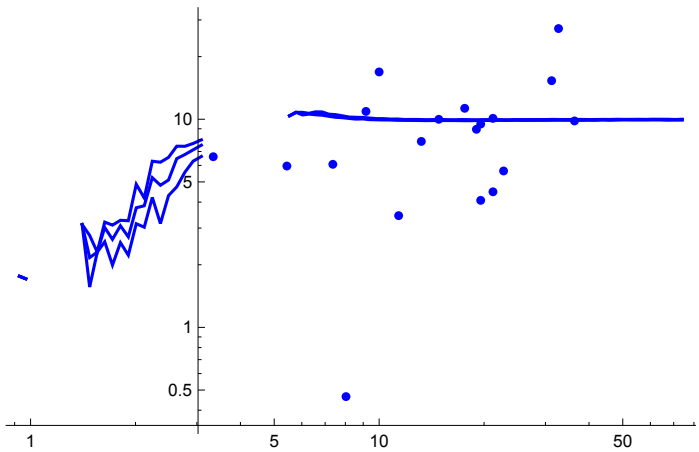
Out[1515]=



D

In[1516]:=
```
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 ]
```

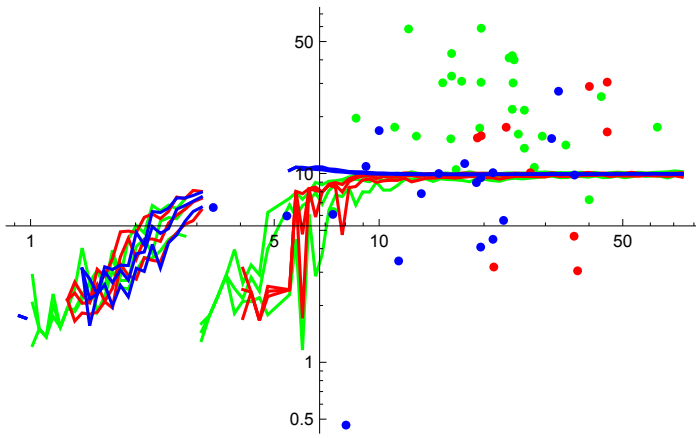
Out[1520]=



C5 and C10 and D

In[1521]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b,
 gr3b, gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → All]
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

Out[1521]=



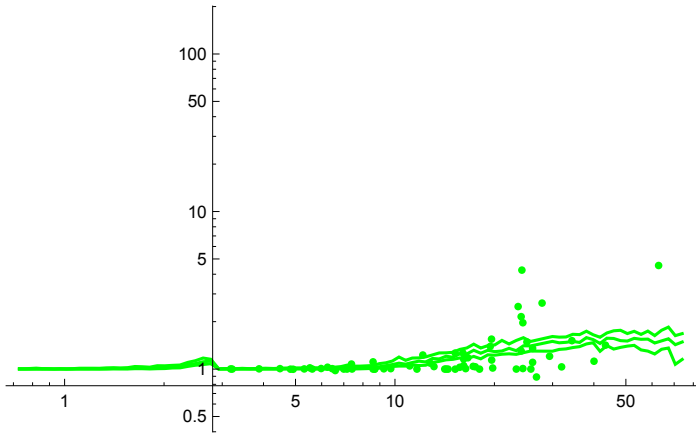
chi2 mono/bi ratio

In[1523]:=
```
simParam = 6;
```

C5

In[1524]:=
```
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"];
 ];
```

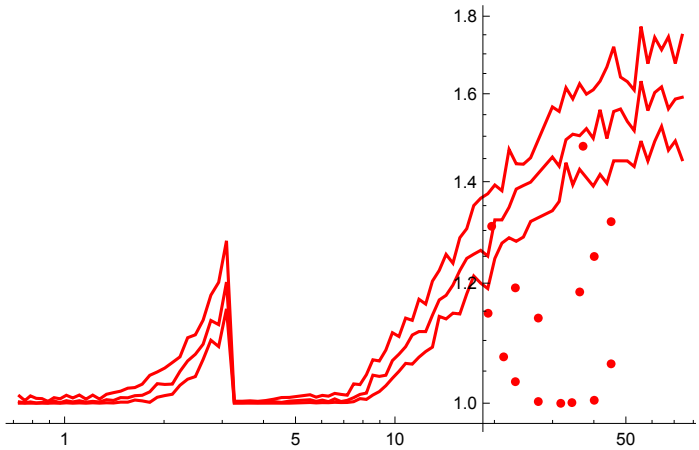
Out[1528]=



C10

In[1530]:=
```
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"];
 ];
```

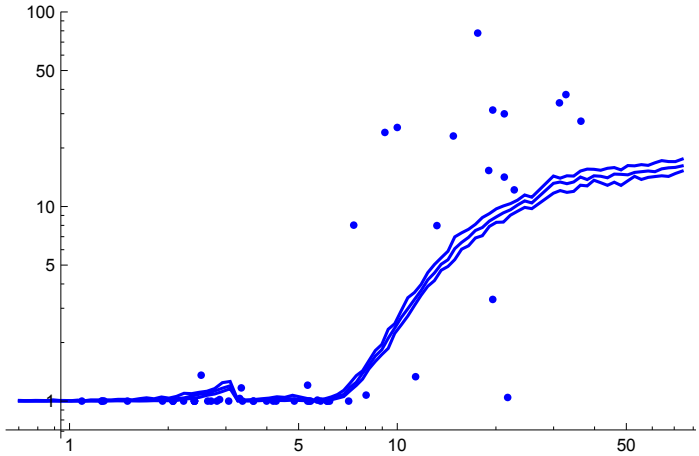
Out[1534]=



D

In[1536]:=
```
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"];
 ];
```

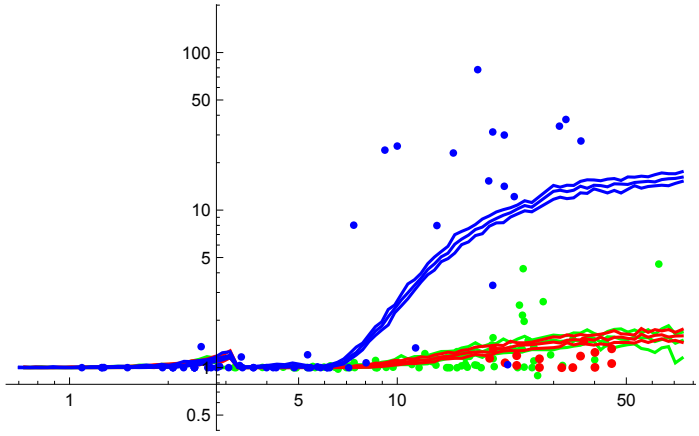
Out[1540]=



C5 and C10 and D

In[1542]:=
```
Show[gr1a, gr2a, gr3a, gr4a, gr1b, gr2b, gr3b,
 gr4b, gr1c, gr2c, gr3c, gr4c, PlotRange → {All, {-0.8, 5}}]
Show[gr1a, gr1b, gr1c, PlotRange → All];
```

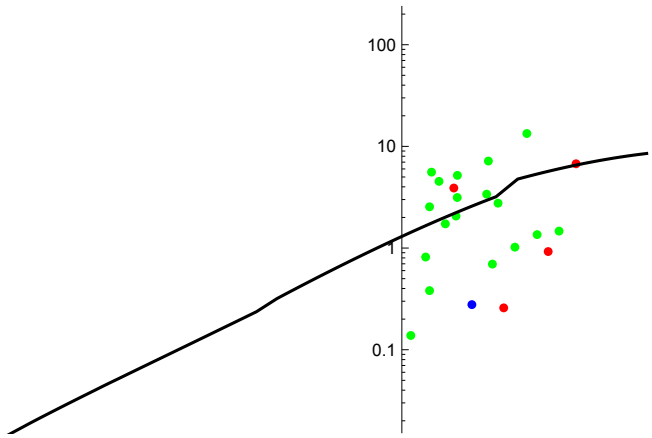
Out[1542]=



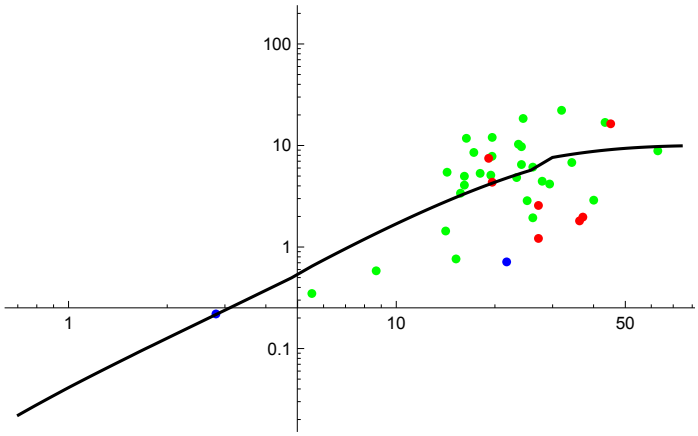
Nv

In[1544]:=
```
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;
 ];
```

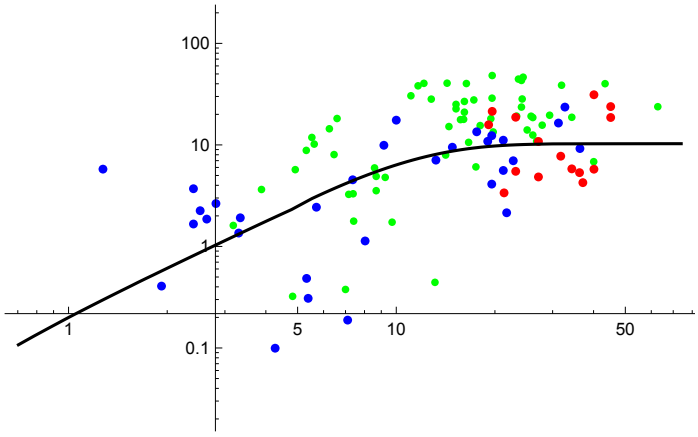
```
time for Nv (ms) = 0.1
```



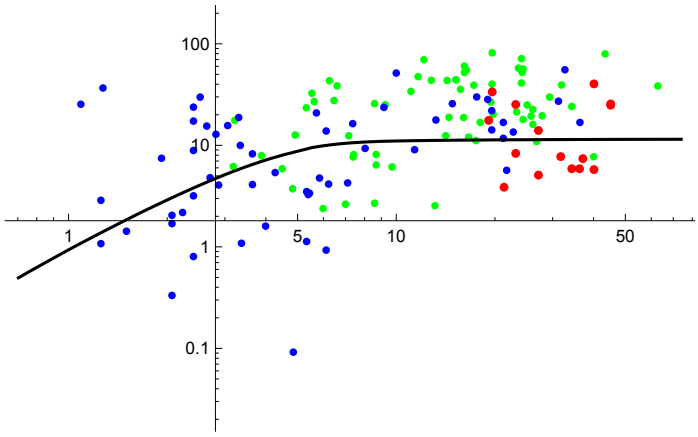

```
time for Nv (ms) = 0.2
```



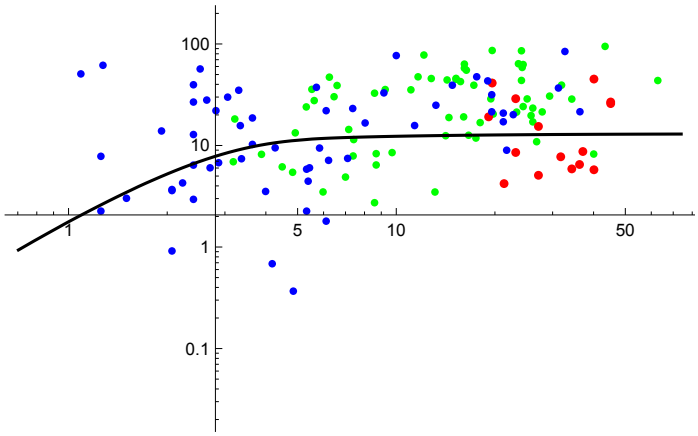
time for Nv (ms) = 1.



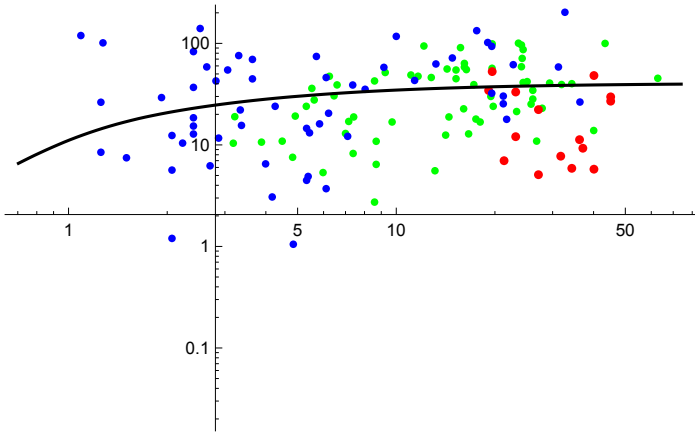
time for Nv (ms) = 5.



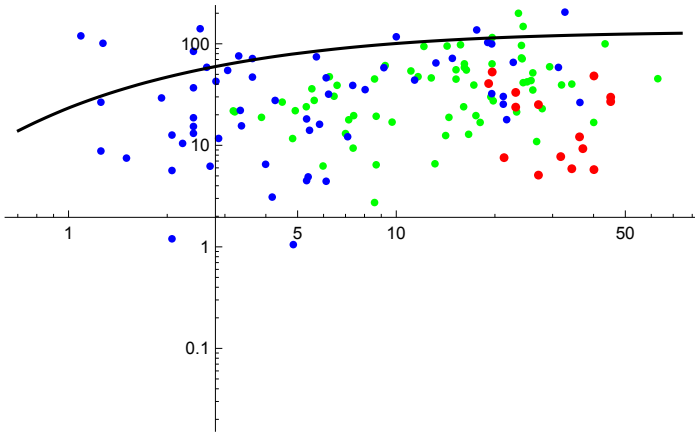
time for Nv (ms) = 10.




```
time for Nv (ms) = 100.
```




```
time for Nv (ms) = 400.
```

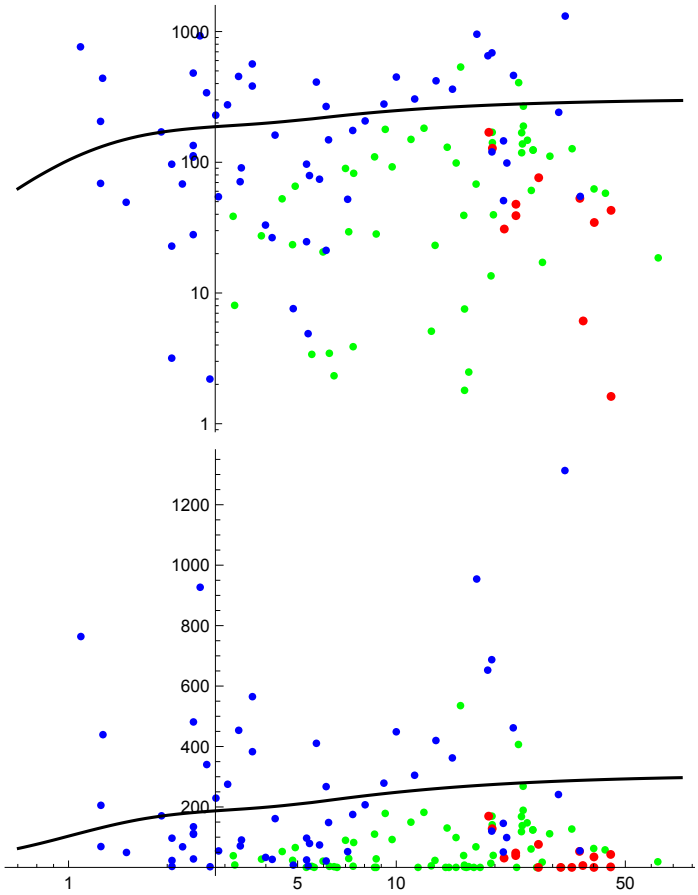


sustained release 10 to 100 ms

In[1545]:=
```
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[1553]:=
```
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[1554]:=
```
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[1555]:=
```
Transpose[simParamMedianC5] // TableForm
Transpose[simParamQuantile1C5] // TableForm
Transpose[simParamQuantile2C5] // TableForm
```

Out[1555]//TableForm=

0	1.10548	9.58594×10^{-16}	0.982318	10.3922	1.00035	-3.32794×10^{-1}
0	1.12249	1.96486×10^{-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	-1.10552×10^{-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	1.17635×10^{-16}
0	1.07012	-0.000669917	1.63049	16.8684	1.00268	-1.94808×10^{-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	3.22749×10^{-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	0.559259	0.0000615432	1.20058	301.627	1.0071	0.000114466
0	0.592455	0.0000185553	1.20046	324.765	1.00536	0.0000467906
0	0.573756	0.0000455912	1.204	353.642	1.0049	0.000137073
0	0.58331	0.0000498767	1.18372	389.907	1.01086	0.000129814
0	0.575069	0.0000360979	1.18612	411.696	1.00745	0.0000838862
0	0.576011	1.5331×10^{-17}	1.18665	444.946	1.01373	0.0000845555
0	0.569974	9.37271×10^{-18}	1.17235	463.526	1.02544	0.000142049
0	0.552885	1.79763×10^{-6}	1.17856	503.281	1.01299	0.0000685356
0	0.57542	-1.08193×10^{-17}	1.17713	516.772	1.01846	0.0000430515
0	0.629216	-0.0000108366	1.17176	570.744	1.02218	0.0000894104
0	0.598388	-0.0000203894	1.18163	578.834	1.03246	0.0000387316
0	0.595481	-0.0000131691	1.1734	635.932	1.03464	0.0000812245
0	0.579679	-0.0000221714	1.17506	660.527	1.05074	0.0000939075
0	0.616825	-0.0000481849	1.18086	678.374	1.06858	0.000100985
0	0.622318	-0.000016445	1.17253	734.494	1.09031	0.000100356
0	0.601811	-0.0000390868	1.17528	754.481	1.07439	0.0000444353
0	0.652443	-0.0000358905	1.16977	821.738	1.10054	0.0000410589
0	0.61638	-0.0000413735	1.16953	871.679	1.12285	0.0000107373
0	0.634408	-0.0000453366	1.16775	925.899	1.10937	0.0000464733
0	0.675794	-0.000064916	1.1683	979.492	1.16751	0.0000254112
0	0.655489	-0.0000397863	1.16269	1040.99	1.15953	0.0000409136
0	0.710453	-0.000037073	1.17247	1085.46	1.20664	0.0000462073
0	0.675408	-0.0000603014	1.16853	1140.59	1.18867	0.0000224722
0	0.670674	-0.0000416467	1.1686	1261.4	1.24994	0.0000388233
0	0.730364	-0.0000541172	1.16232	1332.64	1.24778	0.0000560338
0	0.738062	-0.0000488253	1.16559	1416.46	1.31644	0.0000102447
0	0.760349	-0.000028858	1.16686	1573.99	1.26032	0.0000132483
0	0.771197	-0.0000438492	1.16094	1601.47	1.31539	0.0000115551
0	0.721677	-0.0000325164	1.16351	1819.06	1.29045	0.0000325309
0	0.730657	-0.0000291436	1.16426	1985.38	1.30228	0.0000310805
0	0.783096	-0.0000188062	1.1585	1987.03	1.35395	0.0000334873
0	0.770604	-0.0000299267	1.16228	2017.64	1.30849	0.0000243125
0	0.82248	-0.0000225021	1.15706	2291.66	1.40553	0.0000505342
0	0.796431	-0.0000165491	1.15867	2517.37	1.40283	6.14497×10^{-6}
0	0.838868	-0.0000159971	1.15873	3913.22	1.49917	0.0000826056
0	0.814886	-8.44881×10^{-6}	1.15505	4100.37	1.46806	2.89969×10^{-18}
0	0.813982	-9.25464×10^{-7}	1.15175	4676.82	1.47857	0.000157509
0	0.869296	-7.67101×10^{-6}	1.15617	4249.76	1.49896	0.0000686401
0	0.865878	-2.90115×10^{-17}	1.15629	5228.95	1.4757	0.0000791641
0	0.868248	-7.72739×10^{-6}	1.15815	4589.8	1.58351	0.0000450074
0	0.872997	-1.69477×10^{-6}	1.15578	5337.3	1.53826	0.0000637908
0	0.879071	-4.95846×10^{-6}	1.15892	5037.73	1.45408	0.0000616499
0	0.957088	-7.99876×10^{-6}	1.16162	5362.74	1.57045	0.000117939
0	0.892413	-4.72336×10^{-6}	1.16173	6222.61	1.56397	0.0000214632
0	0.918146	-2.80552×10^{-17}	1.15497	5976.91	1.51509	0.0000726451
0	0.885734	-5.68531×10^{-6}	1.16163	5565.83	1.5063	0.0000994472
0	0.940471	-9.80558×10^{-6}	1.16009	5325.02	1.56688	0.0000444098
0	0.892662	-4.11212×10^{-18}	1.15893	7250.49	1.54504	0.000170962
0	0.9679	-5.93508×10^{-6}	1.16229	6711.93	1.54957	0.0000444524
0	0.939952	-2.30034×10^{-6}	1.16018	6435.96	1.46377	0.000152248

0	0.89633	-3.38085×10^{-6}	1.16024	7724.91	1.5098	0.0000726138
0	0.936757	-1.93973×10^{-6}	1.15726	8038.49	1.55677	0.0000854352
0	0.88795	-6.92278×10^{-8}	1.15482	8062.51	1.42815	0.000143324
0	0.9055	-4.52691×10^{-16}	1.15863	7737.18	1.48541	0.000178906

Out[1556]//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	-0.00023402
0	0.979133	-0.00081078	1.48628	17.0444	1.00173	-1.75058×10
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	-3.55352×10
0	0.998987	-0.00161328	1.69603	22.8001	1.0054	-0.00052112
0	0.958631	-0.00108177	1.71585	22.5551	1.00194	-0.00080124
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	-0.00022787
0	0.978519	-0.00158067	1.81196	27.9121	1.01628	-0.00026716
0	1.01539	-0.00156702	1.82632	30.0936	1.01802	-0.00034855
0	1.03568	-0.00187626	1.84655	31.3793	1.03933	-9.74095×10
0	1.03725	-0.00170367	1.82011	33.7464	1.05762	-0.00005864
0	1.09251	-0.002	1.88535	34.784	1.06847	-9.78825×10
0	1.04825	-0.00201755	1.87134	36.911	1.08242	8.0497×10^{-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	-6.80114×10
0	0.520601	-9.12162×10^{-17}	1.10786	93.5114	1.00045	$-1.5822\times10^{-}$
0	0.519586	-0.0000458151	1.17217	97.345	1.00033	-3.64067×10
0	0.522604	-0.0000586422	1.19787	116.664	1.00035	-5.61178×10
0	0.536648	-0.0000790253	1.13737	135.208	1.00011	-0.00011298
0	0.495388	-0.0000544184	1.17812	134.294	1.00003	-5.31178×10
0	0.519885	-0.000141196	1.20405	154.506	1.00095	-9.40545×10
0	0.520432	0.0000134528	1.18456	192.725	1.00004	0.0000560023
0	0.5093	-0.000106724	1.21732	193.236	1.00062	-0.00002685
0	0.519438	-0.0000576166	1.17572	282.963	1.00179	-0.00003898
0	0.545543	-0.0000756921	1.17969	307.311	1.00057	-0.00006217
0	0.517664	-5.77426×10^{-6}	1.16606	318.876	1.00121	-6.20731×10
0	0.508712	-0.0000156605	1.15559	355.412	1.00123	$2.43559\times10^{-}$
0	0.503469	-0.0000428089	1.1648	380.113	1.00241	-5.31459×10
0	0.514693	-0.000085001	1.16252	403.082	1.00065	-1.99257×10
0	0.507026	-0.0000534865	1.15552	429.229	1.00756	$6.55707\times10^{-}$
0	0.509236	-0.000051909	1.15523	469.336	1.00175	-1.56094×10
0	0.511298	-0.0000841377	1.16169	473.616	1.00353	$-1.6528\times10^{-}$
0	0.522016	-0.000101877	1.15378	508.177	1.00631	-8.33741×10
0	0.495257	-0.0000912718	1.1644	540.242	1.01005	-1.53308×10
0	0.537601	-0.0000732184	1.15721	580.021	1.01358	$3.55761\times10^{-}$
0	0.507522	-0.0000906074	1.16075	617.735	1.02182	$6.45955\times10^{-}$
0	0.541372	-0.000143088	1.16547	627.02	1.0384	0.0000208319

0	0.55816	−0.0000730413	1.15364	689.178	1.04493	$6.41787\times10^{-}$
0	0.547256	−0.000118501	1.15512	701.739	1.04498	-9.24755×10
0	0.593857	−0.000125318	1.15905	751.095	1.06156	−0.0000239
0	0.571808	−0.000135642	1.14799	797.18	1.0531	−0.000015235
0	0.5944	−0.0000823295	1.15024	816.825	1.05788	-2.82336×10
0	0.616325	−0.000136965	1.15434	880.953	1.10001	-8.44199×10
0	0.58792	−0.000120156	1.15057	932.528	1.11935	-1.31389×10
0	0.632281	−0.000117692	1.16263	982.545	1.14466	-2.61111×10
0	0.600267	−0.000119756	1.15662	1021.22	1.15283	-6.16199×10
0	0.596498	−0.0000881017	1.15292	1113.04	1.1764	-2.70537×10
0	0.630023	−0.000134645	1.14776	1125.8	1.16625	-4.64762×10
0	0.652831	−0.000104109	1.15208	1279.64	1.20284	$-9.0447\times10^{-}$
0	0.642835	−0.000088952	1.15569	1259.85	1.16156	-6.21112×10
0	0.65475	−0.0000919393	1.15135	1404.45	1.23105	-8.72613×10
0	0.631541	−0.0000723048	1.15032	1611.35	1.22501	-6.09274×10
0	0.656605	−0.0000862415	1.14493	1524.35	1.2422	-6.97579×10
0	0.665052	−0.000103192	1.1486	1547.44	1.24949	-6.10816×10
0	0.691578	−0.0000647222	1.14747	1665.37	1.24	-1.01536×10
0	0.750892	−0.0000647746	1.14064	1914.81	1.27094	-2.41484×10
0	0.687691	−0.0000619502	1.15179	1837.24	1.30127	-7.52988×10
0	0.762342	−0.0000433706	1.14683	2979.11	1.29812	-4.77288×10
0	0.731307	−0.0000251297	1.14457	3269.82	1.33277	-5.65128×10
0	0.719226	−0.0000219453	1.13795	3657.93	1.34292	$-1.6369\times10^{-}$
0	0.793698	−0.0000242577	1.14447	3574.19	1.36961	-3.68626×10
0	0.746352	−0.0000179456	1.1444	3883.5	1.38785	-6.49961×10
0	0.775959	−0.0000448181	1.15143	3170.47	1.44329	-3.72131×10
0	0.764794	−0.0000165464	1.14608	4212.51	1.47046	-2.09296×10
0	0.786348	−0.0000194955	1.14433	3874.52	1.29687	-3.33513×10
0	0.833187	−0.0000242473	1.14741	3351.5	1.40952	-9.33457×10
0	0.83114	−0.0000215777	1.14582	4083.15	1.33962	$-3.2598\times10^{-}$
0	0.757336	−0.00001441	1.14912	4769.95	1.37296	$2.13988\times10^{-}$
0	0.769839	−0.0000302711	1.14928	4323.46	1.39852	-3.38998×10
0	0.792716	−0.0000246519	1.15029	4297.3	1.41409	$-1.1025\times10^{-}$
0	0.824104	-8.01124×10^{-6}	1.14829	5888.54	1.32312	$1.19584\times10^{-}$
0	0.812126	−0.0000286507	1.14834	3910.07	1.30029	-1.27767×10
0	0.822619	−0.0000150598	1.1426	4384.86	1.24691	$5.19758\times10^{-}$
0	0.805877	−0.0000254599	1.15022	4636.37	1.33571	$-5.1384\times10^{-}$
0	0.814974	−0.0000120785	1.1455	6205.77	1.36059	0.0000105606
0	0.74704	−0.0000147757	1.14553	5937.01	1.07222	-3.32759×10
0	0.754463	-6.79697×10^{-6}	1.14611	6268.7	1.15102	0.0000114216

Out[1557]//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	1.53504×10^{-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	3.73293×10^{-17}	1.94361	29.0985	1.02807	0.001
0	1.21727	3.93095×10^{-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	0.624608	0.000206537	1.24424	351.566	1.01741	0.000261168
0	0.65584	0.000189555	1.22534	369.118	1.01908	0.000244693
0	0.652952	0.000151565	1.23257	385.382	1.01719	0.000301475
0	0.650805	0.000140654	1.22412	456.82	1.03313	0.000285679
0	0.687743	0.000176262	1.20934	475.042	1.02818	0.000330972
0	0.645652	0.000134791	1.20726	486.283	1.03709	0.000259983
0	0.6785	0.000100621	1.19381	513.305	1.06016	0.000221599
0	0.626812	0.0000834066	1.19325	544.102	1.04329	0.0002008
0	0.660144	0.0000684467	1.19471	589.67	1.04403	0.000173857
0	0.720317	0.0000674058	1.18431	630.417	1.04838	0.000247379
0	0.636085	0.0000155872	1.1927	624.077	1.05299	0.000145592
0	0.689292	0.0000417639	1.19189	679.47	1.08276	0.000195911
0	0.661095	0.0000340406	1.19088	742.908	1.09575	0.000151903
0	0.703251	0.0000465905	1.19421	775.692	1.12493	0.000160377
0	0.675125	9.44548×10^{-18}	1.19119	835.944	1.1924	0.000186657
0	0.703567	4.99783×10^{-17}	1.19343	825.103	1.1364	0.0000973354
0	0.747369	-4.46388×10^{-18}	1.19048	909.56	1.17502	0.000104278
0	0.728244	-4.29199×10^{-18}	1.18202	996.383	1.1775	0.0000877559
0	0.710597	-1.76082×10^{-17}	1.18489	1017.52	1.195	0.000110904
0	0.753376	−0.000013262	1.17838	1082.28	1.22975	0.0000611807
0	0.744805	-2.88896×10^{-6}	1.17716	1185.47	1.266	0.000112447
0	0.806994	-5.22956×10^{-18}	1.18162	1238.06	1.26798	0.0000985194
0	0.788354	−0.0000115521	1.17835	1316.86	1.27749	0.000074196
0	0.785897	-8.2292×10^{-18}	1.17541	1466.04	1.33303	0.0000888608
0	0.813639	1.07558×10^{-18}	1.17496	1462.76	1.36081	0.0000985726
0	0.829065	-6.08155×10^{-6}	1.17862	1560.85	1.43941	0.0000523707
0	0.87966	-2.05254×10^{-18}	1.17617	1796.35	1.36063	0.0000826394
0	0.843729	6.5288×10^{-20}	1.17308	1830.78	1.40857	0.0000874306
0	0.836197	-2.12634×10^{-17}	1.17101	1926.12	1.42385	0.0000699814
0	0.884198	-8.36148×10^{-18}	1.17606	2220.92	1.5209	0.0000738773
0	0.873757	-1.7245×10^{-18}	1.1709	2363.07	1.44351	0.000115719
0	0.852359	-4.4793×10^{-18}	1.17254	2499.05	1.51887	0.0000872634
0	0.9098	-1.58287×10^{-18}	1.17015	2791.32	1.58222	0.0000912385
0	0.909866	-7.51527×10^{-18}	1.17181	2920.16	1.49736	0.0000888216
0	0.942628	-3.55948×10^{-18}	1.17479	4760.68	1.60951	0.000190928
0	0.928629	9.09509×10^{-20}	1.16407	5654.73	1.59468	0.000160799

0	0.916026	-1.08445×10^{-19}	1.16421	5539.5	1.59859	0.000190187
0	0.971026	-4.65013×10^{-18}	1.17086	5220.47	1.66209	0.000188848
0	0.961161	7.34537×10^{-19}	1.17179	6344.3	1.65492	0.000189272
0	0.946874	-5.36579×10^{-18}	1.17011	6200.71	1.73907	0.000185693
0	0.967767	-2.02243×10^{-18}	1.16834	6944.39	1.65034	0.000185117
0	0.960839	1.00402×10^{-19}	1.16897	8166.53	1.59199	0.000187603
0	1.10334	-4.3704×10^{-19}	1.17901	7030.61	1.69544	0.000190747
0	0.975644	-5.03251×10^{-18}	1.1726	8220.94	1.74949	0.000187652
0	1.02062	-1.50557×10^{-18}	1.16214	7738.82	1.76257	0.000183952
0	0.98786	-2.21509×10^{-18}	1.16945	6954.24	1.68016	0.000189811
0	1.05399	-2.22475×10^{-18}	1.17528	7522.86	1.73641	0.000183579
0	1.02749	1.75725×10^{-18}	1.17157	10 620.6	1.65929	0.000192295
0	1.09625	-3.39421×10^{-17}	1.16805	8429.75	1.7422	0.000187392
0	1.03412	-5.05422×10^{-19}	1.16816	10 759.7	1.63101	0.000199225
0	0.993903	-1.50405×10^{-17}	1.16772	10 399.4	1.76308	0.000192961
0	1.01192	-2.7671×10^{-18}	1.16808	10 912.6	1.84667	0.000186498
0	1.07601	-7.83597×10^{-19}	1.16738	11 210.4	1.63049	0.000376591
0	1.01795	-2.39359×10^{-19}	1.16866	13 279.4	1.67904	0.000329011

C10

In[1558]:=
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Transpose[simParamMedianC10] // TableForm
Transpose[simParamQuantile1C10] // TableForm
Transpose[simParamQuantile2C10] // TableForm
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Out[1558]//TableForm=

0	1.08101	7.06108×10^{-16}	0.798329	13.3707	1.00197	1.74389×10^{-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	-1.84492×10^{-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	-5.55056×10^{-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	1.12036×10^{-15}	1.59045	16.933	1.00284	0.001
0	1.11456	-0.00044917	1.64612	17.2028	1.00182	7.143×10^{-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	1.21806	0.0000821022	1.20494	322.059	1.00531	0.0000966673
0	1.18252	0.0000384754	1.20199	332.383	1.00283	0.000047057
0	1.1493	0.0000886248	1.1883	368.89	1.00473	0.000113221
0	1.16763	0.000064347	1.18924	377.515	1.00235	0.0000769557
0	1.18134	0.0000302828	1.19227	403.829	1.0066	0.0000978793
0	1.20043	6.21664×10^{-6}	1.18049	434.69	1.00254	0.0000690347
0	1.21291	0.0000231971	1.18254	471.639	1.00436	0.0000740386
0	1.18764	-2.44078×10^{-16}	1.18236	470.405	1.00844	0.0000418791
0	1.19142	6.11566×10^{-17}	1.1813	522.43	1.01345	0.0000686274
0	1.22859	-0.0000275949	1.18218	543.43	1.0155	0.0000218384
0	1.21279	-2.48603×10^{-6}	1.17263	584.856	1.04346	0.0000781592
0	1.26769	-0.0000128822	1.16946	632.866	1.04159	0.0000671531
0	1.24807	-0.0000296001	1.17116	654.552	1.0434	0.0000459106
0	1.22492	-0.0000519555	1.17034	682.416	1.06687	0.0000518625
0	1.32591	-0.0000168262	1.17104	750.077	1.07732	0.0000636398
0	1.23771	-0.0000640288	1.17457	755.797	1.08956	0.0000574197
0	1.30725	-0.0000526527	1.16834	818.69	1.10914	0.0000261759
0	1.28309	-0.0000417469	1.16924	889.888	1.11496	0.0000453278
0	1.33701	-0.0000690641	1.16637	925.355	1.11492	0.0000312676
0	1.37047	-0.000066098	1.16651	990.407	1.14304	0.0000426101
0	1.34866	-0.0000526011	1.16718	1061.44	1.16985	0.0000300673
0	1.32577	-0.0000672503	1.16814	1082.28	1.17798	0.0000128313
0	1.43734	-0.0000859956	1.16295	1155.16	1.19654	0.0000234412
0	1.43751	-0.0000757069	1.16839	1216.67	1.22335	0.0000280681
0	1.40947	-0.0000907697	1.1634	1255.6	1.24601	0.0000185795
0	1.49491	-0.000076562	1.16713	1382.27	1.254	0.0000249975
0	1.50221	-0.0000522379	1.16276	1503.33	1.26139	0.0000331751
0	1.49306	-0.0000677654	1.16018	1566.22	1.25037	1.27145×10^{-6}
0	1.5775	-0.0000538783	1.16062	1673.49	1.32109	0.0000185932
0	1.553	-0.0000585112	1.16291	1721.87	1.32104	0.0000123649
0	1.64125	-0.0000514822	1.15992	1877.04	1.34652	0.0000329178
0	1.57242	-0.0000460898	1.16152	2018.9	1.38436	0.0000202286
0	1.61237	-0.0000540053	1.15821	2202.03	1.3919	1.91572×10^{-6}
0	1.65941	-0.0000504904	1.15944	2249.16	1.39899	0.0000146879
0	1.72351	-0.0000208757	1.15475	3681.04	1.45333	0.0000166397
0	1.71383	-0.0000148986	1.15472	3878.09	1.43336	4.21896×10^{-18}
0	1.70006	-0.0000266773	1.15426	3784.83	1.49219	0.0000182095
0	1.72464	-0.0000192775	1.1528	4316.71	1.50465	0.000037321
0	1.7058	-0.0000118657	1.15323	4916.61	1.50121	0.0000241116
0	1.7155	-0.0000152401	1.15566	4654.49	1.51747	0.0000228698
0	1.74133	-6.89557×10^{-6}	1.15493	5534.51	1.4953	0.0000125282
0	1.76735	-4.96066×10^{-6}	1.1557	6217.84	1.56153	0.000038896
0	1.79529	-0.0000225303	1.15929	4823.49	1.49484	9.08392×10^{-7}
0	1.84155	-9.45862×10^{-6}	1.15194	5705.62	1.55746	0.0000365312
0	1.7893	-0.0000143017	1.15464	5740.48	1.56342	0.0000278062
0	1.78239	-9.65124×10^{-6}	1.15628	6018.01	1.53408	0.0000289679
0	1.78212	-0.000013947	1.15378	6126.26	1.51303	0.0000227962
0	1.85821	-0.0000113285	1.15513	6572.99	1.63095	0.0000204369
0	1.93809	-6.39435×10^{-6}	1.15505	7697.22	1.55962	0.0000647757
0	1.85816	-3.09044×10^{-6}	1.15601	7822.49	1.6029	0.0000507027
0	1.92209	-7.48137×10^{-6}	1.15644	7909.2	1.61673	0.0000500388
0	1.85234	-3.4068×10^{-6}	1.15381	8612.56	1.56379	0.0000920616

0	1.93945	-6.44916×10^{-7}	1.15506	9232.26	1.58722	0.0000917506
0	1.87366	-2.85519×10^{-6}	1.15804	9317.78	1.59146	9.78021×10^{-6}

Out[1559]//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	1.65741×10^{-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	1.80244×10^{-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	4.35673×10^{-16}
0	1.15146	-0.00189946	1.89085	37.9062	1.10039	1.68515×10^{-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	-1.76901×10^{-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	-1.94022×10^{-17}	1.23222	150.744	1.00005	8.04681×10^{-6}
0	1.09461	-0.0000448111	1.21137	171.765	1.00008	-2.3958×10^{-16}
0	1.06456	5.85033×10^{-18}	1.21525	182.84	1.00003	2.89882×10^{-15}
0	1.10898	-1.83709×10^{-17}	1.21043	217.132	1.00005	2.32872×10^{-16}
0	1.0926	8.33624×10^{-6}	1.17808	297.661	1.00105	6.31251×10^{-18}
0	1.11303	-0.0000236817	1.18217	312.075	1.00045	$-2.09147\times10^{-}$
0	1.07156	-0.0000116561	1.17048	334.877	1.00087	0.0000203844
0	1.05942	-0.0000516141	1.16976	361.486	1.00077	-0.0000169182
0	1.07317	-0.0000303787	1.17305	381.493	1.00135	-0.0000203217
0	1.07398	-0.0000559199	1.1644	403.571	1.00099	$-5.18561\times10^{-}$
0	1.13052	-0.0000480862	1.16968	439.842	1.00112	6.74167×10^{-6}
0	1.1006	-0.0000809947	1.16861	454.59	1.00229	-0.0000423996
0	1.098	-0.0000573268	1.16611	482.629	1.00697	0.0000146437
0	1.11292	-0.0000759381	1.16617	516.714	1.00578	$-7.60117\times10^{-}$
0	1.09811	-0.0000714839	1.1604	559.463	1.01251	-2.5422×10^{-17}
0	1.13698	-0.0000716051	1.16224	588.161	1.01784	$-5.14951\times10^{-}$
0	1.11369	-0.000088536	1.16449	613.043	1.02697	$-1.68849\times10^{-}$
0	1.12191	-0.0000844838	1.16058	661.695	1.03861	-1.869×10^{-17}
0	1.20807	-0.0000917751	1.15892	715.934	1.04962	0.0000144034

0	1.15854	−0.000114094	1.16469	700.67	1.06233	3.34956×10^{-17}
0	1.20005	−0.00011218	1.15846	763.986	1.06117	$-2.61244\times10^{-}$
0	1.18611	−0.0000797485	1.15986	826.284	1.07242	$-3.39377\times10^{-}$
0	1.25378	−0.000110749	1.15583	842.726	1.08164	$-8.85819\times10^{-}$
0	1.25143	−0.000106863	1.15805	875.908	1.08891	$-4.20681\times10^{-}$
0	1.24319	−0.000102876	1.15336	942.37	1.14093	-1.1191×10^{-16}
0	1.2224	−0.00013233	1.15749	971.015	1.13658	−0.0000165418
0	1.30329	−0.0001	1.15629	1058.49	1.14655	−0.0000147469
0	1.29913	−0.000123634	1.16051	1093.37	1.14517	$-1.50379\times10^{-}$
0	1.26321	−0.000112603	1.15441	1111.42	1.1807	-1.9164×10^{-17}
0	1.37228	−0.000115055	1.15927	1194.06	1.21311	-4.8017×10^{-17}
0	1.37471	−0.0000875129	1.15431	1410.61	1.20001	$-3.03049\times10^{-}$
0	1.33592	−0.000121023	1.15552	1404.11	1.19014	−0.0000190607
0	1.40245	−0.0001	1.15299	1459.81	1.24587	−0.0000190343
0	1.41881	−0.000101886	1.15597	1501.04	1.27525	$-2.94004\times10^{-}$
0	1.52571	−0.000103739	1.15291	1611.09	1.28569	$-6.63789\times10^{-}$
0	1.4674	−0.0001	1.15108	1647.09	1.27877	$-9.36224\times10^{-}$
0	1.46393	−0.0000989666	1.15007	1984.56	1.28709	$-5.67698\times10^{-}$
0	1.51331	−0.000104411	1.15138	1822.42	1.31788	$-9.18836\times10^{-}$
0	1.59267	−0.0001	1.14517	2724.45	1.33959	-7.0145×10^{-18}
0	1.59527	−0.0000520022	1.14956	3079.66	1.35856	$-2.85036\times10^{-}$
0	1.59334	−0.000108566	1.14851	2526.12	1.44104	-1.8922×10^{-17}
0	1.59244	−0.000100953	1.14385	2764.88	1.39328	$-1.06096\times10^{-}$
0	1.61714	−0.0000397007	1.14304	3618.29	1.42651	$-3.12709\times10^{-}$
0	1.56972	−0.000103875	1.14765	2793.91	1.4085	$-7.99851\times10^{-}$
0	1.61462	−0.0000367005	1.15095	3836.27	1.39065	$-3.57974\times10^{-}$
0	1.65259	−0.0000247076	1.15004	4138.69	1.41544	0.000013332
0	1.6398	−0.000106244	1.15267	3054.85	1.39671	$-6.75315\times10^{-}$
0	1.68571	−0.00010051	1.14698	3965.67	1.44503	$-1.37725\times10^{-}$
0	1.58399	−0.0000413903	1.15053	4475.54	1.44499	$-3.12553\times10^{-}$
0	1.64301	−0.0000702155	1.14746	3657.34	1.44487	$-2.10137\times10^{-}$
0	1.62381	−0.0000352873	1.14665	4225.97	1.43257	$-7.32838\times10^{-}$
0	1.68901	−0.000104439	1.14767	3311.38	1.48907	$-6.06601\times10^{-}$
0	1.70859	−0.0000470825	1.14514	4058.71	1.44473	$-2.04664\times10^{-}$
0	1.73419	−0.0000313389	1.15015	5202.37	1.48839	$-1.56508\times10^{-}$
0	1.71798	−0.000102674	1.14719	3519.8	1.52259	$-9.51345\times10^{-}$
0	1.67393	−0.0000153962	1.14651	7095.91	1.46848	$-4.86331\times10^{-}$
0	1.74626	−0.0000232222	1.14712	7087.08	1.48933	$-3.53858\times10^{-}$
0	1.73662	−0.0001	1.14923	4321.36	1.44763	$-8.86352\times10^{-}$

Out[1560]//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	-4.03457×10^{-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	1.46597×10^{-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	1.28963	0.000158778	1.22359	341.732	1.01293	0.0002
0	1.30064	0.0001	1.2201	357.272	1.00921	0.000131298
0	1.28374	0.000138669	1.20671	393.336	1.01195	0.000212521
0	1.21027	0.000122785	1.20758	420.328	1.01077	0.000165002
0	1.26806	0.0000855098	1.206	437.113	1.01502	0.000151649
0	1.32012	0.000083417	1.20232	472.84	1.01347	0.000141947
0	1.31145	0.000109035	1.19428	491.655	1.01223	0.000154451
0	1.28495	0.0000540879	1.19434	520.545	1.02975	0.000118881
0	1.27145	0.0000392055	1.19556	546.355	1.02867	0.000119761
0	1.34694	5.06732×10^{-17}	1.19539	578.463	1.04428	0.0001
0	1.33272	0.0000237706	1.18236	628.529	1.06816	0.000137457
0	1.3445	0.0000292769	1.18516	665.936	1.06626	0.000143816
0	1.32085	5.17734×10^{-6}	1.18381	703.607	1.08412	0.000102821
0	1.31627	-5.0585×10^{-18}	1.17952	734.329	1.11299	0.00010927
0	1.42806	5.58518×10^{-6}	1.17758	808.369	1.10662	0.000112621
0	1.34007	-2.44683×10^{-6}	1.18309	798.444	1.13797	0.000113784
0	1.4392	-1.10749×10^{-17}	1.18374	894.229	1.13411	0.0000917456
0	1.3722	-4.44368×10^{-6}	1.17903	949.485	1.17106	0.0001
0	1.41599	-0.0000239153	1.17548	1005.05	1.16249	0.0000812272
0	1.46018	-7.13986×10^{-6}	1.17764	1100.72	1.20377	0.000084862
0	1.48014	-7.01149×10^{-6}	1.17613	1110.15	1.22349	0.0000819525
0	1.51962	-0.0000218734	1.17815	1186.03	1.25367	0.0000650132
0	1.57662	-0.0000314568	1.17226	1257.81	1.2369	0.0000654799
0	1.54138	-0.0000282097	1.17377	1302.59	1.28576	0.0000551735
0	1.52452	-0.0000373269	1.17142	1411.63	1.30361	0.0000517411
0	1.57573	-0.0000249097	1.17331	1475.34	1.35005	0.0000550911
0	1.57066	-0.0000175836	1.17163	1716.83	1.36528	0.000061773
0	1.58783	-0.0000234392	1.16832	1755.32	1.37448	0.0000372464
0	1.70586	-0.0000144601	1.16977	1869.71	1.3929	0.0000521368
0	1.68495	-0.0000138957	1.17123	2071.45	1.38091	0.0000415885
0	1.78827	-0.0000254202	1.16811	2176.34	1.47039	0.0000541522
0	1.67082	-0.0000168347	1.17031	2308.77	1.43857	0.0000439506
0	1.77518	-7.00926×10^{-6}	1.16551	2614.03	1.43765	0.0000398561
0	1.7978	-0.0000143833	1.16616	2719.74	1.45176	0.0000486387
0	1.89326	-4.79949×10^{-18}	1.16434	4558.88	1.56833	0.000055941
0	1.82481	-8.86719×10^{-18}	1.16245	4718.12	1.55762	0.0000552888
0	1.84923	-4.54774×10^{-6}	1.1658	4761.89	1.6147	0.000052841
0	1.8796	-3.24593×10^{-18}	1.16281	5300.14	1.58754	0.0000581584
0	1.81726	-1.42536×10^{-17}	1.16297	5512.27	1.62432	0.0000650271

0	1.88967	-1.46712×10^{-6}	1.16486	5923.73	1.59908	0.0000552354
0	1.92526	-7.0261×10^{-18}	1.15971	6522.84	1.60963	0.0000469442
0	1.92122	1.35884×10^{-19}	1.16341	7447.44	1.63089	0.000093452
0	1.95904	-3.39812×10^{-6}	1.16709	6227.25	1.6664	0.0000695821
0	1.9088	-5.15836×10^{-16}	1.15961	7166.38	1.71835	0.0000955114
0	1.92753	-2.74741×10^{-18}	1.16345	7379.18	1.64102	0.0000939777
0	1.93185	-2.84088×10^{-8}	1.16146	7743.82	1.6297	0.0000735736
0	1.89004	-3.37223×10^{-18}	1.16182	7895.65	1.6091	0.000093234
0	2.02001	-1.03392×10^{-6}	1.16195	8430.79	1.77189	0.0000951836
0	2.04742	-4.12465×10^{-18}	1.16758	9461.73	1.67485	0.0000956432
0	2.01027	2.82822×10^{-18}	1.16156	9532.7	1.74299	0.0000951286
0	2.05115	-1.61744×10^{-17}	1.16556	9764.96	1.71064	0.0000934037
0	2.13598	-1.698×10^{-18}	1.16402	10 298.	1.74436	0.0000950424
0	2.12662	5.06491×10^{-19}	1.16044	11 313.7	1.67528	0.000094467
0	2.0208	-1.42218×10^{-18}	1.16715	12 486.4	1.74844	0.0000945508

D

In[1561]:=
```
Transpose[simParamMedianD] // TableForm
Transpose[simParamQuantile1D] // TableForm
Transpose[simParamQuantile2D] // TableForm
```

Out[1561]//TableForm=

0	1.09769	1.87869×10^{-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	-9.27033×10^{-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	-1.33233×10^{-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	1.45885×10^{-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	-2.28321×10^{-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	0.0496966	0.0000698101	1.19812	317.519	1.00436	0.0000658878
0	0.0493213	0.0000640721	1.19558	339.373	1.00679	0.0000689608
0	0.0522558	0.0000431933	1.19411	359.477	1.0082	0.0000550378
0	0.0541383	0.0000379293	1.1896	384.42	1.02859	0.0000573859
0	0.0545588	0.0000285891	1.18776	409.412	1.05507	0.0000563258
0	0.0562078	0.0000232305	1.1843	435.136	1.08196	0.0000551257
0	0.0592348	6.05469×10^{-6}	1.1822	462.001	1.17626	0.0000545621
0	0.0637903	3.61716×10^{-6}	1.18029	491.277	1.24943	0.0000526743
0	0.0685195	-9.96975×10^{-6}	1.17778	522.872	1.39116	0.0000454277
0	0.0778403	-0.0000178574	1.17766	549.995	1.52556	0.0000460746
0	0.085562	-0.0000266784	1.17523	586.736	1.70391	0.0000426274
0	0.0926135	-0.000026129	1.17494	620.446	1.83558	0.0000437384
0	0.105275	-0.0000381286	1.17246	653.266	2.10416	0.0000370948
0	0.119104	-0.0000447115	1.17087	693.469	2.37379	0.0000346686
0	0.132746	-0.0000486514	1.16995	734.428	2.68809	0.0000305686
0	0.150012	-0.000051851	1.17065	775.905	2.98392	0.0000321599
0	0.165564	-0.0000578806	1.16948	821.399	3.32535	0.0000267619
0	0.185617	-0.0000637795	1.16803	864.41	3.69936	0.0000267803
0	0.196642	-0.0000667311	1.16758	917.692	4.19603	0.000022865
0	0.219628	-0.0000680807	1.16657	972.67	4.55713	0.0000237436
0	0.244009	-0.0000726331	1.16667	1019.46	5.05082	0.0000206047
0	0.264619	-0.0000716158	1.16544	1082.74	5.32517	0.0000203847
0	0.280129	-0.0000718738	1.16399	1149.28	6.07529	0.0000163743
0	0.311239	-0.0000680079	1.16305	1226.88	6.5416	0.0000195888
0	0.327263	-0.0000702818	1.16376	1286.05	6.93952	0.0000168293
0	0.343835	-0.000069313	1.16298	1389.47	7.53108	0.0000153029
0	0.368552	-0.0000681759	1.16211	1452.31	7.80246	0.000015394
0	0.395315	-0.0000630965	1.1614	1559.89	8.41584	0.0000169864
0	0.411479	-0.000060722	1.16081	1671.31	8.84816	0.0000157789
0	0.434585	-0.0000587315	1.16013	1766.68	9.28088	0.0000162633
0	0.449826	-0.0000506038	1.15935	1924.01	9.62094	0.0000171985
0	0.471315	-0.0000489622	1.158	2045.51	10.1765	0.0000174067
0	0.48632	-0.0000437641	1.15774	2212.27	10.6894	0.0000164871
0	0.502295	-0.0000394987	1.15804	2361.17	10.4354	0.0000160114
0	0.599125	-0.0000189808	1.15247	3896.72	13.1583	0.0000148089
0	0.606535	-0.000015727	1.15305	4211.89	13.3668	0.0000150026
0	0.623415	-0.0000138372	1.1525	4410.16	13.1026	0.0000168529
0	0.638899	-0.000014041	1.1522	4635.77	13.3725	0.0000170309
0	0.63744	-0.0000112339	1.15284	4863.	14.1777	0.0000197614
0	0.642575	-0.0000105699	1.15186	5229.54	13.7581	0.0000198402
0	0.66455	-9.8326×10^{-6}	1.15303	5451.9	14.3853	0.0000154955
0	0.666399	-8.62347×10^{-6}	1.15233	5827.72	14.3084	0.000020743
0	0.66524	-7.03719×10^{-6}	1.15207	6164.33	14.0513	0.0000161641
0	0.689879	-7.14382×10^{-6}	1.15211	6471.45	14.6826	0.0000215474
0	0.687378	-4.85646×10^{-6}	1.15253	6965.71	14.6371	0.0000196058
0	0.690906	-4.4446×10^{-6}	1.15223	7272.33	14.5496	0.0000283225
0	0.692161	-4.12639×10^{-6}	1.15255	7708.58	14.9748	0.0000233866
0	0.693953	-4.87702×10^{-6}	1.15264	7784.6	15.1003	0.0000238505
0	0.714709	-3.91374×10^{-6}	1.1524	8408.42	15.2294	0.0000216139
0	0.716723	-3.20625×10^{-6}	1.15282	8837.31	15.0985	0.0000287912
0	0.720065	-3.10508×10^{-6}	1.153	9013.96	15.62	0.0000287245
0	0.734829	-2.09737×10^{-6}	1.15268	9783.63	15.8127	0.0000219088
0	0.739936	-1.56107×10^{-6}	1.15309	10 101.8	15.892	0.0000354161
0	0.742949	-2.21832×10^{-6}	1.1536	10 312.	16.1807	0.0000319358

Out[1562]//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	-1.80091×10
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	-2.12221×10
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	-7.24511×10
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	0.0462902	0.000054788	1.19572	312.831	1.00086	0.000054900
0	0.0452965	0.0000421933	1.19244	336.149	1.00172	0.000046455
0	0.0481642	0.0000309533	1.19176	355.49	1.00253	0.000040448
0	0.0473865	0.0000268601	1.18526	379.651	1.01526	0.000048016
0	0.0512266	0.0000148694	1.18372	404.695	1.03444	0.000041173
0	0.0513176	0.0000107672	1.18176	431.049	1.05485	0.000044137
0	0.0537303	-1.57803×10^{-17}	1.18035	456.829	1.12843	0.000038453
0	0.0564059	-9.58919×10^{-6}	1.17786	486.341	1.20302	0.000037793
0	0.0628966	−0.0000183264	1.17605	516.387	1.29749	0.000036654
0	0.0719371	−0.0000295195	1.17503	543.105	1.46294	0.000038957
0	0.0777254	−0.0000331736	1.17214	579.492	1.59972	0.000030567
0	0.0869055	−0.0000389204	1.17234	612.166	1.73333	0.000030092
0	0.0957092	−0.0000496825	1.17106	643.999	1.86676	0.000025954
0	0.111419	−0.0000515885	1.16838	684.835	2.22879	0.000024643
0	0.122199	−0.0000580572	1.16767	724.959	2.46429	0.000021913
0	0.142081	−0.0000589191	1.16811	760.408	2.73755	0.000024316
0	0.157277	−0.0000714042	1.16743	805.041	3.09819	0.000021711
0	0.177736	−0.0000727566	1.16646	851.266	3.49579	0.000019649
0	0.189361	−0.0000766899	1.16591	906.682	3.88993	0.000011889
0	0.205846	−0.000077239	1.16479	960.255	4.16191	0.000015410
0	0.234905	−0.0000845165	1.16453	1000.79	4.70598	0.000011323
0	0.248243	−0.0000822764	1.16345	1059.2	4.92042	0.000012007
0	0.267809	−0.0000847943	1.16258	1122.01	5.33572	0.000010899
0	0.290185	−0.0000778872	1.16132	1203.21	6.03639	0.000011998
0	0.308506	−0.0000793592	1.16199	1265.02	6.28185	$8.03092\times 10^{-}$

0	0.33509	−0.0000785687	1.16065	1345.39	6.89432	$9.91355\times10^{-}$
0	0.35671	−0.0000793345	1.16021	1419.82	7.07975	$9.46425\times10^{-}$
0	0.381155	−0.0000700315	1.15954	1539.33	7.90287	0.000010383
0	0.391517	−0.0000737275	1.15853	1628.11	8.29455	$4.11611\times10^{-}$
0	0.414561	−0.0000701192	1.15863	1711.41	8.32036	$4.29797\times10^{-}$
0	0.434231	−0.000057662	1.15789	1874.59	9.02836	0.000010548
0	0.458243	−0.0000546464	1.15689	2005.37	9.46008	0.000011381
0	0.466274	−0.0000501335	1.15566	2128.01	9.89828	$9.14666\times10^{-}$
0	0.488763	−0.0000479248	1.15633	2281.21	9.75326	0.000010136
0	0.576413	−0.0000225765	1.15017	3791.65	11.7113	0.000010192
0	0.587805	−0.0000190326	1.15181	3993.6	12.0807	$8.52925\times10^{-}$
0	0.60541	−0.0000201816	1.15115	4187.88	11.8238	0.000010459
0	0.61002	−0.0000168357	1.15127	4445.13	11.9648	$8.33004\times10^{-}$
0	0.622143	−0.0000143887	1.15137	4649.31	12.8712	0.000012622
0	0.620116	−0.0000124304	1.15084	5055.	12.766	$9.20578\times10^{-}$
0	0.643381	−0.0000137722	1.1518	5267.74	13.6476	$3.25179\times10^{-}$
0	0.648132	−0.0000105768	1.15072	5421.72	13.2576	8.7334×10^{-6}
0	0.64234	−0.0000103555	1.15093	5911.18	12.8521	$6.24918\times10^{-}$
0	0.659434	-9.72707×10^{-6}	1.15013	6202.11	13.3371	0.000011671
0	0.661514	-7.45361×10^{-6}	1.15106	6550.91	12.8389	$9.41292\times10^{-}$
0	0.672258	-6.97262×10^{-6}	1.15125	7086.67	13.5565	0.000016976
0	0.672745	-6.71817×10^{-6}	1.15139	7367.	14.2939	$7.60425\times10^{-}$
0	0.678763	-6.95505×10^{-6}	1.15154	7527.33	13.7757	$6.84534\times10^{-}$
0	0.701225	-5.00684×10^{-6}	1.15106	8154.54	14.118	0.000010818
0	0.691044	-5.23495×10^{-6}	1.15098	8318.79	14.2571	$9.15005\times10^{-}$
0	0.698412	-4.57201×10^{-6}	1.15167	8584.7	14.3866	-9.30074×1
0	0.699369	-4.20364×10^{-6}	1.15153	9192.65	14.2788	$2.37016\times10^{-}$
0	0.712314	-3.05679×10^{-6}	1.15123	9696.99	14.782	$4.13992\times10^{-}$
0	0.713533	-3.3292×10^{-6}	1.15169	10 005.2	15.209	$3.48606\times10^{-}$

Out[1563]//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	1.47724×10^{-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	2.33315×10^{-14}	1.96138	24.8313	1.01517	0.001
0	1.1548	8.86247×10^{-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	-3.05833×10^{-17}	1.92742	28.2752	1.02773	0.00173965
0	1.23074	-1.58576×10^{-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	0.0543897	0.0000828384	1.20502	320.365	1.01544	0.0000883105
0	0.0562472	0.0000799379	1.19919	343.407	1.01773	0.000104714
0	0.0557914	0.0000566391	1.1967	362.424	1.02904	0.0000671361
0	0.0581573	0.0000517995	1.1933	389.758	1.05092	0.0000723466
0	0.0591664	0.0000403736	1.1905	414.003	1.08159	0.0000701396
0	0.0638021	0.0000339932	1.18818	441.075	1.13604	0.0000651521
0	0.0652853	0.0000183799	1.18454	466.511	1.23539	0.000062983
0	0.070977	0.000016543	1.18237	495.486	1.35155	0.0000692773
0	0.0728413	2.18735×10^{-6}	1.18041	527.445	1.431	0.0000602635
0	0.0830464	-5.24736×10^{-6}	1.18023	559.094	1.61358	0.0000552766
0	0.0923613	-0.000014357	1.1769	593.323	1.81917	0.0000518992
0	0.0979538	-0.0000190954	1.17648	625.281	1.9529	0.0000488845
0	0.112405	-0.0000277946	1.17668	661.593	2.33959	0.0000472995
0	0.128831	-0.0000354987	1.17308	703.5	2.49846	0.0000432962
0	0.141594	-0.0000428434	1.173	744.707	2.9171	0.0000408539
0	0.156273	-0.0000451866	1.17359	785.692	3.39875	0.0000426259
0	0.178355	-0.0000478071	1.17134	830.249	3.61356	0.0000367569
0	0.19515	-0.0000495279	1.17044	881.208	3.9723	0.0000362485
0	0.215358	-0.0000584893	1.16918	928.907	4.57253	0.0000332955
0	0.237179	-0.0000584003	1.16788	983.256	5.03512	0.0000309396
0	0.257522	-0.0000638281	1.16829	1038.25	5.45249	0.0000264024
0	0.279348	-0.00006182	1.16698	1102.97	5.89164	0.0000271194
0	0.29955	-0.0000619261	1.16596	1176.72	6.98325	0.0000217681
0	0.325376	-0.0000616895	1.16514	1256.07	7.32471	0.0000254672
0	0.343093	-0.0000629964	1.16523	1316.31	7.63459	0.0000236419
0	0.363568	-0.0000581356	1.16516	1415.79	8.10087	0.0000249216
0	0.396242	-0.0000582657	1.16345	1503.08	8.77741	0.0000215648
0	0.408622	-0.0000549667	1.16329	1592.07	9.19268	0.0000211219
0	0.425927	-0.0000491841	1.16229	1736.56	9.73266	0.0000229932
0	0.448641	-0.0000527316	1.16296	1818.29	10.0689	0.0000217191
0	0.460234	-0.0000412099	1.16115	1991.38	10.3506	0.0000201562
0	0.485782	-0.0000422741	1.16003	2104.86	10.7826	0.0000230924
0	0.504022	-0.0000334557	1.1594	2312.5	11.4663	0.0000229388
0	0.526876	-0.0000364776	1.1596	2433.	11.1695	0.0000212362
0	0.628602	-0.0000148602	1.15401	4032.84	14.346	0.0000251782
0	0.622724	-0.0000118937	1.15478	4316.22	13.9819	0.0000225577
0	0.64679	-9.66012×10^{-6}	1.15427	4575.29	14.3854	0.0000243819
0	0.658835	-0.0000101209	1.15363	4815.	14.3391	0.0000234867
0	0.655249	-8.01507×10^{-6}	1.15434	5139.15	15.2187	0.0000263118
0	0.669537	-7.73451×10^{-6}	1.15342	5463.11	15.5704	0.0000246575
0	0.68487	-6.76767×10^{-6}	1.15426	5652.59	15.5342	0.0000239723
0	0.681503	-5.25587×10^{-6}	1.1538	6146.39	15.3615	0.0000295456
0	0.680137	-4.85567×10^{-6}	1.15331	6351.61	15.723	0.0000285527
0	0.707051	-5.58396×10^{-6}	1.15311	6675.53	15.8602	0.0000303701
0	0.712492	-3.55123×10^{-6}	1.15425	7161.41	15.4217	0.0000308971
0	0.707959	-2.93868×10^{-6}	1.15351	7580.62	16.239	0.0000369385
0	0.7092	-2.22633×10^{-6}	1.15408	7865.86	16.1837	0.0000332533
0	0.715265	-2.65034×10^{-6}	1.15445	8155.16	16.4214	0.0000362334
0	0.731139	-2.38886×10^{-6}	1.15397	8763.61	16.2736	0.0000423015
0	0.747233	-1.15278×10^{-6}	1.15429	9094.18	16.7835	0.0000440138

0	0.746034	-2.43147×10^{-6}	1.15442	9431.38	17.2196	0.0000498754
0	0.75444	-1.06281×10^{-6}	1.1543	10 041.4	17.0261	0.0000598147
0	0.763783	-3.31466×10^{-18}	1.15421	10 696.3	17.0166	0.0000901044
0	0.763868	-9.80844×10^{-7}	1.15507	10 769.	17.5307	0.0000911154

Nv

In[1564]:=
```
Transpose[simParamNv] // TableForm
```

Out[1564]//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
0.0318492	0.0648821	0.296443	0.950337	1.15738	3.09028	8.361
0.0342596	0.0697616	0.315998	0.972224	1.16669	3.12279	8.500
0.0368527	0.0750037	0.336576	0.992292	1.17494	3.15459	8.638
0.0396423	0.0806339	0.358184	1.01048	1.18228	3.1857	8.773
0.0426426	0.0866781	0.380817	1.02676	1.18888	3.2161	8.907
0.0458686	0.0931641	0.404462	1.04112	1.19488	3.2458	9.040
0.0493447	0.100125	0.429123	1.05368	1.20039	3.27481	9.170
0.0530733	0.107586	0.454703	1.0645	1.2055	3.3031	9.298
0.0570788	0.115577	0.481173	1.07373	1.21029	3.3307	9.425
0.0613839	0.124138	0.50844	1.08152	1.21481	3.35759	9.549
0.0660014	0.13329	0.536464	1.08807	1.21909	3.38378	9.671
0.0709664	0.143084	0.565117	1.09357	1.22317	3.40929	9.791
0.0762759	0.15353	0.59426	1.09818	1.22707	3.4341	9.908

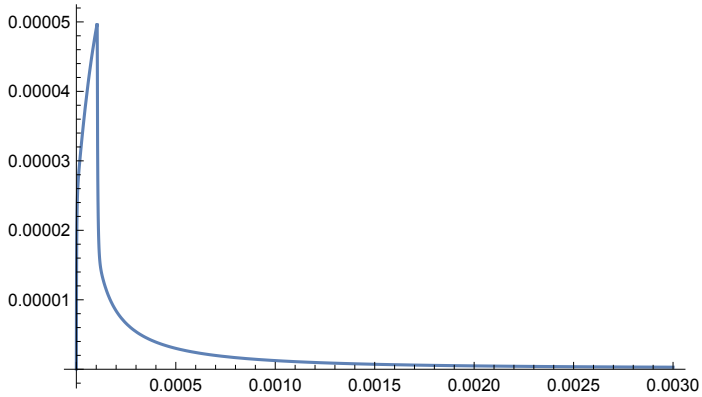
0.0819573	0.164668	0.623751	1.10209	1.23078	3.45822	10.02
0.0880875	0.176581	0.653446	1.10544	1.23433	3.48167	10.13
0.0946306	0.189248	0.683135	1.10836	1.23772	3.50444	10.24
0.101641	0.202728	0.71263	1.11096	1.24097	3.52653	10.35
0.109141	0.217048	0.741716	1.1133	1.24406	3.54797	10.46
0.117157	0.232241	0.770172	1.11546	1.24702	3.56875	10.56
0.125726	0.248338	0.797773	1.11746	1.24984	3.58888	10.66
0.134875	0.265366	0.824294	1.11933	1.25254	3.60838	10.76
0.144634	0.283343	0.84952	1.1211	1.25511	3.62723	10.85
0.155036	0.302286	0.87325	1.12277	1.25757	3.64548	10.95
0.166105	0.322209	0.895309	1.12435	1.25992	3.66311	11.04
0.177881	0.343111	0.915553	1.12584	1.26215	3.68013	11.12
0.190382	0.364983	0.933872	1.12726	1.26429	3.69657	11.21
0.203658	0.387824	0.950205	1.1286	1.26632	3.71242	11.29
0.21772	0.411591	0.964536	1.12988	1.26826	3.72772	11.37
0.232605	0.436261	0.976891	1.13108	1.27011	3.74243	11.45
0.248321	0.461768	0.98735	1.13222	1.27188	3.75663	11.53
0.26493	0.488079	0.996038	1.13331	1.27356	3.77027	11.60
0.282366	0.515053	1.0031	1.13433	1.27516	3.78345	11.67
0.300684	0.542606	1.00874	1.13531	1.27669	3.79606	11.74
0.319936	0.570673	1.01314	1.13623	1.27814	3.8082	11.80
0.477046	0.762426	1.02364	1.13927	1.28265	3.84227	11.99
0.496807	0.782772	1.02416	1.13989	1.2837	3.85178	12.04
0.516903	0.802486	1.02459	1.14049	1.28471	3.86091	12.09
0.537306	0.821492	1.02496	1.14106	1.28566	3.86965	12.14
0.55793	0.839678	1.02528	1.14161	1.28658	3.87804	12.18
0.578753	0.856995	1.02557	1.14212	1.28745	3.88606	12.23
0.599682	0.873357	1.02583	1.14262	1.28829	3.89377	12.27
0.620694	0.88872	1.02607	1.14309	1.28908	3.90113	12.31
0.641695	0.903034	1.02629	1.14354	1.28984	3.90821	12.35
0.662627	0.916265	1.02651	1.14396	1.29057	3.91495	12.39
0.683411	0.928399	1.02671	1.14437	1.29126	3.92143	12.43
0.703977	0.939429	1.02689	1.14476	1.29192	3.92763	12.46
0.724254	0.949368	1.02707	1.14513	1.29256	3.93356	12.50
0.744137	0.958229	1.02724	1.14548	1.29316	3.93924	12.53
0.763577	0.96606	1.0274	1.14582	1.29374	3.94468	12.56
0.782485	0.972902	1.02755	1.14614	1.29429	3.94987	12.59
0.800787	0.978819	1.0277	1.14645	1.29482	3.95485	12.62
0.81842	0.983875	1.02783	1.14674	1.29532	3.95962	12.65
0.835322	0.988148	1.02796	1.14702	1.2958	3.96417	12.67
0.851423	0.991712	1.02808	1.14729	1.29626	3.96853	12.70

EPSC with different caRest

Interpolate

In[1565]:=
```
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]
```

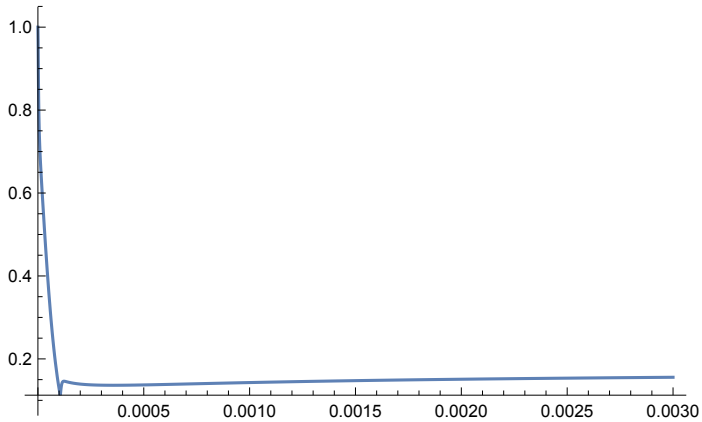
Out[1569]=



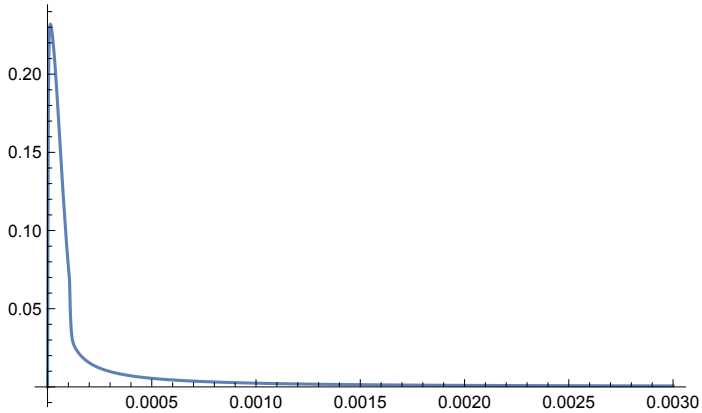
NDSolve

In[1570]:=
```
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]
```

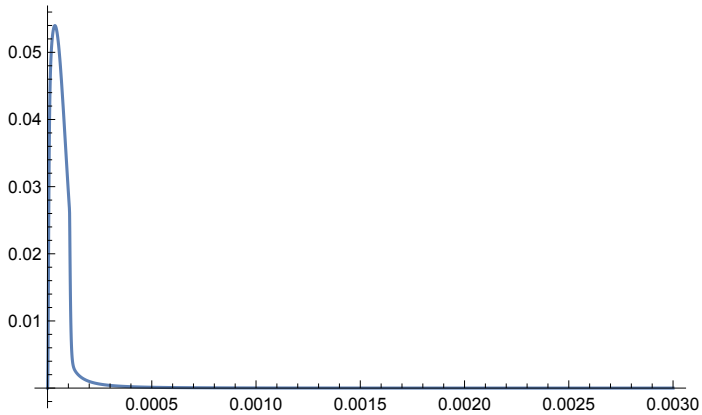
Out[1573]=



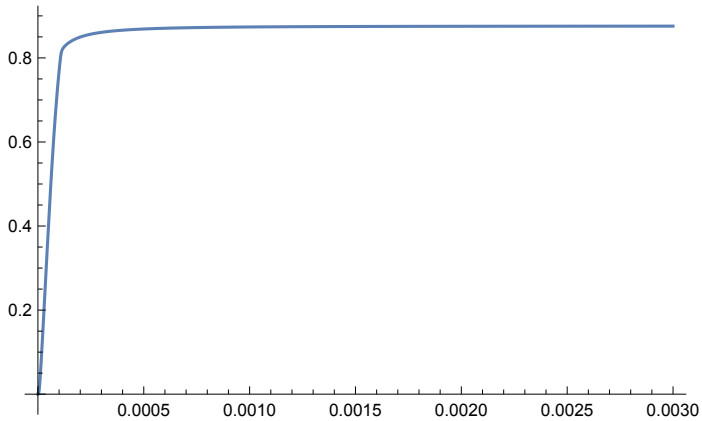
Out[1574]=



Out[1575]=



Out[1576]=



different caRest

In[1577]:=
```
caRestLow = 30*^-9;
caRestHigh = 180*^-9;
```

Low Ca

Initial occupancy

In[1579]:=
```
(*calualte initial equilibrium occupancy*)
caFunc[t_] := caRestLow;
kprimScheme
kunprimScheme
ss0Initial = kprimScheme / kunprimScheme
```

Out[1580]= 1.04335

Out[1581]= 3.65793

Out[1582]= 0.28523

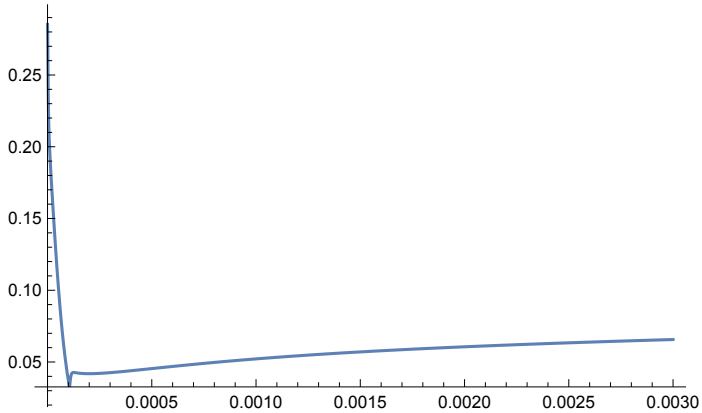
Diff eq.

In[1583]:=
```
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}};
```

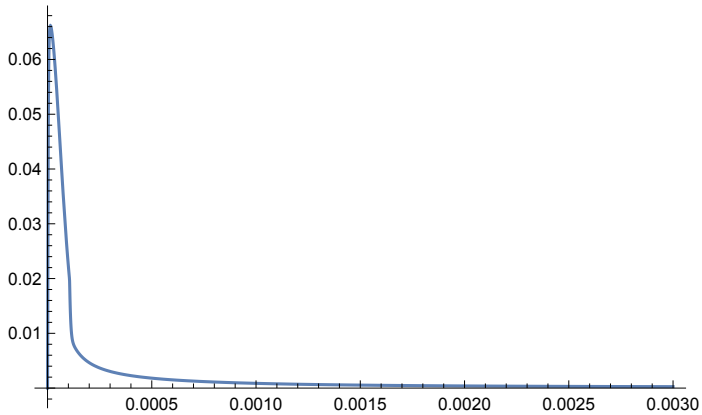
NDSolve

In[1587]:=
```
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]
```

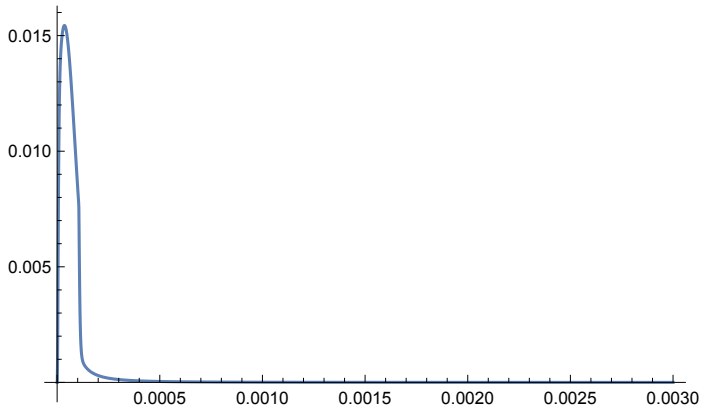
Out[1588]=



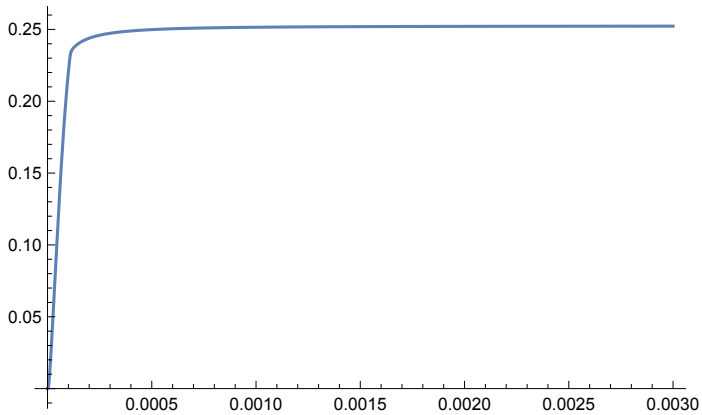
Out[1589]=



Out[1590]=



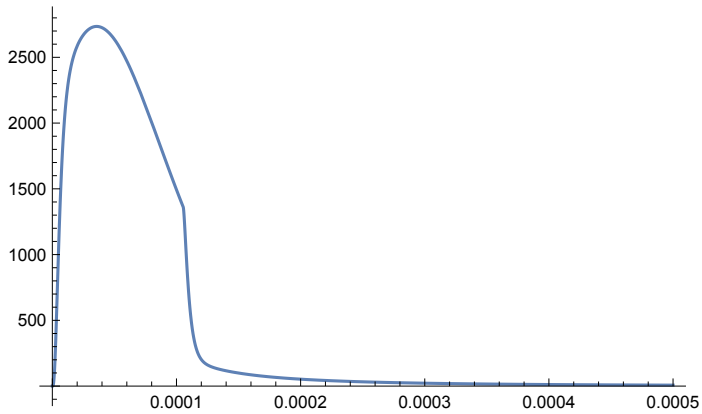
Out[1591]=



Plot EPSC

In[1592]:=
```
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[1594]=



High Ca

Initial occupancy

In[1595]:=
```
(*calualte initial equilibrium occupancy*)
caFunc[t_] := caRestHigh;
kprimScheme
kunprimScheme
ss0Initial = kprimScheme / kunprimScheme
```

Out[1596]= 3.07706

Out[1597]= 3.65793

Out[1598]= 0.841205

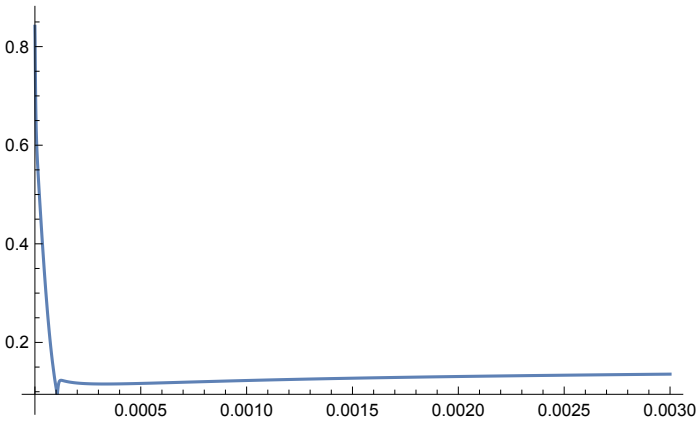
Diff eq.

In[1599]:=
```
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}};
```

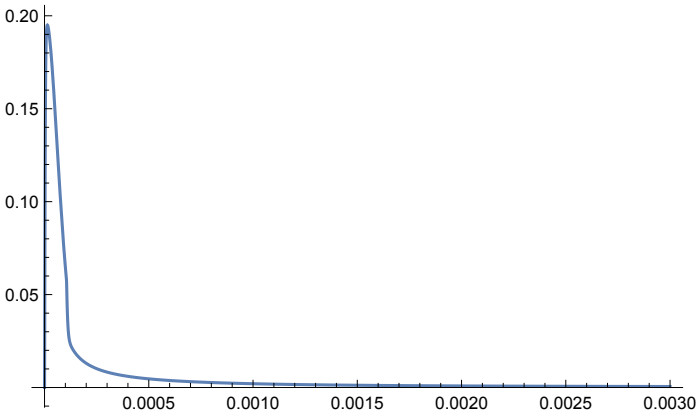
NDSolve

In[1603]:=
```
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]
```

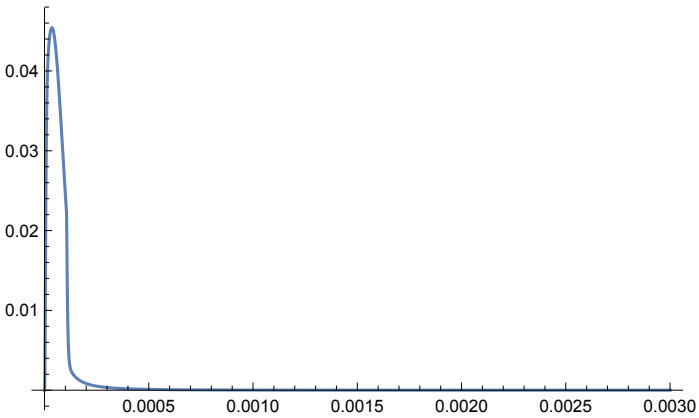
Out[1604]=



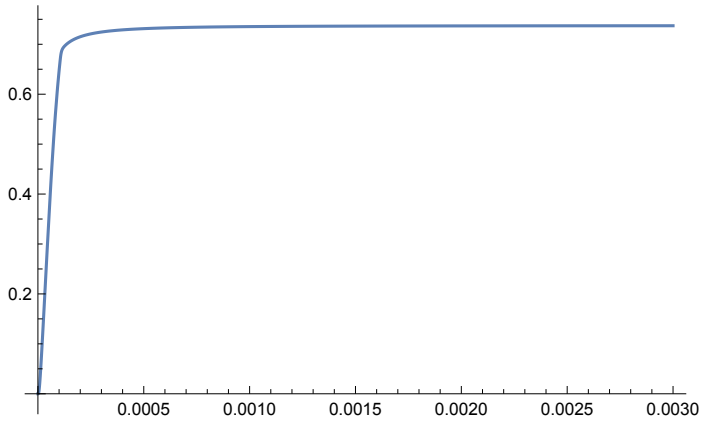
Out[1605]=



Out[1606]=



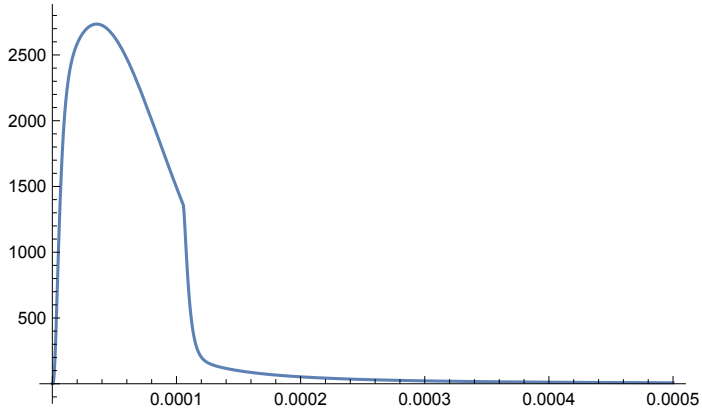
Out[1607]=



Plot EPSC

In[1608]:=
```
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[1610]=

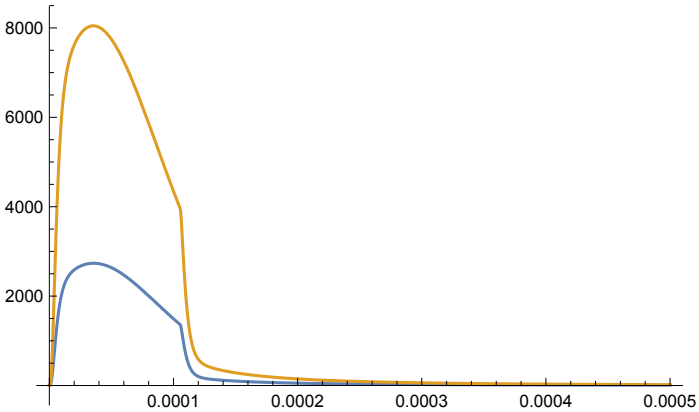


Compare

Plot both release rates

In[1611]:=
```
Plot[{epscLowCa, epscHighCa}, {t, 0, 0.5*^-3}, PlotRange → All]
```

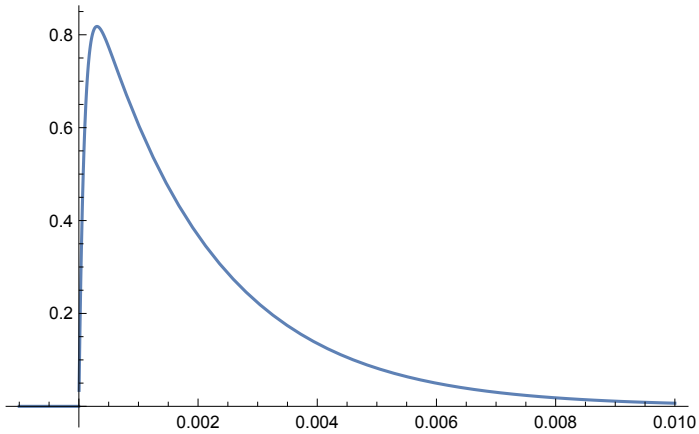
Out[1611]=



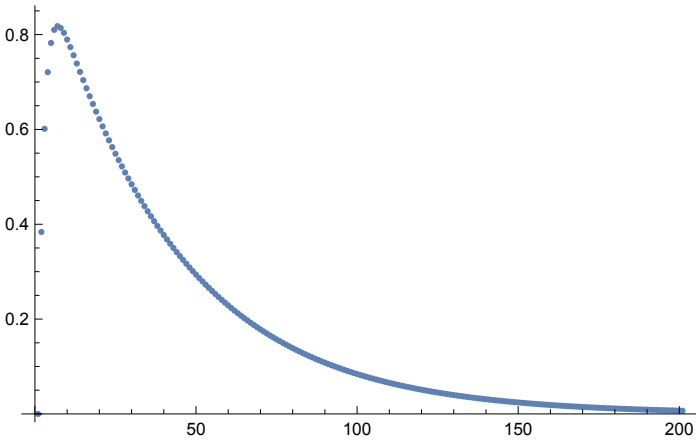
Convolution RelRate => EPSC

In[1612]:=
```
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]
```

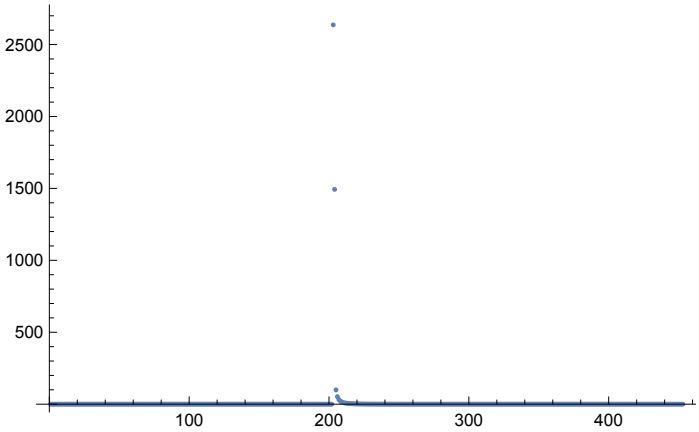
Out[1613]=



Out[1618]=

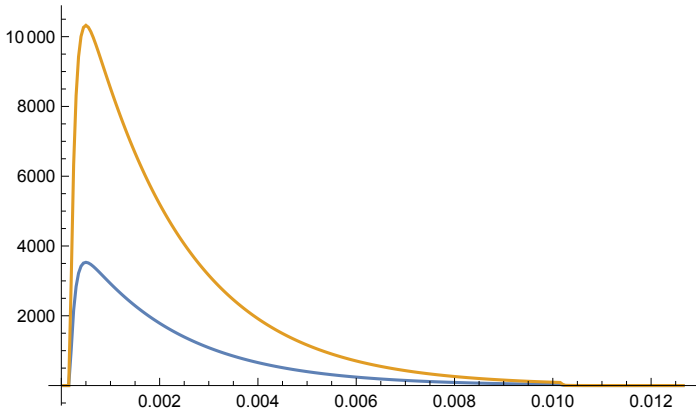


Out[1619]=

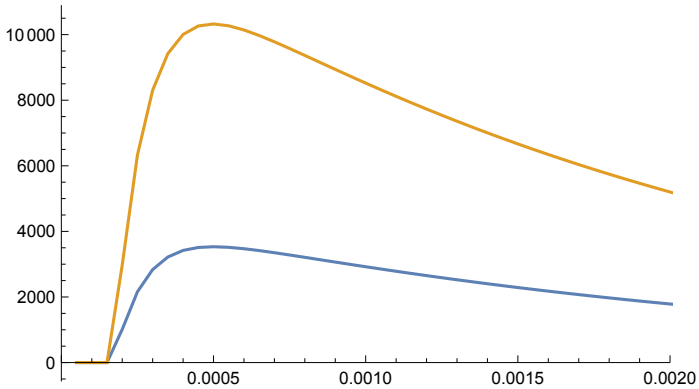


In[1620]:=
```
epscLowCaCurrentList = ListConvolve[miniKernelList, epscLowCaList];
epscHighCaCurrentList = ListConvolve[miniKernelList, epscHighCaList];
timeConv = Table[t * dtForConvolve, {t, Length[epscLowCaCurrentList]}];
ListPlot[{Transpose[{timeConv, epscLowCaCurrentList}],
  Transpose[{timeConv, 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[1623]=



Out[1624]=

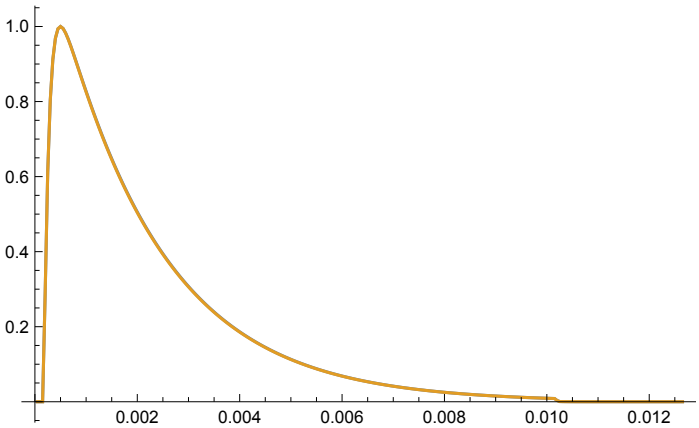


Out[1625]= 3532.14

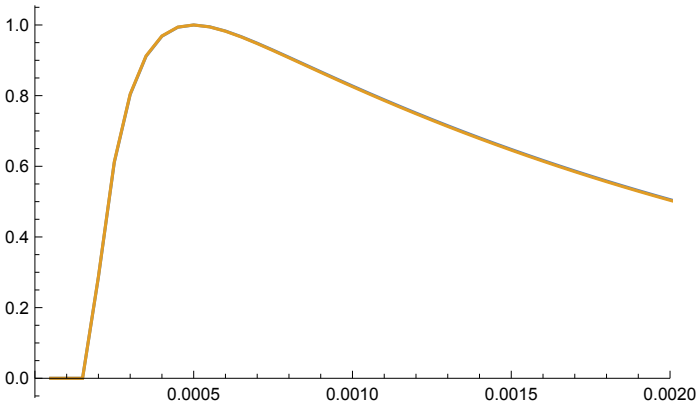
Out[1626]= 10 325.2

maxHigh/maxLow = 2.92322

Out[1628]=



Out[1629]=



Timing

In[1631]:=
```
timeEnd = AbsoluteTime[];
(timeEnd - timeStart) / 60. (* time of calculation in min *)
```

Out[1632]=
```
76.9409
```