```
patnum = {12, 29, 31, 200, 453, 2031, 20310, 4531, 4532, 4535};
PAN = 6;
filenum = {3, 3, 3, 3, 3, 3, 3, 3, 3, 3};
(*parameters for each experiment*)

T = {};
visc = {};
fr = {};
calib = {};
zpliku = {};
(*variables*)
denshisttot = {};
daneXYtot = {};
driftXtot = {};
driftYtot = {};
driftfittot = {};
inclentot = {};
MSDtot = {};
fittot = {};
logfittot = {};
linfittot = {};
lintrunctot = {};
alphastot = {};
diffconst1tot = {};
diffconst2tot = {};
diffconst3tot = {};
diameterstot = {};
diamlintot = {};
diamtrunclintot = {};
stddiamtot = {};
For[it = 1, it ≤ Length[patnum], ++it,
 (*setting parameters*)
 summary = Import[NotebookDirectory[] <> "NTA_WARSZAWA/" <> ToString[patnum[[it]]] <>
    "/" <> ToString[patnum[[it]]] <> "_1-2-BATCH-summary.csv"];
 AppendTo[T, Take[summary[[If[it < PAN, 58, 17]]] + 273, {2, 1 + filenum[[it]]}]];
 AppendTo[visc, Take[summary[[If[it < PAN, 59, 18]]], {2, 1 + filenum[[it]]}]];
 AppendTo[fr, Take[summary[[If[it < PAN, 57, 27]]], {2, 1 + filenum[[it]]}]];
 AppendTo[calib,
  If[it < PAN, Take[summary[[20]], {2, 1 + filenum[[it]]}], Table[142, {filenum[[it]]}]]];

 daneraw = {Import[NotebookDirectory[] <> "NTA_WARSZAWA/" <> ToString[patnum[[it]]] <>
     "/" <> ToString[patnum[[it]]] <> "_1-001-alltracks.csv"]};
 For[it2 = 2, it2 ≤ filenum[[it]], ++it2,
  AppendTo[daneraw,
    Drop[Import[NotebookDirectory[] <> "NTA_WARSZAWA/" <> ToString[patnum[[it]]] <> "/" <>
       ToString[patnum[[it]]] <> "_" <> ToString[it2] <> "-001-alltracks.csv"], 1]];];
 daneraw = Flatten[daneraw, 1];
 daneraw = Select[daneraw, #[[8]] == "True" &];
 (*ile=0;
 For[i=2,i<Length[daneraw],++i,If[daneraw[[i,1]]≠daneraw[[i+1,1]],++ile, ]];*)
```

```
dane = {};
tmp = {{daneraw[[2, 4]], daneraw[[2, 5]], daneraw[[2, 6]]}};
tmpstddiam = {};
For[i = 2, i < Length[daneraw], ++i,
 If[daneraw[[i, 1]] == daneraw[[i + 1, 1]] && i ≠ (Length[daneraw] - 1),
  AppendTo[tmp, {daneraw[[i + 1, 4]], daneraw[[i + 1, 5]], daneraw[[i + 1, 6]]} ],
  AppendTo[dane, tmp];
  tmp = {{daneraw[[i + 1, 4]], daneraw[[i + 1, 5]], daneraw[[i + 1, 6]]}};
  If[daneraw[[i, 8]] == "True", AppendTo[tmpstddiam, daneraw[[i, 2]]];]]
];
AppendTo[stddiamtot, tmpstddiam];
tmpdaneXY = {};
tmp = {{daneraw[[2, 5]], daneraw[[2, 6]]}};
For[i = 2, i < Length[daneraw], ++i,
 If[daneraw[[i, 1]] == daneraw[[i + 1, 1]] && i ≠ (Length[daneraw] - 1),
  AppendTo[tmp, {daneraw[[i + 1, 5]], daneraw[[i + 1, 6]]} ],
  AppendTo[tmpdaneXY, tmp];
  tmp = {{daneraw[[i + 1, 5]], daneraw[[i + 1, 6]]}};]
];
Print["calkowita liczba trajektorii: ", Length[tmpdaneXY]];

daneXY = Select[tmpdaneXY, Length[#] > 2 &];
(*AppendTo[daneXYtot,daneXY];*)
(*drift analysis*)
driftX = ParallelTable[{n, 1.0 / (Length[daneXY[[j]]] - n) *
     Sum[(daneXY[[j, i + n, 1]] - daneXY[[j, i, 1]]), {i, 1, Length[daneXY[[j]]] - n}]},
  {j, 1, Length[daneXY]}, {n, 0, Length[daneXY[[j]]] - 1}];
driftY = ParallelTable[{n, 1.0 / (Length[daneXY[[j]]] - n) *
     Sum[(daneXY[[j, i + n, 2]] - daneXY[[j, i, 2]]), {i, 1, Length[daneXY[[j]]] - n}]},
  {j, 1, Length[daneXY]}, {n, 0, Length[daneXY[[j]]] - 1}];

(*altdriftX=ParallelTable[]*)

(*GraphicsGrid[{{ListPlot[Select[driftX,Length[#]>10&],
     Joined→True,PlotRange→All,AxesLabel→{"n","<Δx_n>"}],
    ListPlot[Select[driftY,Length[#]>10&],
     Joined→True,PlotRange→All,AxesLabel→{"n","<Δy_n>"}]}}]*)

(*MSD - calculates mean square displacement inceremente*)
MSD = ParallelTable[{n, 1 / (Length[daneXY[[j]]] - n) *
     Sum[(daneXY[[j, i + n, 1]] - daneXY[[j, i, 1]] - driftX[[j, n, 2]]) ^2 +
       (daneXY[[j, i + n, 2]] - daneXY[[j, i, 2]] - driftY[[j, n, 2]]) ^2,
      {i, 1, Length[daneXY[[j]]] - n}]},
  {j, 1, Length[daneXY]}, {n, 1, Length[daneXY[[j]]] - 1}];
(*AppendTo[MSDtot,MSD];*)
(*normXY=
 Table[{Sum[1/Length[daneXY[[j]]]*(daneXY[[j,i+1,1]]-daneXY[[j,i,1]]-driftX[[j,2,2]])^2,
    {i,1,Length[daneXY[[j]]]-1}],
   Sum[1/Length[daneXY[[j]]]*(daneXY[[j,i+1,2]]-daneXY[[j,i,2]]-driftY[[j,2,2]])^2,
    {i,1,Length[daneXY[[j]]]-1}]},{j,1,Length[daneXY]}];
```

```
corX=Table[{n,1/(Length[daneXY[[j]]]-n)/normXY[[j,1]]*
    Sum[(daneXY[[j,i+1,1]]-daneXY[[j,i,1]]-driftX[[j,2,2]])*(daneXY[[j,i+1+n,1]]-
        daneXY[[j,i+n,1]]-driftX[[j,2,2]]),{i,1,Length[daneXY[[j]]]-n-1}]},
  {j,1,Length[daneXY]},{n,0,Length[daneXY[[j]]]-1}];
corY=Table[{n,1/(Length[daneXY[[j]]]-n)/normXY[[j,2]]*Sum[
     (daneXY[[j,i+1,2]]-daneXY[[j,i,2]]-driftY[[j,2,2]])*
      (daneXY[[j,i+1+n,2]]-daneXY[[j,i+n,2]]-driftY[[j,2,2]])
     ,{i,1,Length[daneXY[[j]]]-n-1}]},
  {j,1,Length[daneXY]},{n,0,Length[daneXY[[j]]]-1}];
(*ListPlot[{(*corR[[8]],*)corX[[8]],corY[[8]]},Joined→True,Mesh→All,PlotRange→All]*)
meanVxy=Table[1/(Length[daneXY[[j]]])
   Sum[daneXY[[j,i+1]]-daneXY[[j,i]],{i,1,Length[daneXY[[j]]]-1}],{j,1,Length[daneXY]}];
incrX=Table[daneXY[[i,j+1,1]]-daneXY[[i,j,1]]-driftX[[i,2,2]],
  {i,1,Length[daneXY]},{j,1,Length[daneXY[[i]]]-1}];
incrY=Table[daneXY[[i,j+1,2]]-daneXY[[i,j,2]]-driftY[[i,2,2]],
  {i,1,Length[daneXY]},{j,1,Length[daneXY[[i]]]-1}]; *)

(*In this block file numration is set*)
AppendTo[zpliku, Flatten[Table[it2, {it2, 1, filenum[[it]]},
   {i, 1, Length[Select[Drop[Import[NotebookDirectory[] <> "NTA_WARSZAWA/" <>
         ToString[patnum[[it]]] <> "/" <> ToString[patnum[[it]]] <> "_" <> ToString[it2] <>
         "-001-intensity.csv"], 1], #[[6]] > 2 && #[[7]] == "True" &]]}], 1]];
Print["test śledzenia numeracji:", Length[zpliku[[it]]]];


(*Calculates density histograms for each experiment*)
AppendTo[denshisttot, {}];
For[it2 = 1, it2 ≤ filenum[[it]], ++it2,
 sortedtmp = Sort[Select[
    Drop[Import[NotebookDirectory[] <> "NTA_WARSZAWA/" <> ToString[patnum[[it]]] <>
       "/" <> ToString[patnum[[it]]] <> "_" <> ToString[it2] <> "-001-alltracks.csv"],
     1], #[[8]] == "True" &], #1[[4]] < #2[[4]] &];
 sortedXYtmp = Flatten[Table[
    Take[Select[sortedtmp, #[[4]] == i &], All, {5, 6}], {i, 0, Last[sortedtmp][[4]]}], 1];
 AppendTo[denshisttot[[it]], HistogramDistribution[sortedXYtmp, {25}]];
];


(*function analysing the length of accepted trajectories*)
inctest[msd_] :=
 Module[{dat = msd, n = 1}, While[((dat[[n + 1, 2]] ≥ dat[[n, 2]]) || If[Length[dat] - n ≥ 3,
       ((dat[[n + 2, 2]] ≥ dat[[n, 2]]) && (n ≥ 3)), False]) && (n < Length[dat]), ++n];
  Return[n]];
inclen = Table[inctest[MSD[[i]]], {i, 1, Length[MSD]}];
lev = 3;
levMSD =
 Select[Table[Take[MSD[[i]], inclen[[i]]], {i, 1, Length[MSD]}], Length[#] ≥ lev &];
incposlist = Select[Table[If[inclen[[i]] ≥ lev, i, 0], {i, 1, Length[inclen]}], # ≠ 0 &];
AppendTo[inclentot, Select[inclen, # ≥ lev &]];
AppendTo[MSDtot, MSD[[incposlist]]];
```

```
AppendTo[daneXYtot, daneXY[[incposlist]]];
AppendTo[driftXtot, driftX[[incposlist]]];
AppendTo[driftYtot, driftY[[incposlist]]];
zpliku[[it]] = zpliku[[it, incposlist]];

(*fitting various test models for MSD*)
Print["próbka nr. ", patnum[[it]]];
Print["l. trajektorii: ", Length[levMSD]];
MSDforlin = MSD[[incposlist]];
linfit = Quiet[ParallelTable[NonlinearModelFit[MSDforlin[[i]], {a * x}, {{a, 500.0}},
    x, MaxIterations → 200, AccuracyGoal → 3], {i, 1, Length[MSDforlin]}]];
lintruncfit =
 Quiet[ParallelTable[NonlinearModelFit[levMSD[[i]], {a * x + b^2}, {{a, 500.0}, {b, 1.0}},
    x, MaxIterations → 500, AccuracyGoal → 3], {i, 1, Length[levMSD]}]];
AppendTo[linfittot, linfit];
AppendTo[lintrunctot, lintruncfit];

fit = Quiet[ParallelTable[NonlinearModelFit[Take[levMSD[[i]],
     (*If[Length[levMSD[[i]]>10,10,Length[levMSD[[i]] ]*)Length[levMSD[[i]] ],
    {a * x^α + b^2, a > 0, 2 > α > 0}, {{a, 500.0}, {α, 0.1}, {b, 0.001}}, x,
    MaxIterations → 500, AccuracyGoal → 3], {i, 1, Length[levMSD]}]];
AppendTo[fittot, fit];
alphas = Table[Abs[fit[[i]]["BestFitParameters"][[2, 2]]], {i, 1, Length[fit]}];
AppendTo[alphastot, alphas];
diffconst1 = Table[fit[[i]]["BestFitParameters"][[1, 2]], {i, 1, Length[fit]}];
AppendTo[diffconst1tot, diffconst1];

logfit = Quiet[ParallelTable[NonlinearModelFit[
    Take[levMSD[[i]], (*If[Length[levMSD[[i]]>10,10,Length[levMSD[[i]] ]*)
     Length[levMSD[[i]] ], {(*Abs[a]/Abs[d]*Log[1+Abs[d]*x]+b^2*)
     a / d * Log[1 + d * x] + b^2, a > 0, d > 0.0001}, {{a, 50.0}, {d, 0.01}, {b, 0.01}},
    x, MaxIterations → 500, AccuracyGoal → 3], {i, 1, Length[levMSD]}]];
AppendTo[logfittot, logfit];
diffconst2 = Table[logfit[[i]]["BestFitParameters"][[1, 2]], {i, 1, Length[logfit]}];
AppendTo[diffconst2tot, diffconst2];
diffconst3 = Table[logfit[[i]]["BestFitParameters"][[2, 2]], {i, 1, Length[logfit]}];
AppendTo[diffconst3tot, diffconst3];
diameters = Table[2 * 4 * T[[it, zpliku[[it, i]]]] * 1.38 *
   10^(-23) / (6 * π * (diffconst2[[i]] * (calib[[it, zpliku[[it, i]]]])^2 *
         10^(-18) * fr[[it, zpliku[[it, i]]]]) *
      visc[[it, zpliku[[it, i]]]] * 0.001) * 10^9, {i, 1, Length[diffconst2]}];
diamlin = Table[2 * 4 * T[[it, zpliku[[it, i]]]] *
   1.38 * 10^(-23) / (6 * π * (linfit[[i]]["BestFitParameters"][[1, 2]] *
         (calib[[it, zpliku[[it, i]]]])^2 * 10^(-18) * fr[[it, zpliku[[it, i]]]]) *
      visc[[it, zpliku[[it, i]]]] * 0.001) * 10^9, {i, Length[linfit]}];
diamtrunclin = Table[2 * 4 * T[[it, zpliku[[it, i]]]] * 1.38 *
   10^(-23) / (6 * π * (lintruncfit[[i]]["BestFitParameters"][[1, 2]] *
         (calib[[it, zpliku[[it, i]]]])^2 * 10^(-18) * fr[[it, zpliku[[it, i]]]]) *
      visc[[it, zpliku[[it, i]]]] * 0.001) * 10^9, {i, Length[linfit]}];
```

```
 AppendTo[diameterstot, diameters];
 AppendTo[diamlintot, diamlin];
 AppendTo[diamtrunclintot, diamtrunclin];

 (*Fitting drifts*)
 driftinclen = Select[inclen, # ≥ lev &];
 driftfit =
  Quiet[{ParallelTable[NonlinearModelFit[Take[driftXtot[[it, i]], driftinclen[[i]]],
      {v * t^Abs[a]}, {{v, driftXtot[[it, i, lev, 2]]}, {a, 0.7}}, t,
      AccuracyGoal → 3, MaxIterations → 500], {i, 1, Length[driftXtot[[it]]]}],
    ParallelTable[NonlinearModelFit[Take[driftYtot[[it, i]], driftinclen[[i]]],
      {v * t^Abs[a]}, {{v, driftYtot[[it, i, lev, 2]]}, {a, 0.7}}, t,
      AccuracyGoal → 3, MaxIterations → 500], {i, 1, Length[driftYtot[[it]]]}]}];
 AppendTo[driftfittot, driftfit];

 (*histograms*)
 Print[GraphicsGrid[
   {
    {Histogram[alphas, {0.1}, AxesLabel → {"α", ""}],
     Histogram[Select[diameters, # < 1000 &], {25}, AxesLabel → {"d", ""},
      PlotLabel → "Log. fit"], Histogram[Select[diamlin, # < 1000 &],
      {25}, AxesLabel → {"d", ""}, PlotLabel → "lin. fit, full lenght"],
     Histogram[Select[diamtrunclin, # < 1000 &], {25},
      AxesLabel → {"d", ""}, PlotLabel → "lin. fit, truncated"]},
    {
     Histogram[Table[fittot[[it, i]]["BestFitParameters"][[3, 2]]^2,
       {i, 1, Length[fittot[[it]]]}], AxesLabel → {"b"}, PlotLabel → "free param."],
     Histogram[Abs[Flatten[Table[{driftfittot[[it, 1, i]]["BestFitParameters"][[2, 2]],
          driftfittot[[it, 2, i]]["BestFitParameters"][[2, 2]]},
         {i, 1, Length[driftfittot[[it, 1]]]} ]]], {0.1}, AxesLabel → {"a", ""},
      PlotLabel → "drift linearity", PlotRange → {{0, 3}, All}],
     Histogram[{Table[driftfittot[[it, 1, i]]["BestFitParameters"][[1, 2]],
        {i, 1, Length[driftfittot[[it, 1]]]}],
       Table[driftfittot[[it, 2, i]]["BestFitParameters"][[1, 2]],
        {i, 1, Length[driftfittot[[it, 2]]]}]}, {0.1}, PlotLabel → "velocities"]
     (*,Manipulate[Show[Plot[{fit[[n]][x],logfit[[n]][x]},{x,0,10},
        Epilog→Inset[{fit[[n]]["BestFitParameters"],logfit[[n]]["BestFitParameters"]},
          Scaled[{0.5,0.5}]]],ListPlot[levMSD[[n]]],{n,1,Length[levMSD],1}]*)
     , }
    }, ImageSize → {1200, 300}]];
]
(*data export*)
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/T.dat", Compress[T]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/visc.dat", Compress[visc]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/fr.dat", Compress[fr]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/calib.dat", Compress[calib]];
Export[
  NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/zpliku.dat", Compress[zpliku]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/denshisttot.dat",
  Compress[denshisttot]];
```

```
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/daneXYtot.dat",
  Compress[daneXYtot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftXtot.dat",
  Compress[driftXtot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftYtot.dat",
  Compress[driftYtot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfittot.dat",
  Compress[driftfittot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/inclentot.dat",
  Compress[inclentot]];
Export[
  NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/MSDtot.dat", Compress[MSDtot]];
Export[
  NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/fittot.dat", Compress[fittot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/logfittot.dat",
  Compress[logfittot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/linfittot.dat",
  Compress[linfittot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/lintrunctot.dat",
  Compress[lintrunctot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/alphastot.dat",
  Compress[alphastot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diffconst1tot.dat",
  Compress[diffconst1tot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diffconst2tot.dat",
  Compress[diffconst2tot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diffconst3tot.dat",
  Compress[diffconst3tot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diameterstot.dat",
  Compress[diameterstot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diamlintottot.dat",
  Compress[diamlintot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diamtrunclintot.dat",
  Compress[diamtrunclintot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/stddiamtot.dat",
  Compress[stddiamtot]];
(************* most important variables ******************
   daneXY[[i,j,k]] : succesive positions of a variable
       i - particle number
       j - i-th particle position in j-th moment (a pair {x,y})
       k - coordinates (1 to x, 2 to y)
   driftX[[i,j]] : returns a pair {j,<Δx_n>}, where <Δx_n> = 1/(N-n) Σ_{i=1}^{N-n} (x_{i+n}-x_i)
        i - particle number
        j - drift at j-th moment
        k - results (k=1 returns j, k=2 returns mean velocity)
    MSD[[i,j]] : returns a pair {j,MSD(j)},
where MSD(n) = 1/(N-n) ( Σ_{i=1}^{N-n} (x_{i+n}-x_i-<Δx_n>)^2 + (the same for y) )
        i - particle number
        j - moment
```

corX[[i,j]] : i – particle number,
returns pair {j,$C_x(j)$} where $C_x(j)$ is the correlation of velocities.
Let $v_{x,n}=x_{n+1}-x_n-\langle\Delta x_1\rangle$
be the velocity at moment n after removing the drift. Then $C_x(n)=\frac{1}{N-n}\sum_{i=1}^{N-n} v_{x,i+n}v_{x,i}$

**********)

In[ ]:=
```
(*code for uploading results if they were calculated before*)
patnum = {12, 29, 31, 200, 453, 2031, 20310, 4531, 4532, 4535};
filenum = {3, 3, 3, 3, 3, 3, 3, 3, 3, 3};
T = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/T.dat", "String"]];
visc = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/visc.dat", "String"]];
fr = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/fr.dat", "String"]];
calib = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/calib.dat", "String"]];
zpliku = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/zpliku.dat", "String"]];
denshisttot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/denshisttot.dat", "String"]];
daneXYtot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/daneXYtot.dat", "String"]];
driftXtot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftXtot.dat", "String"]];
driftYtot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftYtot.dat", "String"]];
inclentot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/inclentot.dat", "String"]];
MSDtot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/MSDtot.dat", "String"]];
fittot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/fittot.dat", "String"]];
logfittot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/logfittot.dat", "String"]];
linfittot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/linfittot.dat", "String"]];
lintrunctot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/lintrunctot.dat", "String"]];
alphastot = Uncompress[
   Import[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/alphastot.dat", "String"]];
diffconst1tot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diffconst1tot.dat", "String"]];
diffconst2tot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diffconst2tot.dat", "String"]];
diffconst3tot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diffconst3tot.dat", "String"]];
diameterstot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diameterstot.dat", "String"]];
```

```
diamlintot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diamlintottot.dat", "String"]];
diamtrunclintot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/diamtrunclintot.dat", "String"]];
stddiamtot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/stddiamtot.dat", "String"]];
(*driftfittot has high-memory demand,
instead load driftfitvelXtot and driftfitvelYtot (just parameters) ,
if calculated already*)
driftfittot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfittot.dat", "String"]];
driftfitvelXtot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfitvelXtot.dat", "String"]];
driftfitvelYtot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfitvelYtot.dat", "String"]];
```

In[ ]:=

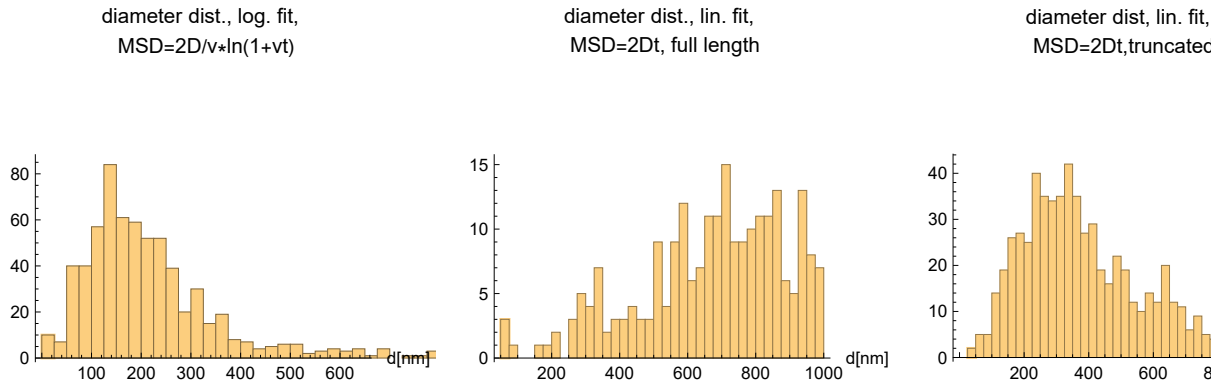
```
(*extracts parameters from driftfittot and writes them to files*)
driftfittot = Uncompress[Import[
    NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfittot.dat", "String"]];
driftfitvelXtot = {};
driftfitvelYtot = {};
For[it = 1, it ≤ Length[driftfittot], ++it,
 AppendTo[driftfitvelXtot,
  ParallelTable[driftfittot[[it, 1, i]]["BestFitParameters"][[1, 2]],
   {i, 1, Length[driftfittot[[it, 1]]]}]];
 AppendTo[driftfitvelYtot,
  ParallelTable[driftfittot[[it, 2, i]]["BestFitParameters"][[1, 2]],
   {i, 1, Length[driftfittot[[it, 2]]]}]];
 Print["it=", it];]
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfitvelXtot.dat",
  Compress[driftfitvelXtot]];
Export[NotebookDirectory[] <> "NTA_WARSZAWA/results_tmp/driftfitvelYtot.dat",
  Compress[driftfitvelYtot]];
```

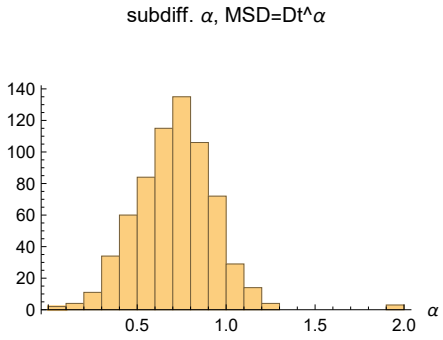
In[ ]:=

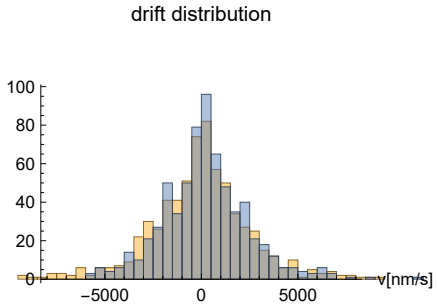
```
driftXnm = ParallelTable[
   calib[[it, zpliku[[it, i]]]] * fr[[it, zpliku[[it, i]]]] * driftfitvelXtot[[it, i]],
   {it, 1, Length[driftfitvelXtot]}, {i, 1, Length[driftfitvelXtot[[it]]]}];
driftYnm = ParallelTable[
   calib[[it, zpliku[[it, i]]]] * fr[[it, zpliku[[it, i]]]] * driftfitvelYtot[[it, i]],
   {it, 1, Length[driftfitvelXtot]}, {i, 1, Length[driftfitvelYtot[[it]]]}];
```

In[ ]:=
```
imgsize = {200, 200};
For[it = 1, it ≤ Length[daneXYtot], ++it,
 Print["Sample num.:", patnum[[it]],
  ", number of trajectories:", Length[daneXYtot[[it]]]];
 Print[GraphicsGrid[{
    {Histogram[Select[diameterstot[[it]], # < 1000 &],
      {25}, AxesLabel → {"d[nm]", ""}, PlotLabel →
       "diameter dist., log. fit, \n MSD=2D/v*ln(1+vt)", ImageSize → imgsize],
     Histogram[Select[diamlintot[[it]], # < 1000 &],
      {25}, AxesLabel → {"d[nm]", ""}, PlotLabel →
       "diameter dist., lin. fit, \n MSD=2Dt, full length", ImageSize → imgsize],
     Histogram[Select[diamtrunclintot[[it]], # < 1000 &], {25}, AxesLabel → {"d[nm]", ""},
      PlotLabel → "diameter dist, lin. fit, \n MSD=2Dt,truncated", PlotRange →
       {{0, Automatic}, Automatic}, ImageSize → imgsize]}}, ImageSize → {700, 250}]];
 Print[GraphicsGrid[{
    {Histogram[alphastot[[it]], {0.1}, AxesLabel → {"α", ""},
      PlotLabel → "subdiff. α, MSD=Dt^α", ImageSize → imgsize], (*Histogram[
      Abs[Flatten[ParallelTable[{driftfittot[[it,1,i]]["BestFitParameters"][[2,2]],
          driftfittot[[it,2,i]]["BestFitParameters"][[2,2]]},
         {i,1,Length[driftfittot[[it,1]]]} ]]],{0.1},AxesLabel→{"a",""},
      PlotLabel→"drift linearity",PlotRange→{{0,3},All}],*)
     Histogram[{driftXnm[[it]], driftYnm[[it]]}, {500}, AxesLabel → {"v[nm/s]"},
      PlotLabel → "drift distribution", ImageSize → imgsize]}
   }, ImageSize → {600, 250}]];
]
```

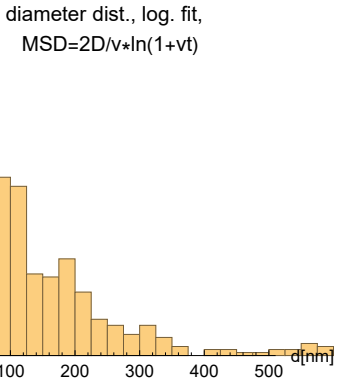
```
Sample num.:12, number of trajectories:673
```

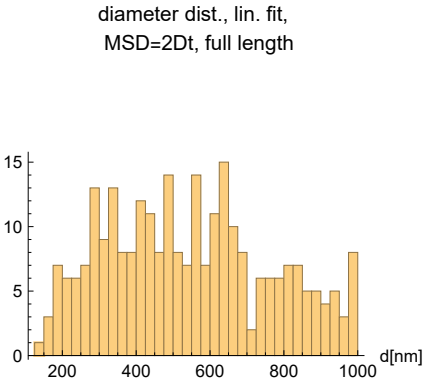


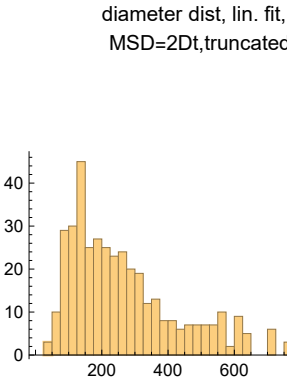


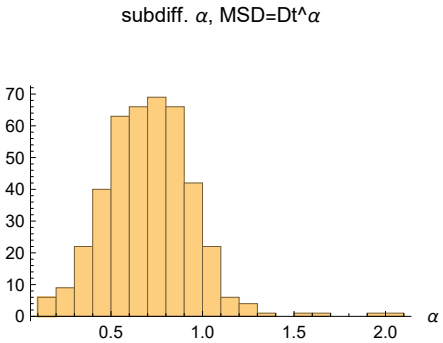


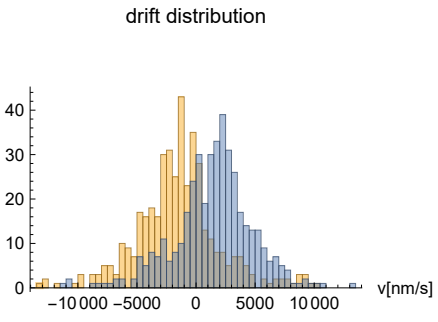

```
Sample num.:29, number of trajectories:420
```





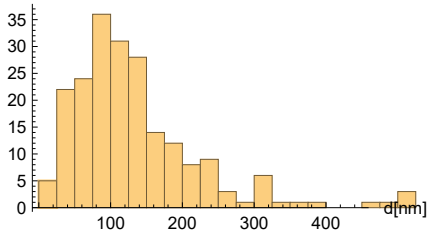




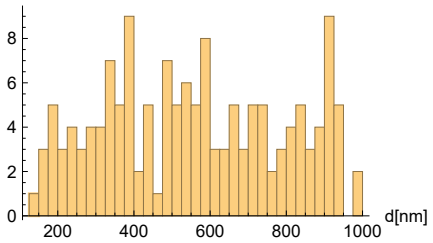



```
Sample num.:31, number of trajectories:212
```

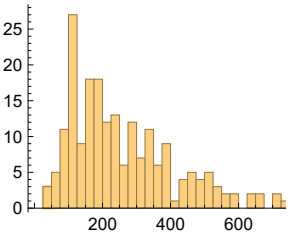
diameter dist., log. fit,
MSD=2D/v*ln(1+vt)



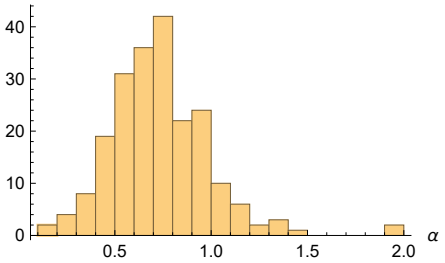
diameter dist., lin. fit,
MSD=2Dt, full length



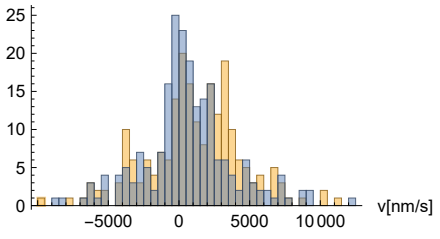
diameter dist, lin. fit,
MSD=2Dt,truncatec



subdiff. α, MSD=Dt^α

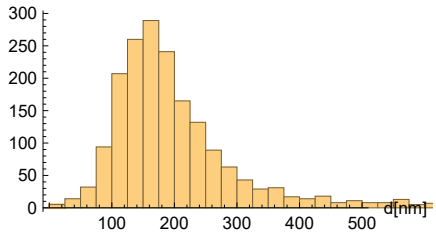


drift distribution

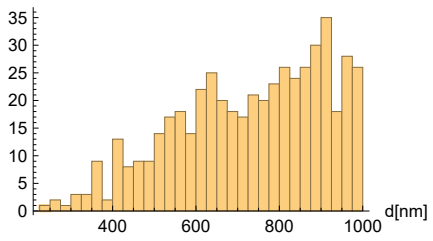



```
Sample num.:200, number of trajectories:1872
```

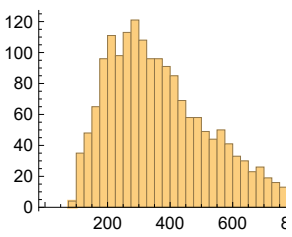
diameter dist., log. fit,
MSD=2D/v*ln(1+vt)

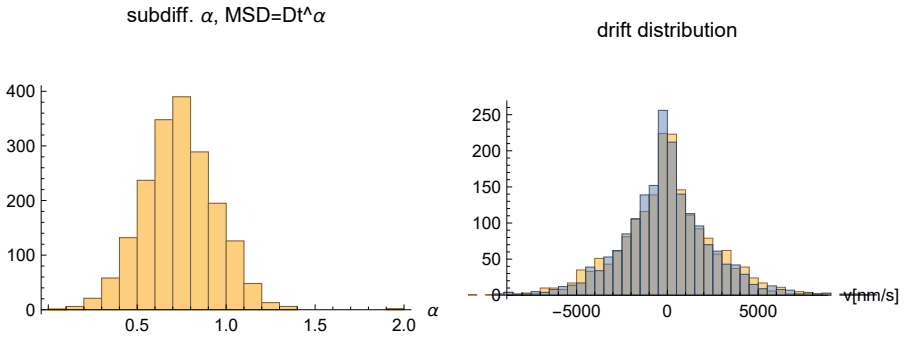


diameter dist., lin. fit,
MSD=2Dt, full length

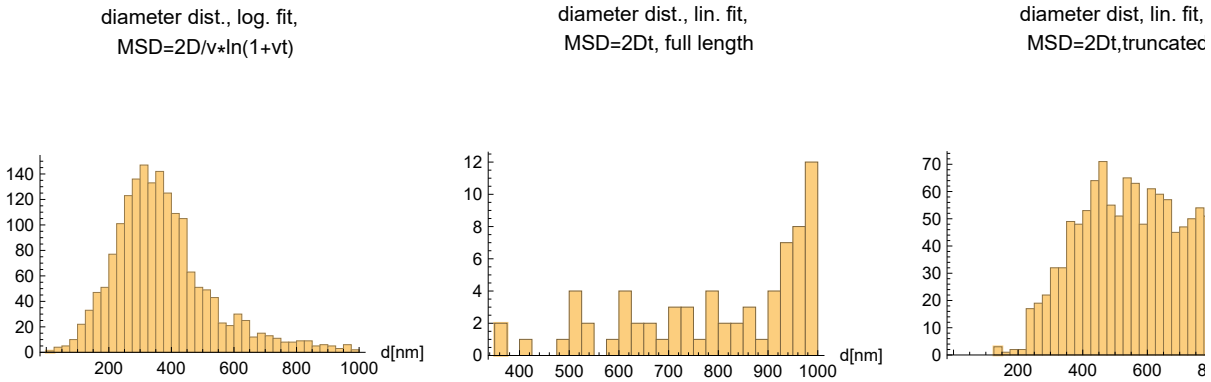


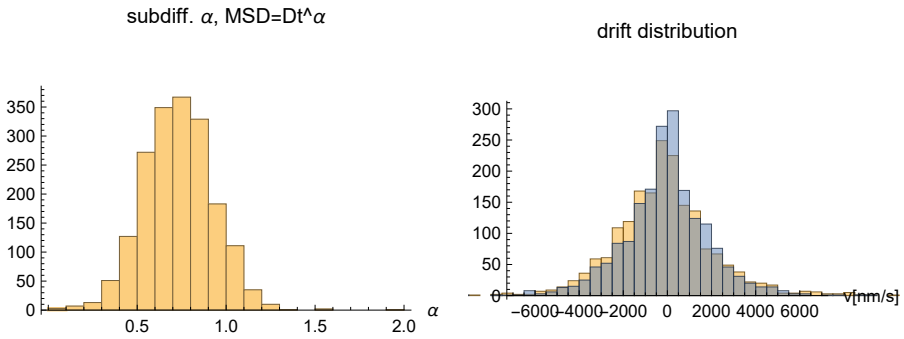
diameter dist, lin. fit
MSD=2Dt,truncate






```
Sample num.:453, number of trajectories:1861
```

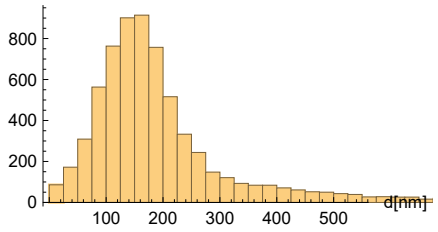




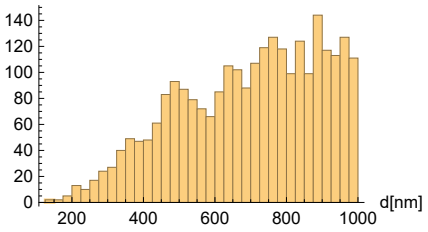

```
Sample num.:2031, number of trajectories:6807
```

Less: Invalid comparison with ComplexInfinity attempted.

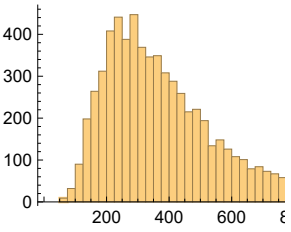
diameter dist., log. fit,
MSD=2D/v*ln(1+vt)



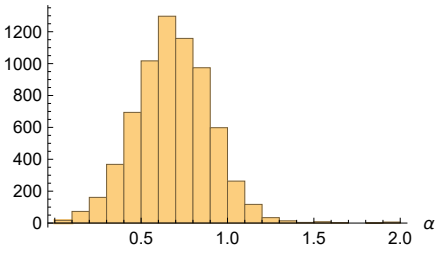
diameter dist., lin. fit,
MSD=2Dt, full length



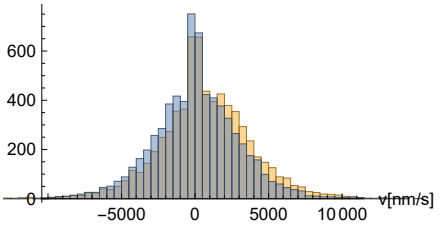
diameter dist, lin. fit
MSD=2Dt,truncate



subdiff. α, MSD=Dt^α

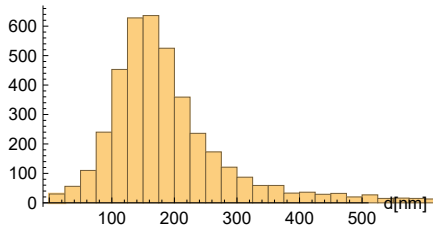


drift distribution

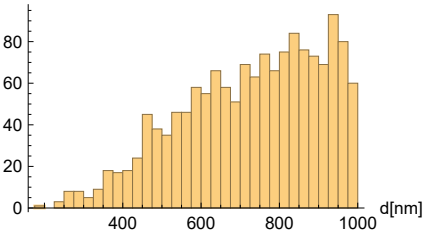



```
Sample num.:20310, number of trajectories:4143
```

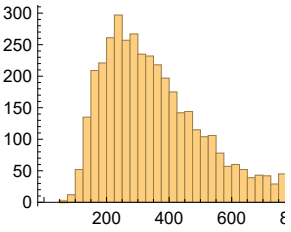
diameter dist., log. fit,
MSD=2D/v*ln(1+vt)

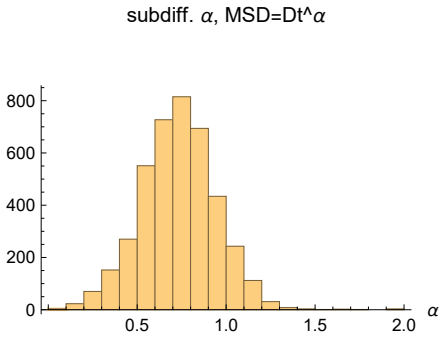


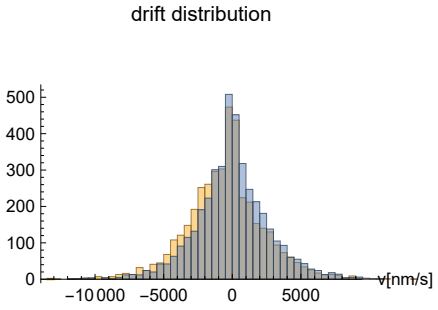
diameter dist., lin. fit,
MSD=2Dt, full length



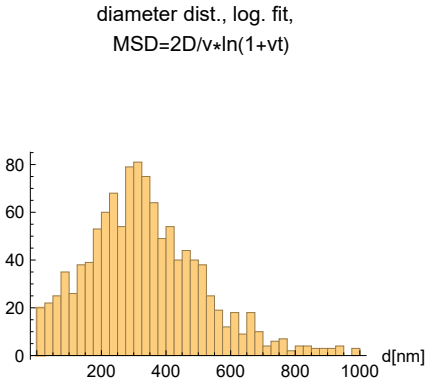
diameter dist, lin. fit
MSD=2Dt,truncate

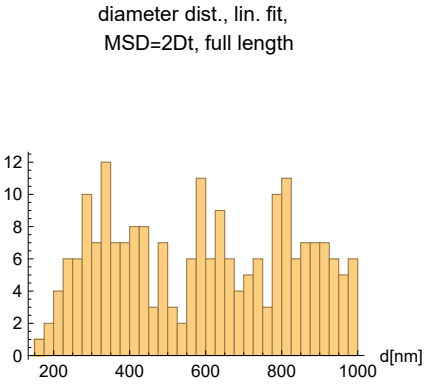


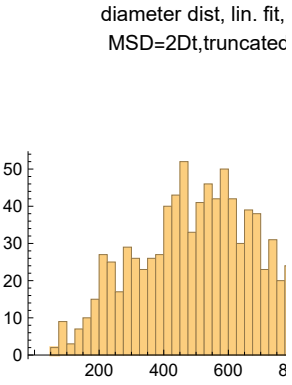


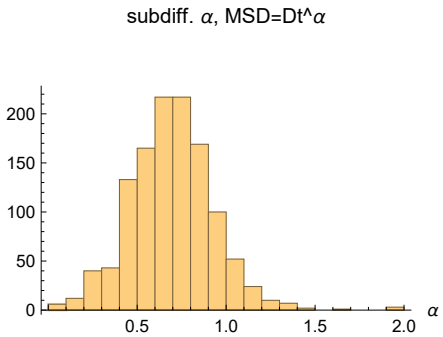


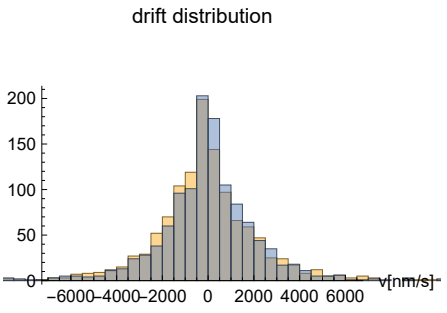

```
Sample num.:4531, number of trajectories:1201
```





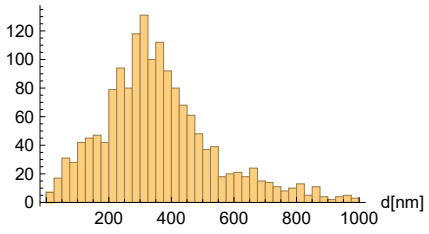




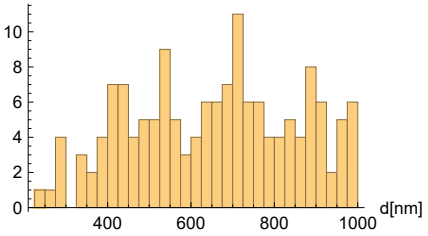



```
Sample num.:4532, number of trajectories:1670
```

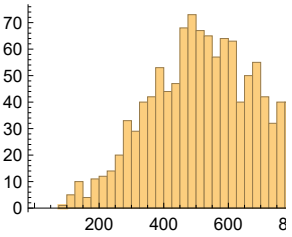
diameter dist., log. fit,
MSD=2D/v*ln(1+vt)



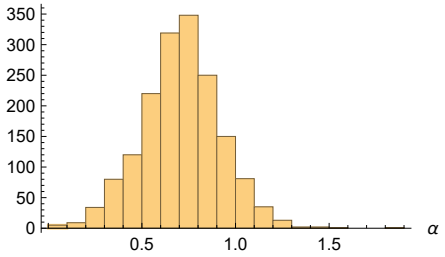
diameter dist., lin. fit,
MSD=2Dt, full length



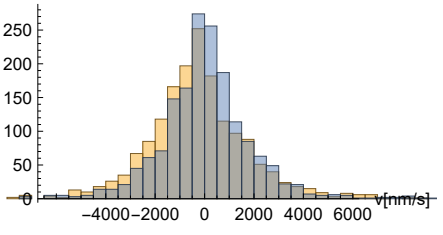
diameter dist, lin. fit,
MSD=2Dt,truncatec



subdiff. α, MSD=Dt^α

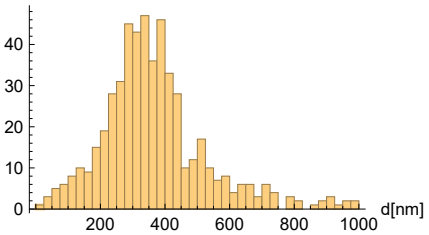


drift distribution

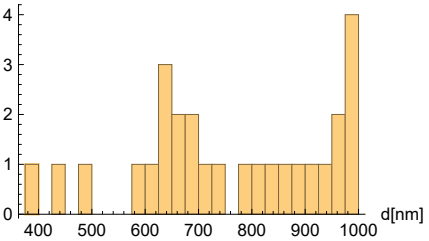



```
Sample num.:4535, number of trajectories:537
```

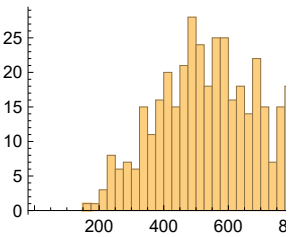
diameter dist., log. fit,
MSD=2D/v*ln(1+vt)

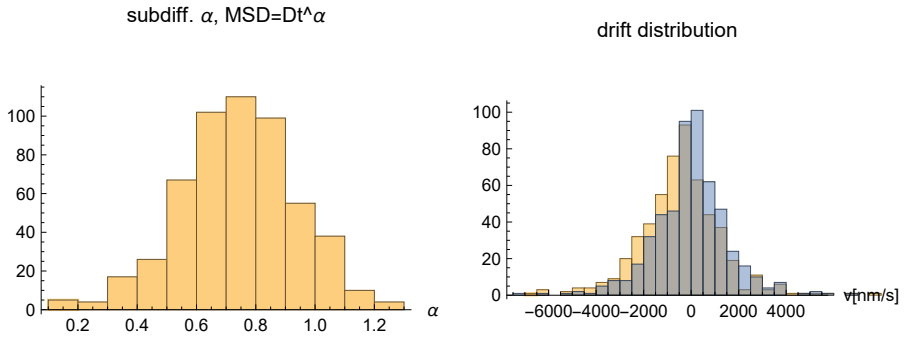


diameter dist., lin. fit,
MSD=2Dt, full length



diameter dist, lin. fit,
MSD=2Dt,truncatec






```
num1 = 417;(*450;486;557;*)
num2 = 94;
num3 = 100;
sample1 = Transpose[{Transpose[MSDtot[[1, num1]]][[1]] / fr[[1, zpliku[[1, num1]]]],
    calib[[1, zpliku[[1, num1]]]]^2 * Transpose[MSDtot[[1, num1]]][[2]]}];
sample2 = Transpose[{Transpose[MSDtot[[1, num2]]][[1]] / fr[[1, zpliku[[1, num2]]]],
    calib[[1, zpliku[[1, num2]]]]^2 * Transpose[MSDtot[[1, num2]]][[2]]}];
sample3 = Transpose[{Transpose[MSDtot[[1, num3]]][[1]] / fr[[1, zpliku[[1, num3]]]],
    calib[[1, zpliku[[1, num3]]]]^2 * Transpose[MSDtot[[1, num3]]][[2]]}];
Show[ListLogLogPlot[{sample1, sample2, sample3, {sample1[[inclentot[[1, num1]]]]},
   {sample2[[inclentot[[1, num2]]]]}, {sample3[[inclentot[[1, num3]]]]}},
  Joined → False, PlotMarkers → {Style[●, 30], Style[■, 30], Style[▲, 30]},
  Filling → {4 → Axis, 5 → Axis, 6 → Axis},
  FillingStyle → Directive[{Thickness[0.003], Dashed, Opacity[0.8]}],
  PlotStyle → {ColorData["Crayola"]["NavyBlue"], ColorData["Crayola"]["OliveGreen"],
    ColorData["Crayola"]["BrickRed"], ColorData["Crayola"]["NavyBlue"],
    ColorData["Crayola"]["OliveGreen"], ColorData["Crayola"]["BrickRed"]},
  AxesLabel → {"t[s]", "MSD[nm^2]"}, PlotRange → {All, {5 * 10^4, 6 * 10^7}},
  LabelStyle → {30, Bold}, Epilog → Inset[Style["A", 40, Bold], Scaled[{0.9, 0.975}]]],
 LogLogPlot[{
   calib[[1, zpliku[[1, num1]]]]^2 * lintrunctot[[1, num1]][fr[[1, zpliku[[1, num1]]]] * x],
   calib[[1, zpliku[[1, num1]]]]^2 * logfittot[[1, num1]][fr[[1, zpliku[[1, num1]]]] * x],
   calib[[1, zpliku[[1, num1]]]]^2 * fittot[[1, num1]][fr[[1, zpliku[[1, num1]]]] * x],
   calib[[1, zpliku[[1, num2]]]]^2 * lintrunctot[[1, num2]][fr[[1, zpliku[[1, num2]]]] * x],
   calib[[1, zpliku[[1, num2]]]]^2 * logfittot[[1, num2]][fr[[1, zpliku[[1, num2]]]] * x],
   calib[[1, zpliku[[1, num2]]]]^2 * fittot[[1, num2]][fr[[1, zpliku[[1, num2]]]] * x],
   calib[[1, zpliku[[1, num3]]]]^2 * lintrunctot[[1, num3]][fr[[1, zpliku[[1, num3]]]] * x],
   calib[[1, zpliku[[1, num3]]]]^2 * logfittot[[1, num3]][fr[[1, zpliku[[1, num3]]]] * x],
   calib[[1, zpliku[[1, num3]]]]^2 * fittot[[1, num3]][fr[[1, zpliku[[1, num3]]]] * x]},
  {x, 0, 10},
  PlotStyle → Evaluate[{{Blue, s2, s1}, {Blue, s1}, {Blue, s3, s1}, {s2, Green, s1},
     {Green, s1}, {s3, Green, s1}, {s2, Red, s1}, {Red, s1}, {s3, Red, s1}} /.
    {s1 → AbsoluteThickness[5], s2 → AbsoluteDashing[{5, 10}],
     s3 → AbsoluteDashing[{20, 10}]}],
  PlotLegends → Placed[LineLegend[{
```

```
StringForm["D1 t + C^2 \nD1 = `` ± `` [nm^2/s] \nC^2 = `` ± `` [nm^2]",
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   lintrunctot[[1, num1]]["BestFitParameters"][[1, 2]] * fr[[1, zpliku[[1, num1]]]], 3],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   lintrunctot[[1, num1]]["ParameterErrors"][[1]] * fr[[1, zpliku[[1, num1]]]], 2],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   lintrunctot[[1, num1]]["BestFitParameters"][[2, 2]]^2, 2],
 ScientificForm[
  calib[[1, zpliku[[1, num1]]]]^2 * lintrunctot[[1, num1]]["ParameterErrors"][[2]] *
   2 * lintrunctot[[1, num1]]["BestFitParameters"][[2, 2]], 2]],
StringForm["D1 / v * log(1 + v t) + C^2 \nD1 = `` ± `` [nm^2/s] \nv = `` ± `` [1/s] \nC^2 = `` ± `` [nm^2]",
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   logfittot[[1, num1]]["BestFitParameters"][[1, 2]] * fr[[1, zpliku[[1, num1]]]], 3],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 * logfittot[[1, num1]][
    "ParameterErrors"][[1]] * fr[[1, zpliku[[1, num1]]]], 2], ScientificForm[
  calib[[1, zpliku[[1, num1]]]]^2 * logfittot[[1, num1]]["BestFitParameters"][[2, 2]] *
   fr[[1, zpliku[[1, num1]]]], 3], ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   logfittot[[1, num1]]["ParameterErrors"][[2]] * fr[[1, zpliku[[1, num1]]]], 2],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   logfittot[[1, num1]]["BestFitParameters"][[3, 2]]^2, 2],
 ScientificForm[
  calib[[1, zpliku[[1, num1]]]]^2 * logfittot[[1, num1]]["ParameterErrors"][[3]] *
   2 * logfittot[[1, num1]]["BestFitParameters"][[2, 2]], 2]],
StringForm["D_α t^α + C^2 \nD_α = `` ± `` [nm^2/s^α] \nα = `` ± `` \nC^2 = `` ± `` [nm^2]",
 ScientificForm[
  calib[[1, zpliku[[1, num1]]]]^2 * fittot[[1, num1]]["BestFitParameters"][[1, 2]] *
   fr[[1, zpliku[[1, num1]]]]^fittot[[1, num1]]["BestFitParameters"][[2, 2]], 3],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 * fittot[[1, num1]]["ParameterErrors"][[
    1]] * fr[[1, zpliku[[1, num1]]]]^fittot[[1, num1]]["BestFitParameters"][[2, 2]], 2],
 NumberForm[fittot[[1, num1]]["BestFitParameters"][[2, 2]], 3],
 NumberForm[fittot[[1, num1]]["ParameterErrors"][[2]], 2],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 *
   fittot[[1, num1]]["BestFitParameters"][[3, 2]]^2, 2],
 ScientificForm[calib[[1, zpliku[[1, num1]]]]^2 * fittot[[1, num1]]["ParameterErrors"][[
    3]] * 2 * fittot[[1, num1]]["BestFitParameters"][[3, 2]], 2]],
StringForm["D1 t + C^2 \nD1 = `` ± `` [nm^2/s] \nC^2 = `` ± `` [nm^2]",
 ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
   lintrunctot[[1, num2]]["BestFitParameters"][[1, 2]] * fr[[1, zpliku[[1, num2]]]], 3],
 ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
   lintrunctot[[1, num2]]["ParameterErrors"][[1]] * fr[[1, zpliku[[1, num2]]]], 2],
 ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
   lintrunctot[[1, num2]]["BestFitParameters"][[2, 2]]^2, 2],
 ScientificForm[
  calib[[1, zpliku[[1, num2]]]]^2 * lintrunctot[[1, num2]]["ParameterErrors"][[2]] *
   2 * lintrunctot[[1, num2]]["BestFitParameters"][[2, 2]], 2]],
StringForm["D1 / v * log(1 + v t) + C^2 \nD1 = `` ± `` [nm^2/s] \nv = `` ± `` [1/s] \nC^2 = `` ± `` [nm^2]",
 ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
   logfittot[[1, num2]]["BestFitParameters"][[1, 2]] * fr[[1, zpliku[[1, num2]]]], 3],
 ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
```

```
    logfittot[[1, num2]]["ParameterErrors"][[1]] * fr[[1, zpliku[[1, num2]]]], 2],
  ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 * logfittot[[1, num2]][
      "BestFitParameters"][[2, 2]] * fr[[1, zpliku[[1, num2]]]], 3], ScientificForm[
   calib[[1, zpliku[[1, num2]]]]^2 * logfittot[[1, num2]]["ParameterErrors"][[2]] *
    fr[[1, zpliku[[1, num2]]]], 2], ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
    logfittot[[1, num2]]["BestFitParameters"][[3, 2]]^2, 2],
  ScientificForm[
   calib[[1, zpliku[[1, num2]]]]^2 * logfittot[[1, num2]]["ParameterErrors"][[3]] *
    2 * logfittot[[1, num2]]["BestFitParameters"][[2, 2]], 2]],
 StringForm["D_αt^α+C^2\nD_α=``±``[nm^2/s^α]\nα=``±``\nC^2=``±``[nm^2]", ScientificForm[
   calib[[1, zpliku[[1, num2]]]]^2 * fittot[[1, num2]]["BestFitParameters"][[1, 2]] *
    fr[[1, zpliku[[1, num2]]]]^fittot[[1, num2]]["BestFitParameters"][[2, 2]], 3],
  ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 * fittot[[1, num2]]["ParameterErrors"][[
     1]] * fr[[1, zpliku[[1, num2]]]]^fittot[[1, num2]]["BestFitParameters"][[2, 2]], 2],
  NumberForm[fittot[[1, num2]]["BestFitParameters"][[2, 2]], 3],
  NumberForm[fittot[[1, num2]]["ParameterErrors"][[2]], 2],
  ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 *
    fittot[[1, num2]]["BestFitParameters"][[3, 2]]^2, 2],
  ScientificForm[calib[[1, zpliku[[1, num2]]]]^2 * fittot[[1, num2]]["ParameterErrors"][[
     3]] * 2 * fittot[[1, num2]]["BestFitParameters"][[3, 2]], 2]],
 StringForm["D_1t+C^2\nD_1=``±``[nm^2/s]\nC^2=``±``[nm^2]",
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
    lintrunctot[[1, num3]]["BestFitParameters"][[1, 2]] * fr[[1, zpliku[[1, num3]]]], 3],
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
    lintrunctot[[1, num3]]["ParameterErrors"][[1]] * fr[[1, zpliku[[1, num3]]]], 2],
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
    lintrunctot[[1, num3]]["BestFitParameters"][[2, 2]]^2, 2],
  ScientificForm[
   calib[[1, zpliku[[1, num3]]]]^2 * lintrunctot[[1, num3]]["ParameterErrors"][[2]] *
    2 * lintrunctot[[1, num3]]["BestFitParameters"][[2, 2]], 2]],
 StringForm["D_1/v*Log(1+vt)+C^2\nD_1=``±``[nm^2/s]\nv=``±``[1/s]\nC^2=``±``[nm^2]",
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
    logfittot[[1, num3]]["BestFitParameters"][[1, 2]] * fr[[1, zpliku[[1, num3]]]], 3],
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 * logfittot[[1, num3]][
      "ParameterErrors"][[1]] * fr[[1, zpliku[[1, num3]]]], 2], ScientificForm[
   calib[[1, zpliku[[1, num3]]]]^2 * logfittot[[1, num3]]["BestFitParameters"][[2, 2]] *
    fr[[1, zpliku[[1, num3]]]], 3], ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
    logfittot[[1, num3]]["ParameterErrors"][[2]] * fr[[1, zpliku[[1, num3]]]], 2],
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
    logfittot[[1, num3]]["BestFitParameters"][[3, 2]]^2, 2],
  ScientificForm[
   calib[[1, zpliku[[1, num3]]]]^2 * logfittot[[1, num3]]["ParameterErrors"][[3]] *
    2 * logfittot[[1, num3]]["BestFitParameters"][[2, 2]], 2]],
 StringForm["D_αt^α+C^2\nD_α=``±``[nm^2/s^α]\nα=``±``\nC^2=``±``[nm^2]", ScientificForm[
   calib[[1, zpliku[[1, num3]]]]^2 * fittot[[1, num3]]["BestFitParameters"][[1, 2]] *
    fr[[1, zpliku[[1, num3]]]]^fittot[[1, num3]]["BestFitParameters"][[2, 2]], 3],
  ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 * fittot[[1, num3]]["ParameterErrors"][[
     1]] * fr[[1, zpliku[[1, num3]]]]^fittot[[1, num3]]["BestFitParameters"][[2, 2]], 2],
  NumberForm[fittot[[1, num3]]["BestFitParameters"][[2, 2]], 3],
```

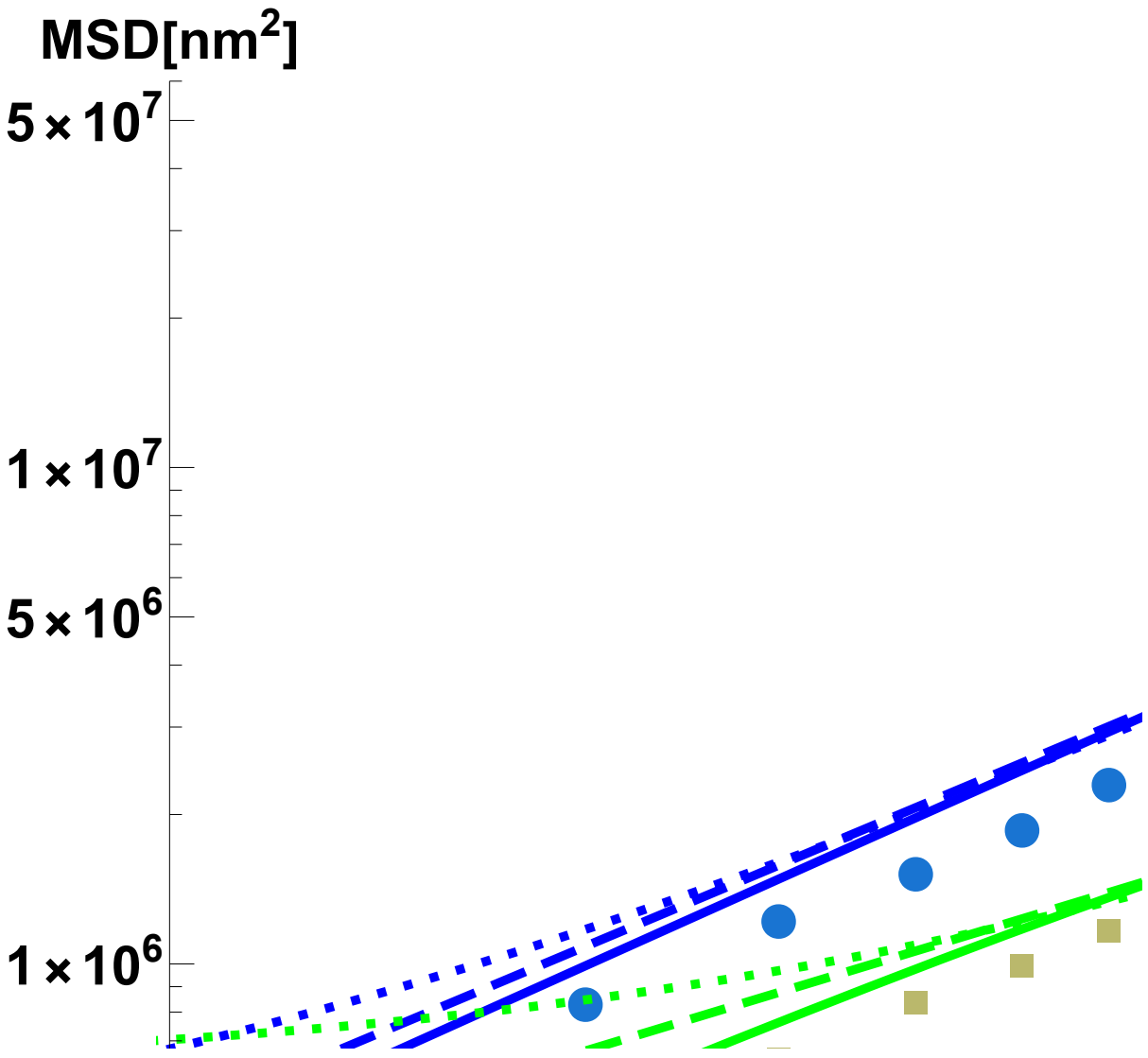
```
        NumberForm[fittot[[1, num3]]["ParameterErrors"][[2]], 2],
        ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 *
          fittot[[1, num3]]["BestFitParameters"][[3, 2]]^2, 2],
        ScientificForm[calib[[1, zpliku[[1, num3]]]]^2 * fittot[[1, num3]]["ParameterErrors"][[
            3]] * 2 * fittot[[1, num3]]["BestFitParameters"][[3, 2]], 2]]
      }, LegendLayout → {"Column", 3}, LabelStyle → {25}, LegendMarkerSize → {100, 100}
      (*,LegendLabel→Placed["D₁t\n(D₁/v) log(1+vt)\n\n Dαt^α\n",Left]*)], Below]
]], ImageSize → {1500, 1000}]
```

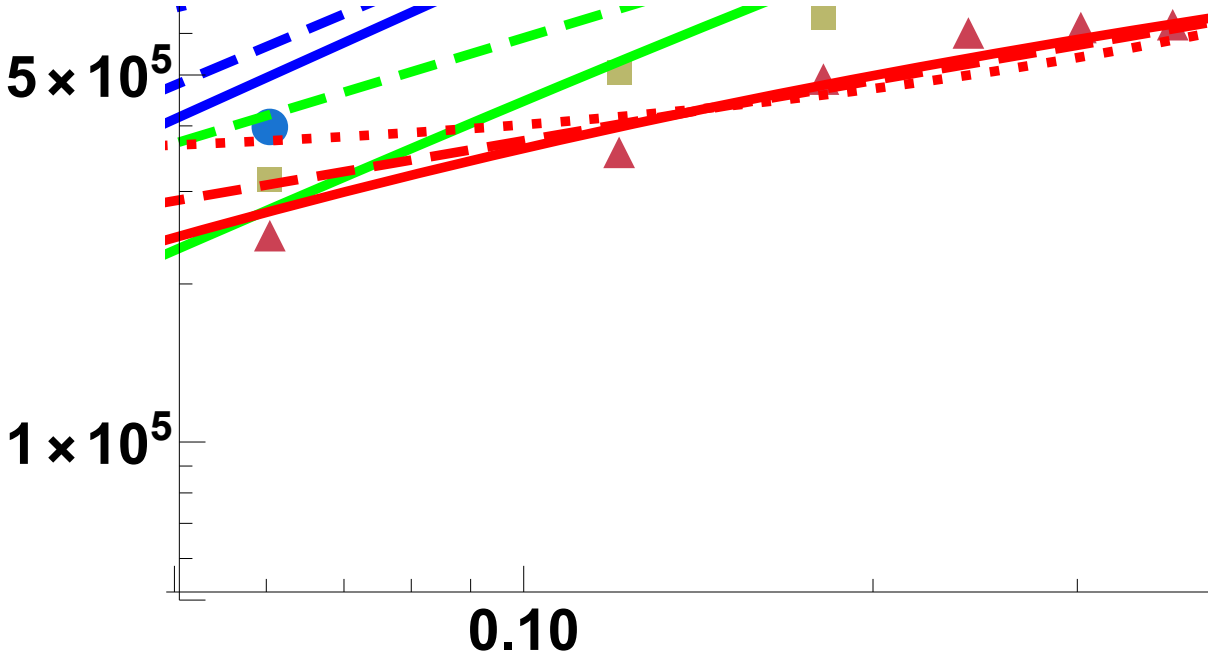
FittedModel: The property values {ParameterErrors} assume an unconstrained model. The results for these properties may not be valid, particularly if the fitted parameters are near a constraint boundary.

FittedModel: The property values {ParameterErrors} assume an unconstrained model. The results for these properties may not be valid, particularly if the fitted parameters are near a constraint boundary.

FittedModel: The property values {ParameterErrors} assume an unconstrained model. The results for these properties may not be valid, particularly if the fitted parameters are near a constraint boundary.

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





$D_1 t + C^2$

$D_1 = 7.1 \times 10^6 \pm 1.1 \times 10^5 [\mathrm{nm}^2/\mathrm{s}]$

$C^2 = 3.2 \times 10^5 \pm 2.2 \times 10^5 [\mathrm{nm}^2]$

$D_1 / v * \log(1 + vt) + C^2$

$D_1 = 8.26 \times 10^6 \pm 2.3 \times 10^5 [\mathrm{nm}^2/\mathrm{s}]$

$v = 3.16 \times 10^3 \pm 7.3 \times 10^2 [1/\mathrm{s}]$

$C^2 = 2.8 \times 10^{-54} \pm 3.2 \times 10^{-28} [\mathrm{nm}^2]$

$D_\alpha t^\alpha + C^2$

$D_\alpha = 7.72 \times 10^6 \pm 5.8 \times 10^5 [\mathrm{nm}^2/s^\alpha]$

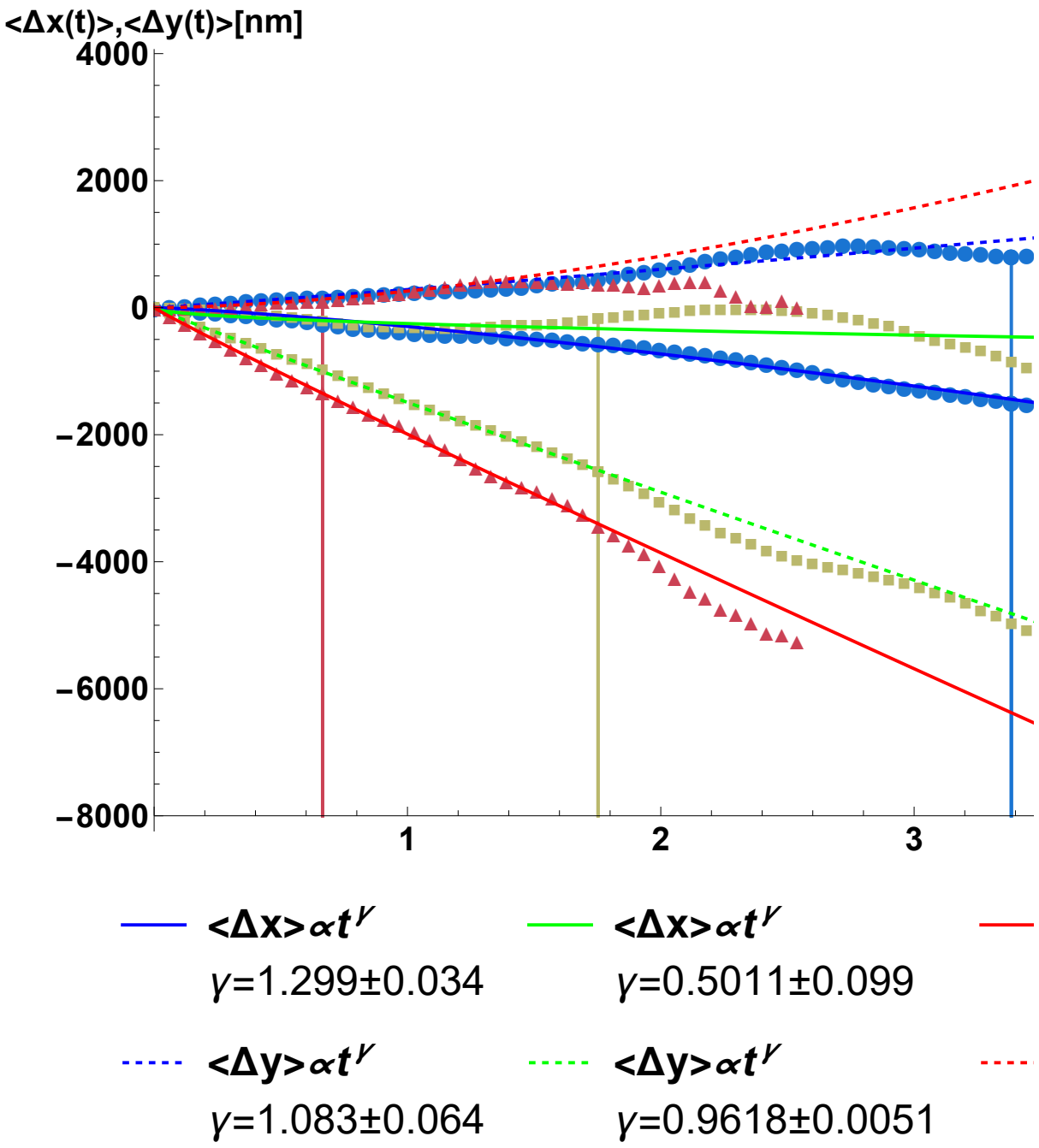
$\alpha = 0.929 \pm 0.02$

$C^2 = 1.9 \times 10^{-43} \pm -2.5 \times 10^{-43} [\mathrm{nm}^2]$

```
vsample1x = Transpose[{Transpose[driftXtot[[1, num1]]][[1]] / fr[[1, zpliku[[1, num1]]]],
    calib[[1, zpliku[[1, num1]]]] * Transpose[driftXtot[[1, num1]]][[2]]}];
```

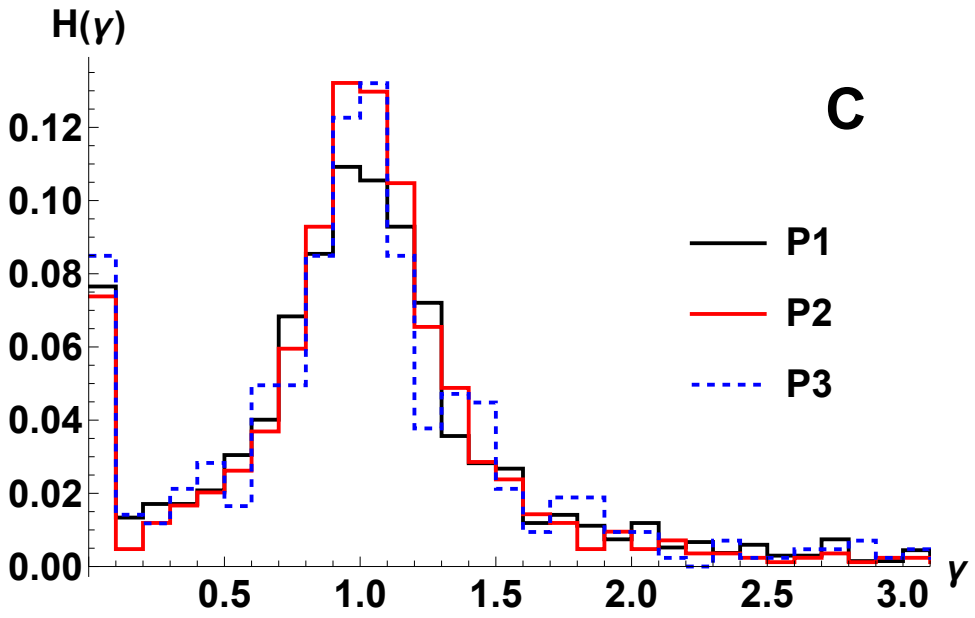
```
vsample2x = Transpose[{Transpose[driftXtot[[1, num2]]][[1]] / fr[[1, zpliku[[1, num2]]]],
    calib[[1, zpliku[[1, num2]]]] * Transpose[driftXtot[[1, num2]]][[2]]}];
vsample3x = Transpose[{Transpose[driftXtot[[1, num3]]][[1]] / fr[[1, zpliku[[1, num3]]]],
    calib[[1, zpliku[[1, num3]]]] * Transpose[driftXtot[[1, num3]]][[2]]}];
vsample1y = Transpose[{Transpose[driftYtot[[1, num1]]][[1]] / fr[[1, zpliku[[1, num1]]]],
    calib[[1, zpliku[[1, num1]]]] * Transpose[driftYtot[[1, num1]]][[2]]}];
vsample2y = Transpose[{Transpose[driftYtot[[1, num2]]][[1]] / fr[[1, zpliku[[1, num2]]]],
    calib[[1, zpliku[[1, num2]]]] * Transpose[driftYtot[[1, num2]]][[2]]}];
vsample3y = Transpose[{Transpose[driftYtot[[1, num3]]][[1]] / fr[[1, zpliku[[1, num3]]]],
    calib[[1, zpliku[[1, num3]]]] * Transpose[driftYtot[[1, num3]]][[2]]}];
Show[ListPlot[{vsample1x, vsample1y, vsample2x, vsample2y, vsample3x, vsample3y,
   {vsample1x[[inclentot[[1, num1]]]]}, {vsample1y[[inclentot[[1, num1]]]]},
   {vsample2x[[inclentot[[1, num2]]]]}, {vsample2y[[inclentot[[1, num2]]]]},
   {vsample3x[[inclentot[[1, num3]]]]}, {vsample3y[[inclentot[[1, num3]]]]}},
  PlotRange → {{0, 5}, Automatic}, Joined → False, Filling → Table[i → Axis, {i, 7, 12}],
  PlotStyle → {ColorData["Crayola"]["NavyBlue"], ColorData["Crayola"]["NavyBlue"],
    ColorData["Crayola"]["OliveGreen"], ColorData["Crayola"]["OliveGreen"],
    ColorData["Crayola"]["BrickRed"], ColorData["Crayola"]["BrickRed"]},
  PlotMarkers → {Style[●, 15], Style[●, 15], Style[■, 15],
    Style[■, 15], Style[▲, 15], Style[▲, 15]},
  FillingStyle → Directive[Thickness[0.0025], Opacity[0.8]],
  PlotStyle → {Blue, {Blue, Dashed}, Green, {Green, Dashed}, Red, {Red, Dashed}},
  AxesLabel → {"t[s]", "<Δx(t)>,<Δy(t)>[nm]"},
  LabelStyle → {Bold, 20}, PlotMarkers → Automatic,
  (*PlotLegends→Placed[LineLegend[
     {"<Δx(t)>","<Δy(t)>","<Δx(t)>","<Δy(t)>","<Δx(t)>","<Δy(t)>"},
     LegendLayout→{"Column",3}],Scaled[{0.7,0.35}]],*)
  Epilog → Inset[Style["B", 30, Bold], Scaled[{0.9, 0.95}]],
  ImageSize → {900, 550}, AxesOrigin → {0, -8000}],
 Plot[{
   calib[[1, zpliku[[1, num1]]]] * driftfittot[[1, 1, num1]][t * fr[[1, zpliku[[1, num1]]]]],
   calib[[1, zpliku[[1, num1]]]] * driftfittot[[1, 2, num1]][t * fr[[1, zpliku[[1, num1]]]]],
   calib[[1, zpliku[[1, num2]]]] * driftfittot[[1, 1, num2]][t * fr[[1, zpliku[[1, num2]]]]],
   calib[[1, zpliku[[1, num2]]]] * driftfittot[[1, 2, num2]][t * fr[[1, zpliku[[1, num2]]]]],
   calib[[1, zpliku[[1, num3]]]] * driftfittot[[1, 1, num3]][t * fr[[1, zpliku[[1, num3]]]]],
   calib[[1, zpliku[[1, num3]]]] * driftfittot[[1, 2, num3]][t * fr[[1, zpliku[[1, num3]]]]]},
  {t, 0, 5},
  PlotStyle → {{Blue, Thick}, {Blue, Thick, Dashed}, {Green, Thick},
    {Green, Thick, Dashed}, {Red, Thick}, {Red, Thick, Dashed}},
  PlotLegends → Placed[LineLegend[{
      StringForm["<Δx>∝t^γ\nγ=``±``",
       NumberForm[driftfittot[[1, 1, num1]]["BestFitParameters"][[2, 2]], 4],
       NumberForm[driftfittot[[1, 1, num1]]["ParameterErrors"][[2]], 2]],
      StringForm["<Δy>∝t^γ\nγ=``±``",
       NumberForm[driftfittot[[1, 2, num1]]["BestFitParameters"][[2, 2]], 4],
       NumberForm[driftfittot[[1, 2, num1]]["ParameterErrors"][[2]], 2]],
      StringForm["<Δx>∝t^γ\nγ=``±``",
       NumberForm[driftfittot[[1, 1, num2]]["BestFitParameters"][[2, 2]], 4],
       NumberForm[driftfittot[[1, 1, num2]]["ParameterErrors"][[2]], 2]],
      StringForm["<Δy>∝t^γ\nγ=``±``",
```

```
        NumberForm[driftfittot[[1, 2, num2]]["BestFitParameters"][[2, 2]], 4],
        NumberForm[driftfittot[[1, 2, num2]]["ParameterErrors"][[2]], 2]],
       StringForm["<Δx>∝t^γ\nγ=``±``",
        NumberForm[driftfittot[[1, 1, num3]]["BestFitParameters"][[2, 2]], 4],
        NumberForm[driftfittot[[1, 1, num3]]["ParameterErrors"][[2]], 2]],
       StringForm["<Δy>∝t^γ\nγ=``±``",
        NumberForm[driftfittot[[1, 2, num3]]["BestFitParameters"][[2, 2]], 4],
        NumberForm[driftfittot[[1, 2, num3]]["ParameterErrors"][[2]], 2]]
      }, LegendLayout → {"Column", 3}, LabelStyle → {25}
     ], (*Scaled[{0.5,0.5}]*)Below]]]
(*vsample1x=Transpose[{Transpose[driftXtot[[1,num1]][[1]]/fr[[1,zpliku[[1,num1]]]],
   calib[[1,zpliku[[1,num1]]]]*Abs[Transpose[driftXtot[[1,num1]][[2]]]}];
vsample2x=Transpose[{Transpose[driftXtot[[1,num2]][[1]]/fr[[1,zpliku[[1,num2]]]],
   calib[[1,zpliku[[1,num2]]]]*Abs[Transpose[driftXtot[[1,num2]][[2]]]}];
vsample3x=Transpose[{Transpose[driftXtot[[1,num3]][[1]]/fr[[1,zpliku[[1,num3]]]],
   calib[[1,zpliku[[1,num3]]]]*Abs[Transpose[driftXtot[[1,num3]][[2]]]}];
vsample1y=Transpose[{Transpose[driftYtot[[1,num1]][[1]]/fr[[1,zpliku[[1,num1]]]],
   calib[[1,zpliku[[1,num1]]]]*Abs[Transpose[driftYtot[[1,num1]][[2]]]}];
vsample2y=Transpose[{Transpose[driftYtot[[1,num2]][[1]]/fr[[1,zpliku[[1,num2]]]],
   calib[[1,zpliku[[1,num2]]]]*Abs[Transpose[driftYtot[[1,num2]][[2]]]}];
vsample3y=Transpose[{Transpose[driftYtot[[1,num3]][[1]]/fr[[1,zpliku[[1,num3]]]],
   calib[[1,zpliku[[1,num3]]]]*Abs[Transpose[driftYtot[[1,num3]][[2]]]}];
ListLogLogPlot[{vsample1x,vsample1y,vsample2x,vsample2y,vsample3x,
  vsample3y,{vsample1x[[inclentot[[1,num1]]]]},{vsample1y[[inclentot[[1,num1]]]]},
  {vsample2x[[inclentot[[1,num2]]]]},{vsample2y[[inclentot[[1,num2]]]]},
  {vsample3x[[inclentot[[1,num3]]]]},{vsample3y[[inclentot[[1,num3]]]]}},
 Joined→False,Filling→Table[i→Axis,{i,7,12}],
 PlotStyle→{Blue,{Blue,Dashed},Green,{Green,Dashed},Red,{Red,Dashed}},
 AxesLabel→{"t[s]","<Δx(t)>,<Δy(t)>[nm]"},
 LabelStyle→{Bold,20},PlotMarkers→Automatic,PlotLegends→
  Placed[LineLegend[{"<Δx(t)>","<Δy(t)>","<Δx(t)>","<Δy(t)>","<Δx(t)>","<Δy(t)>"},
    LegendLayout→{"Column",3}],Scaled[{0.7,0.35}]],ImageSize→{900,600}]*)
```

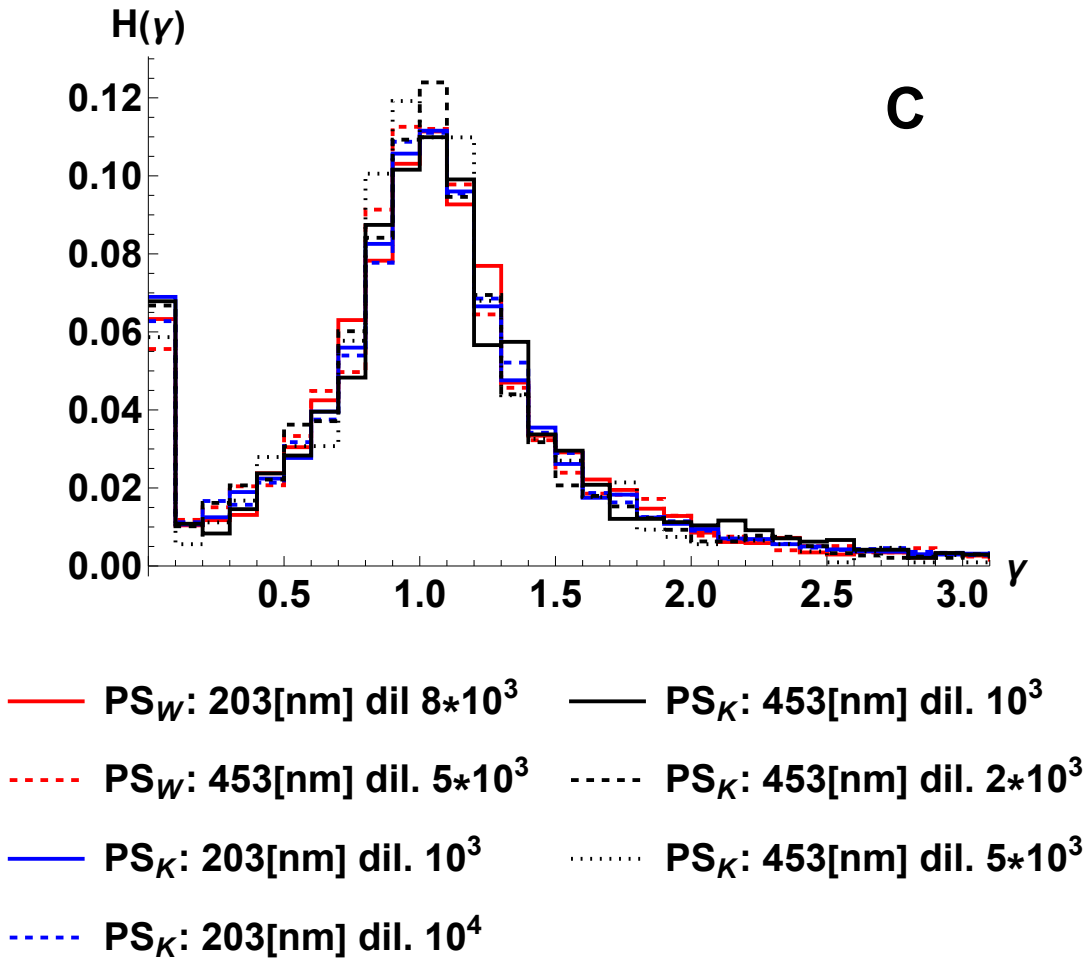


In[ ]:=
```
(*drift histogram*)
binvel = 0.1;
velexpdata = Table[{ParallelTable[driftfittot[[it, 1, i]]["BestFitParameters"][[2, 2]],
      {i, 1, Length[driftfittot[[it, 1]]]}],
     ParallelTable[driftfittot[[it, 2, i]]["BestFitParameters"][[2, 2]],
      {i, 1, Length[driftfittot[[it, 2]]]}]}, {it, 1, 10}];
velexp = ParallelTable[
   Transpose[{Drop[HistogramList[Abs[Flatten[{velexpdata[[it, 1]], velexpdata[[it, 2]]}]],
        {binvel}, "Probability"][[1]], -1],
      HistogramList[Abs[Flatten[{velexpdata[[it, 1]], velexpdata[[it, 2]]}]],
        {binvel}, "Probability"][[2]]}]
   , {it, 1, 10}];
```

```
ListPlot[Take[velexp, 3], PlotRange → {{0, 3.1}, All},
 Joined → True, InterpolationOrder → 0, PlotStyle →
  {{Black, Thick}, {Red, Thick}, {Blue, Dashed, Thick}}, AxesLabel → {"γ", "H(γ)"},
 PlotLegends → Placed[{"P1", "P2", "P3"}, Scaled[{0.8, 0.5}]],
 PlotRangeClipping → True, LabelStyle → {20, Bold},
 Epilog → Inset[Style["C", 30, Bold], Scaled[{0.9, 0.9}]], ImageSize → {500, 360}]
N[Length[
   Select[Abs[Flatten[{velexpdata[[1, 1]], velexpdata[[1, 2]]}]], Abs[# - 1.0] ≤ 0.2 &]] /
  Length[Abs[Flatten[{velexpdata[[1, 1]], velexpdata[[1, 2]]}]]]]
ListPlot[Take[velexp, -7], PlotRange → {{0, 3.1}, All},
 Joined → True, InterpolationOrder → 0,
 PlotStyle → {{Red, Thick}, {Red, Thick, Dashed}, {Blue, Thick}, {Blue, Thick, Dashed},
   {Black, Thick}, {Black, Thick, Dashed}, {Black, Thick, Dotted}},
 AxesLabel → {"γ", "H(γ)"}, PlotLegends → Placed[LineLegend[{"PS_W: 203[nm] dil 8*10^3",
     "PS_W: 453[nm] dil. 5*10^3", "PS_K: 203[nm] dil. 10^3", "PS_K: 203[nm] dil. 10^4",
     "PS_K: 453[nm] dil. 10^3", "PS_K: 453[nm] dil. 2*10^3", "PS_K: 453[nm] dil. 5*10^3"},
    LegendLayout → {"Column", 2}], Below(*Scaled[{0.95,0.5}]*)],
 PlotRangeClipping → True, LabelStyle → {20, Bold},
 Epilog → Inset[Style["C", 30, Bold], Scaled[{0.9, 0.9}]],
 ImageSize → {500, 360}]
N[Length[
   Select[Abs[Flatten[{velexpdata[[1, 1]], velexpdata[[1, 2]]}]], Abs[# - 1.0] ≤ 0.2 &]] /
  Length[Abs[Flatten[{velexpdata[[1, 1]], velexpdata[[1, 2]]}]]]]
```

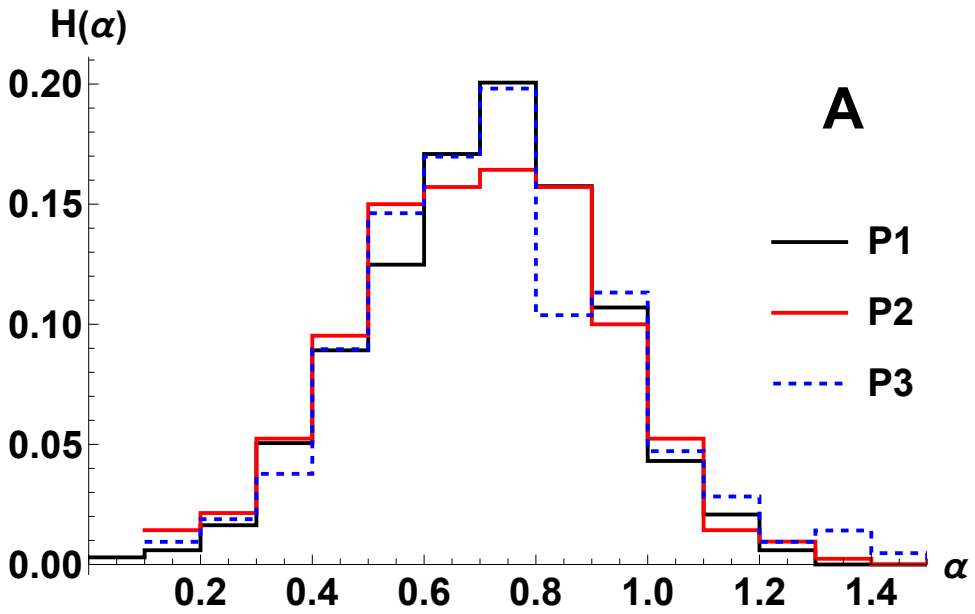


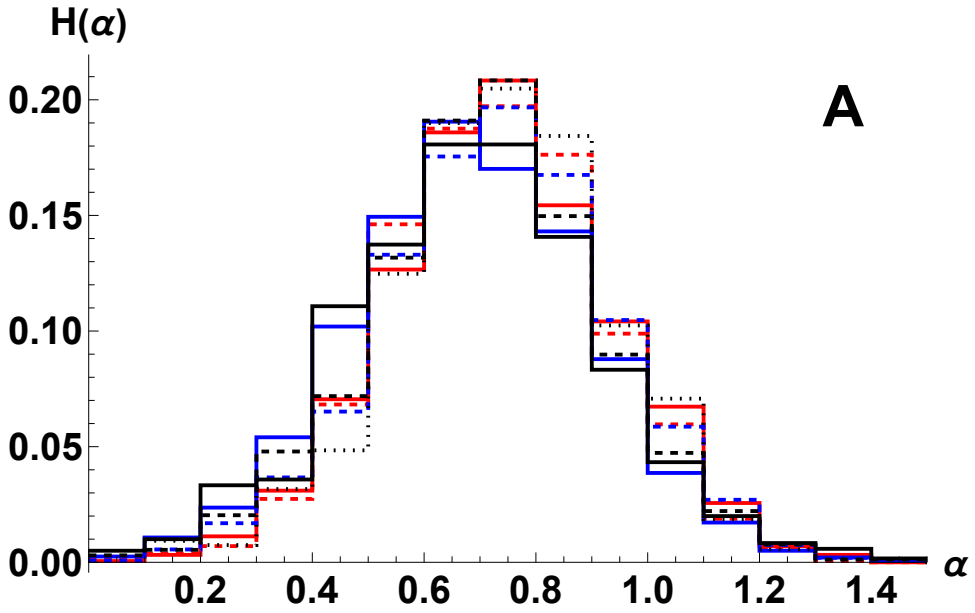

```
0.393016
```


H(γ)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.5
1.0
1.5
2.0
2.5
3.0
γ
C
PS_W: 203[nm] dil 8∗10^3
PS_K: 453[nm] dil. 10^3
PS_W: 453[nm] dil. 5∗10^3
PS_K: 453[nm] dil. 2∗10^3
PS_K: 203[nm] dil. 10^3
PS_K: 453[nm] dil. 5∗10^3
PS_K: 203[nm] dil. 10^4

0.393016

```
(*alpha histogram*)
alphashist =
  Table[Transpose[{Drop[HistogramList[alphastot[[i]], {0.1}, "Probability"][[1]], -1],
     HistogramList[alphastot[[i]], {0.1}, "Probability"][[2]]}],
   {i, 1, Length[alphastot]}];
ListPlot[Take[alphashist, 3],
 PlotRange → {{0, 1.5}, All}, Joined → True, InterpolationOrder → 0,
 PlotStyle → {{Black, Thick}, {Red, Thick}, {Blue, Dashed, Thick}},
 AxesLabel → {"α", "H(α)"},
 PlotLegends → Placed[{"P1", "P2", "P3"}, Scaled[{0.9, 0.5}]],
 PlotRangeClipping → True, LabelStyle → {20, Bold},
 Epilog → Inset[Style["A", 30, Bold], Scaled[{0.9, 0.9}]], ImageSize → {500, 360}]
ListPlot[Take[alphashist, -7],
 PlotRange → {{0, 1.5}, All}, Joined → True, InterpolationOrder → 0,
 PlotStyle → {{Red, Thick}, {Red, Thick, Dashed}, {Blue, Thick}, {Blue, Thick, Dashed},
   {Black, Thick}, {Black, Thick, Dashed}, {Black, Thick, Dotted}},
 AxesLabel → {"α", "H(α)"}(*,PlotLegends→Placed[LineLegend[
    {"I₁: 200[nm]","I₁: 453[nm]","I₂: 203[nm] dil. 10³","I₂: 203[nm] dil. 10⁴",
     "I₂: 453[nm] dil. 10³","I₂: 453[nm] dil. 2*10³","I₂: 453[nm] dil. 5*10³" },
    LegendLayout→{"Column",2}],Below(*Scaled[{0.95,0.5}]*)]*),
 PlotRangeClipping → True, LabelStyle → {20, Bold},
 Epilog → Inset[Style["A", 30, Bold], Scaled[{0.9, 0.9}]],
 ImageSize → {500, 360}]
Print["how many"]
Table[Length[alphastot[[i]]], {i, 1, Length[alphastot]}]
Print["mean alpha and stddev"]
Table[{Mean[alphastot[[i]]], StandardDeviation[alphastot[[i]]]},
 {i, 1, Length[alphastot]}]
```





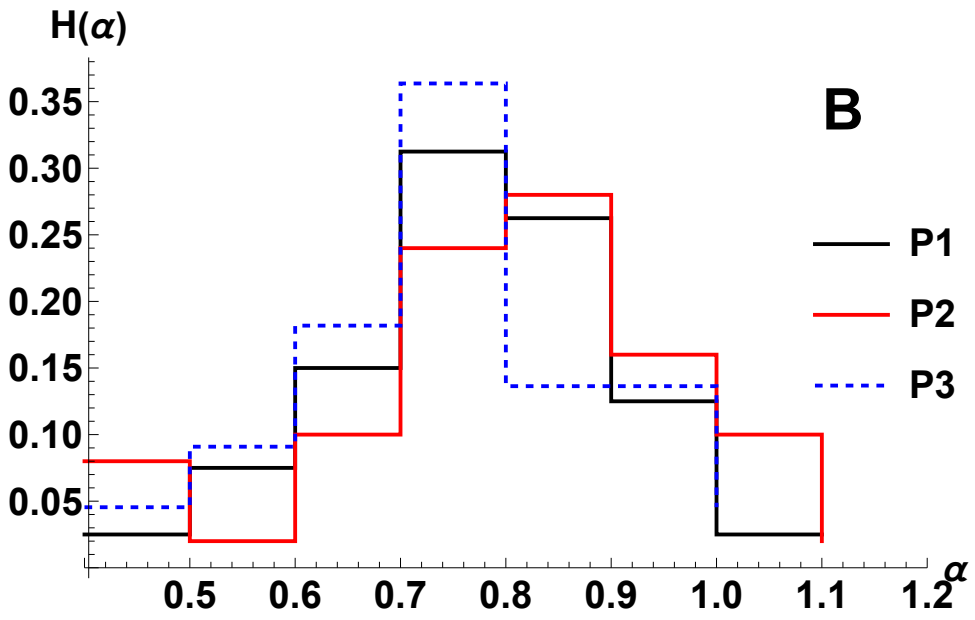
how many

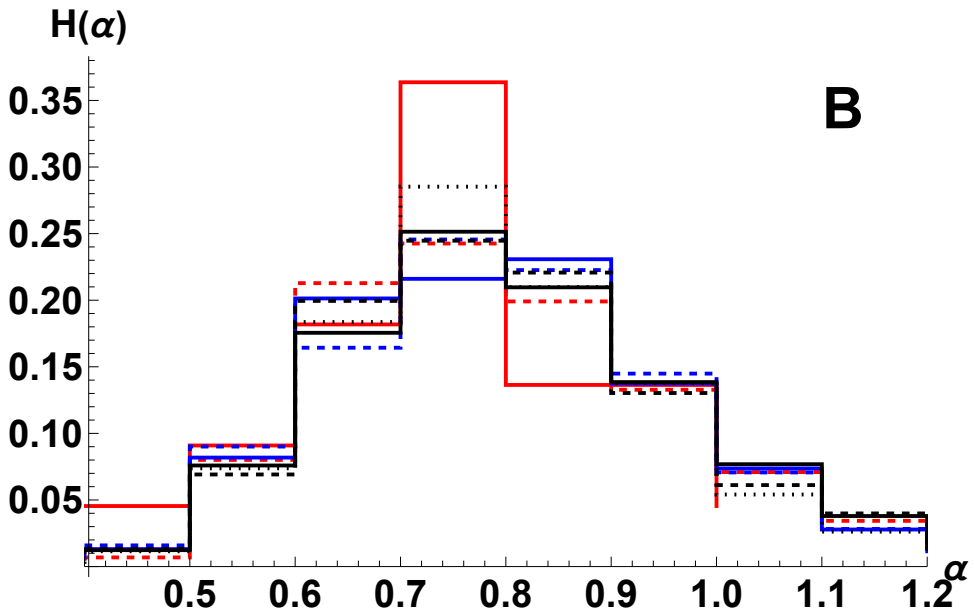
{673, 420, 212, 1872, 1861, 6807, 4143, 1201, 1670, 537}

mean alpha and stddev

{{0.71268, 0.224058}, {0.707675, 0.244343}, {0.731573, 0.262445}, {0.738105, 0.203724},
 {0.731013, 0.195548}, {0.686073, 0.219023}, {0.733017, 0.210431},
 {0.696377, 0.235386}, {0.712148, 0.211546}, {0.740567, 0.19447}}

```
longalphas = Table[Pick[alphastot[[i]],
    Length[#] > 50(*&&Length[#]<60*) & /@ MSDtot[[i]]], {i, 1, Length[alphastot]}];
longalphashist =
  Table[Transpose[{Drop[HistogramList[longalphas[[i]], {0.1}, "Probability"][[1]], -1],
     HistogramList[longalphas[[i]], {0.1}, "Probability"][[2]]}], {i, 1, 9}];
ListPlot[Take[longalphashist, 3],
 PlotRange → {{0.4, 1.2}, All}, Joined → True, InterpolationOrder → 0,
 PlotStyle → {{Black, Thick}, {Red, Thick}, {Blue, Dashed, Thick}, Green, Gray, Orange},
 AxesLabel → {"α", "H(α)"},
 PlotLegends → Placed[{"P1", "P2", "P3"}, Scaled[{0.95, 0.5}]],
 PlotRangeClipping → False, LabelStyle → {20, Bold},
 Epilog → Inset[Style["B", 30, Bold], Scaled[{0.9, 0.9}]], ImageSize → {500, 360}]
ListPlot[Take[longalphashist, -7],
 PlotRange → {{0.4, 1.2}, All}, Joined → True, InterpolationOrder → 0,
 PlotStyle → {{Red, Thick}, {Red, Thick, Dashed}, {Blue, Thick}, {Blue, Thick, Dashed},
   {Black, Thick}, {Black, Thick, Dashed}, {Black, Thick, Dotted}},
 AxesLabel → {"α", "H(α)"}(*,PlotLegends→Placed[LineLegend[
    {"I₁: 200[nm]","I₁: 453[nm]","I₂: 203[nm] dil. 10³","I₂: 203[nm] dil. 10⁴",
     "I₂: 453[nm] dil. 10³","I₂: 453[nm] dil. 2*10³","I₂: 453[nm] dil. 5*10³" },
    LegendLayout→{"Column",2}],Below(*Scaled[{0.95,0.5}]*)]*),
 PlotRangeClipping → True, LabelStyle → {20, Bold},
 Epilog → Inset[Style["B", 30, Bold], Scaled[{0.9, 0.9}]],
 ImageSize → {500, 360}]
Print["how many"]
Table[Length[longalphas[[i]]], {i, 1, Length[longalphas]}]
Print["mean alpha and stddev"]
Table[{Mean[longalphas[[i]]], StandardDeviation[longalphas[[i]]]},
 {i, 1, Length[alphastot]}]
```





how many

{80, 50, 22, 437, 611, 566, 1054, 376, 610, 268}

mean alpha and stddev

{{0.775849, 0.138502}, {0.813763, 0.159905}, {0.750582, 0.141186},
 {0.803521, 0.164122}, {0.797296, 0.161457}, {0.803018, 0.162621},
 {0.812034, 0.169823}, {0.80827, 0.164627}, {0.796985, 0.157804}, {0.795828, 0.160168}}

In[ ]:=
```
bin = 20;
norm = "Probability";
(*histogramy subdiff*)
subNTAdata = ParallelTable[
   Transpose[
    {Drop[HistogramList[Select[diameterstot[[i]], # < 1000 &], {bin}, norm][[1]], -1],
     HistogramList[Select[diameterstot[[i]], # < 1000 &], {bin}, norm][[2]]}], {i, 1, 10}];

(*dane z AFM*)
rawAFM =
  Import[NotebookDirectory[] <> "/AFM/AFM_rozmiary pęcherzyków z programu SPIP.xlsx"];
tmpAFMdata = {
   Table[rawAFM[[1, i, 5]], {i, 3, 2606, 1}],
   Table[rawAFM[[1, i, 8]], {i, 3, 2939, 1}], Table[rawAFM[[1, i, 11]], {i, 3, 4007, 1}]};
AFMdata = ParallelTable[Transpose[
    {Drop[HistogramList[Select[tmpAFMdata[[i]], # < 1000 &], {bin}, norm][[1]], -1],
     HistogramList[Select[tmpAFMdata[[i]], # < 1000 &], {bin}, norm][[2]]}], {i, 1, 3}];
For[i = 1, i ≤ 3, ++i, PrependTo[AFMdata[[i]], {bin, 0}]]
(*dane z liniowych fitów*)
linNTAdata = ParallelTable[Transpose[
    {Drop[HistogramList[Select[diamtrunclintot[[i]], # < 1000 &], {bin}, norm][[1]], -1],
     HistogramList[Select[diamtrunclintot[[i]], # < 1000 &], {bin}, norm][[2]]},
   {i, 1, 10}];
patnum =  {12, 29, 31, 200, 453, 2031, 20310, 4531, 4532, 4535};
tmpFTLA =
  Table[Import[NotebookDirectory[] <> "NTA_WARSZAWA/" <> ToString[patnum[[it]]] <>
     "/" <> ToString[patnum[[it]]] <> "_1-2-BATCH-summary.csv"], {it, 1, 10}];
FTLA = Table[ParallelTable[{tmpFTLA[[i, j, 1]],
     If[i ≤ 3, tmpFTLA[[i, j, 5]], Sum[tmpFTLA[[i, j, k]], {k, 2, 4}] / 3.0]},
    {j, If[i ≤ 5, 74, 78], If[i ≤ 5, Length[tmpFTLA[[i]]] - 1, 200]}], {i, 1, 10}];

(*GraphicsGrid[{Table[ListPlot[{linNTAdata[[i]],subNTAdata[[i]],AFMdata[[i]]},Joined→True,
     InterpolationOrder→2,PlotRange→{{0,400},{0,0.3}},AxesLabel→{"d[nm]",},
     PlotLegends→Placed[{"std. NTA","sub-diff. NTA", "AFM"},Scaled[{0.75,0.5}]]],
    {i,1,3}]},ImageSize→{800,250}]
 GraphicsGrid[{Table[
    ListPlot[{linNTAdata[[i]],subNTAdata[[i]],FTLA[[i]]},Joined→True,InterpolationOrder→2,
     PlotRange→{{0,1000},{0,0.3}},AxesLabel→{"d[nm]",},PlotLegends→
      Placed[{"std. NTA","sub-diff. NTA", "AFM"},Scaled[{0.75,0.5}]]],{i,4,7}],
   Table[ListPlot[{linNTAdata[[i]],subNTAdata[[i]],FTLA[[i]]},Joined→True,
     InterpolationOrder→2,PlotRange→{{0,1000},{0,0.3}},AxesLabel→{"d[nm]",},
     PlotLegends→Placed[{"std. NTA","sub-diff. NTA", "AFM"},Scaled[{0.75,0.5}]]],
    {i,8,10}]},ImageSize→{1000,500}]*)
```

(kernel 4)
```
Less::nord : Invalid comparison with ComplexInfinity attempted.
```

(kernel 4)
```
Less::nord : Invalid comparison with ComplexInfinity attempted.
```

```
dowykresu =
  Table[{Select[linNTAdata[[i]], #[[1]] ≤ 600 &], Select[subNTAdata[[i]], #[[1]] ≤ 600 &],
    Select[AFMdata[[i]], #[[1]] ≤ 600 &], Select[FTLA[[i]], #[[1]] < 600 &]}, {i, 1, 3}];
```

```
(*For[i=1,i≤3,++i,AppendTo[dowykresu[[i]],Select[FTLA[[i]],#[[1]]<600&]]];*)
maximal = Table[MaximalBy[dowykresu[[i, j]], Last][[1]], {i, 1, 3}, {j, 1, 4}];
dowykresu = Table[{dowykresu[[i, j, k, 1]], dowykresu[[i, j, k, 2]] / maximal[[i, j, 2]]},
   {i, 1, 3}, {j, 1, 4}, {k, 1, Length[dowykresu[[i, j]]]}];
m1 = Table[{{{Mean[Select[diameterstot[[i]], # < 1000 &]], 0.5}}, StandardDeviation[
    diameterstot[[i]]](*/Sqrt[Length[diameterstot[[i]]]*)}, {i, 1, 3}]
m2 = Table[{{{Mean[Select[diamtrunclintot[[i]], # < 1000 &]], 0.5}}, StandardDeviation[
    diamtrunclintot[[i]]](*/Sqrt[Length[diamtrunclintot[[i]]]*)}, {i, 1, 3}]
m3 = Table[{{{Mean[tmpAFMdata[[i]]], 0.5}}},
   StandardDeviation[tmpAFMdata[[i]]](*/Sqrt[Length[tmpAFMdata[[i]]]*)}, {i, 1, 3}]
m4 = Table[{{{Mean[WeightedData[Transpose[FTLA[[i]]][[1]], Transpose[FTLA[[i]]][[2]]]], 0.5}},
   StandardDeviation[WeightedData[Transpose[FTLA[[i]]][[1]], Transpose[FTLA[[i]]][[2]]]
   (*/Sqrt[Length[tmpAFMdata[[i]]]*)}, {i, 1, 3}]
histfinfit = Table[NonlinearModelFit[Drop[dowykresu[[i, j]] , 1],
   {a / x * Exp[- (Log[x] - m) ^2 / (2 s^2)]}, {{a, 1}, {m, 2}, {s, 0.8}}, x],
  {i, 1, 3}, {j, 1, 3(*Length[dowykresu[[i]]*)}]

figid = {"A", "B", "C", "D", "E", "F", "G", "H", "I", "J"};
(*GraphicsGrid[*){Table[Show[
   (*Plot[Evaluate[Table[histfinfit[[i,j]][x],{j,1,Length[histfinfit[[i]]]}]],
    {x,0,1000},PlotStyle→{{Red,Dashed},{Black,Dashed},{Blue,Dashed}},
    PlotRange→{{0,600},{0,1.3}},ImageSize→{500,300},LabelStyle→{20,Bold},
    PlotRangeClipping→True,AxesLabel→{"d[nm]",}],*)
   ListPlot[dowykresu[[i]](*{linNTAdata[[i]],subNTAdata[[i]],AFMdata[[i]]}*),
    Joined → {True, True, True}, InterpolationOrder → 0,
    PlotRange → {{0, 600}, {0, 1.3}}, LabelStyle → {20, Bold},
    PlotStyle → {{Red}, Black, {Blue, Dashed}, {Green, Thick}}, Filling → {2 → Axis},
    PlotLegends → Placed[{Style["lin. NTA", 15], Style["sub-diff. NTA", 15],
       Style["AFM", 15], Style["FTLA NTA", 15]}, Scaled[{0.95, 0.6}]],
    Epilog → Inset[Style[figid[[i]], 20, Bold], Scaled[{0.95, 0.95}]],
    ImageSize → {500, 300}, LabelStyle → {20, Bold},
    PlotRangeClipping → False, AxesLabel → {"d[nm]", "H(d)"}],
   ListPlot[{m2[[i, 1]], m1[[i, 1]], m3[[i, 1]], m4[[i, 1]]}, Filling → Axis,
    FillingStyle → {Opacity[1], Thickness[0.005]}, PlotStyle → {{Red, Thick},
      {Black, Thick}, {Blue, Thick}, {Green, Thick}}]], {i, 1, 3}]}(*]*)
MatrixForm[Table[{Exp[m - s^2], Exp[m + s^2 / 2]} /.
   histfinfit[[i, j]]["BestFitParameters"], {i, 1, 3}, {j, 1, 3}]]
tailfits = Table[NonlinearModelFit[Select[dowykresu[[i, j]], #[[1]] > maximal[[i, j, 1]] &],
    b * Exp[- (x - maximal[[i, j, 1]]) / a], {{a, 1}, {b, 1}}, x], {i, 1, 3}, {j, 1, 3}];
tailfits2 = Table[NonlinearModelFit[Select[dowykresu[[i, j]], #[[1]] > maximal[[i, j, 1]] &],
    {(b * Abs[x - c]) ^ (-1), a > 0, c > maximal[[i, j, 1]]},
    {{a, 1}, {b, 1}, {c, maximal[[i, j, 1]] + 1}}, x], {i, 1, 3}, {j, 1, 3}];
(*GraphicsGrid[*){Table[Show[
   Plot[Evaluate[Table[{(*tailfits[[i,j]][x],*)tailfits2[[i, j]][x]},
      {j, 1, Length[tailfits[[i]]]}]], {x, 20, 500},
    PlotStyle → {{Red, Dashed}, {Black, Dashed}, {Green, Dashed}},
    PlotRange → {{0, 500}, {0, 1.5}}, ImageSize → {500, 300},
    LabelStyle → {20, Bold}, PlotRangeClipping → False, AxesLabel → {"d[nm]",}],
   ListPlot[dowykresu[[i]](*{linNTAdata[[i]],subNTAdata[[i]],AFMdata[[i]]}*),
    Joined → {True, True, True}, InterpolationOrder → 0, PlotRange → {{0, 800}, {0, 1.5}},
```

```
    LabelStyle → {20, Bold}, PlotRangeClipping → False, PlotStyle → {Red, Black, Green},
    Filling → {2 → Axis}, PlotLegends → Placed[{Style["lin. NTA", 15],
       Style["sub-diff. NTA", 15], Style["AFM", 15]}, Scaled[{0.85, 0.6}]],
    Epilog → Inset[Style[figid[[i]], 20, Bold], Scaled[{0.95, 0.95}]]],
   ListPlot[{m2[[i, 1]], m1[[i, 1]], m3[[i, 1]]}, Filling → Axis, FillingStyle →
     {Opacity[1], Thickness[0.005]}, PlotStyle → {{Red, Thick}, {Black, Thick},
      {ColorData["Crayola"]["OliveGreen"], Thick}}]], {i, 1, 3}]}(*]*)
tailfits
tailfits2
```

```
{{{{223.979, 0.5}}, 293.986}, {{{155.475, 0.5}}, 263.989}, {{{143.402, 0.5}}, 189.124}}

{{{{400.246, 0.5}}, 360.678}, {{{285.075, 0.5}}, 341.309}, {{{278.458, 0.5}}, 263.823}}

{{{{73.6956, 0.5}}, 64.6948}, {{{66.0825, 0.5}}, 53.6164}, {{{66.7661, 0.5}}, 50.8991}}

{{{{193.241, 0.5}}, 88.479}, {{{160.74, 0.5}}, 80.6065}, {{{131.787, 0.5}}, 61.4111}}
```

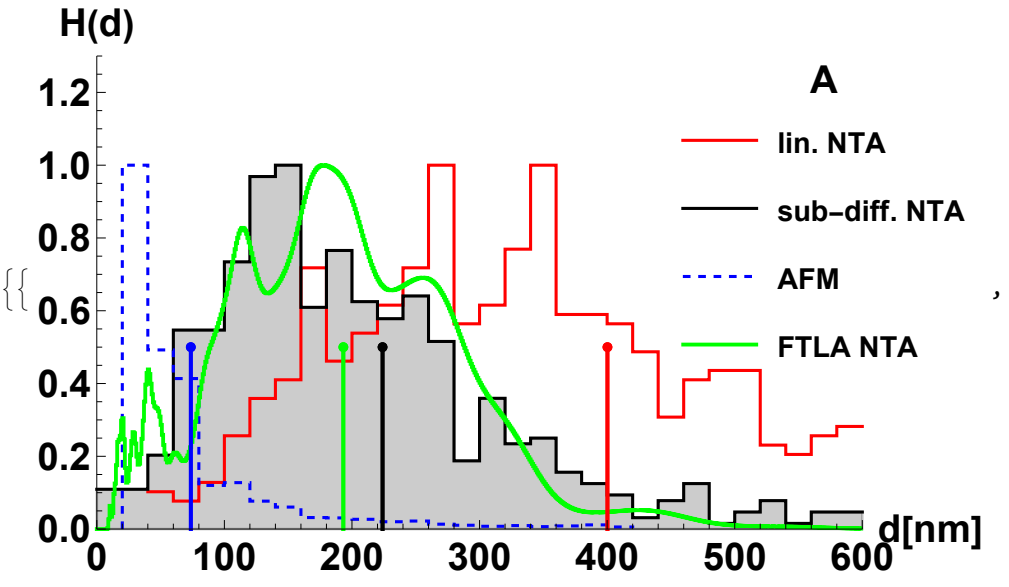
$$\left\{\left\{\text{FittedModel}\left[\frac{221.724\, e^{-1.51583\,(-\ll 17\gg+\ll 1\gg)^2}}{x}\right],\right.\right.$$

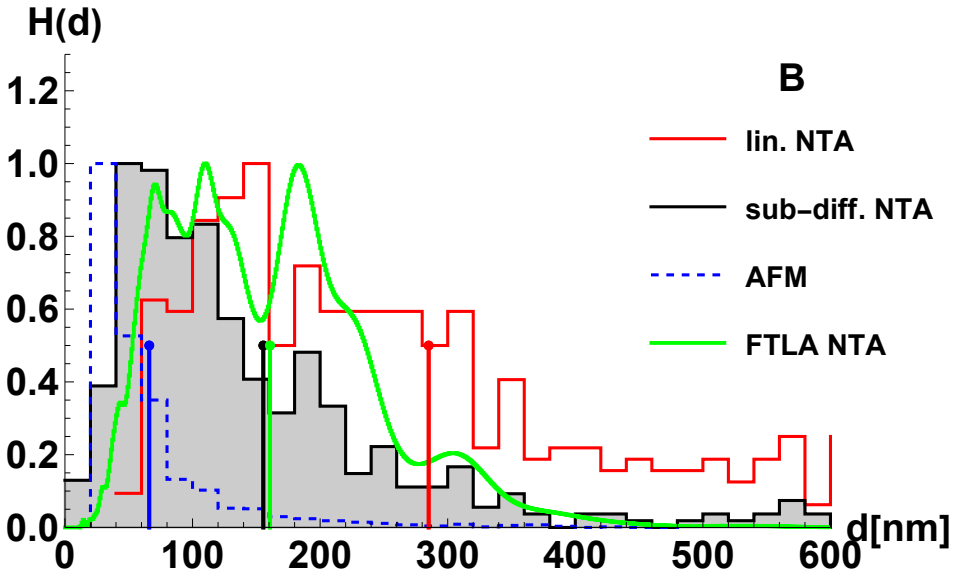
$$\text{FittedModel}\left[\frac{130.975\, e^{-1.35326\,(-\ll 18\gg+\ll 1\gg)^2}}{x}\right], \text{FittedModel}\left[\frac{21.8839\, e^{-0.431848\,(-\ll 19\gg+\ll 1\gg)^2}}{x}\right]\Big\},$$

$$\left\{\text{FittedModel}\left[\frac{133.053\, e^{-0.78085\,(-\ll 18\gg+\ll 1\gg)^2}}{x}\right], \text{FittedModel}\left[\frac{74.3068\, e^{-0.795672\,(-\ll 18\gg+\ll 1\gg)^2}}{x}\right],\right.$$

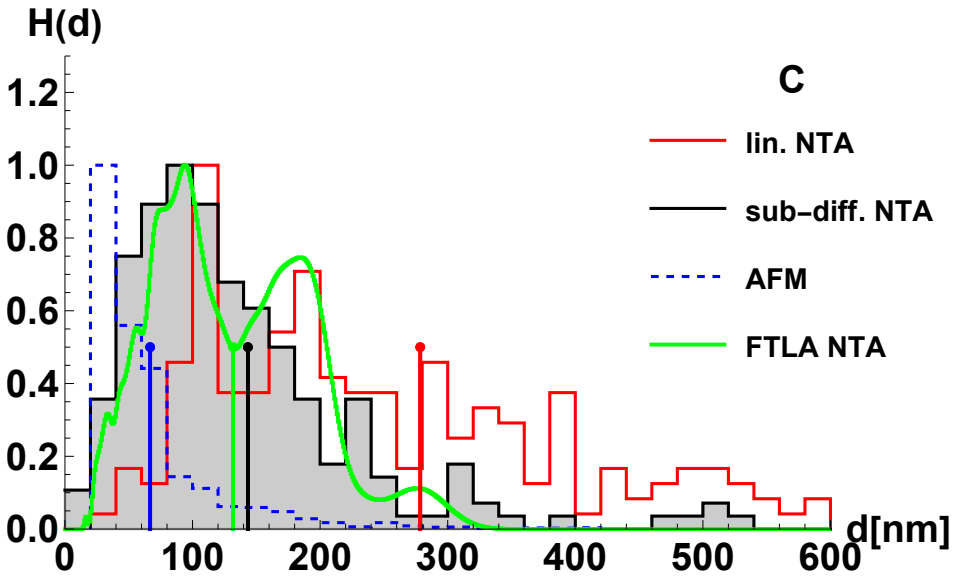
$$\text{FittedModel}\left[\frac{22.5451\, e^{-0.580126\,(-\ll 18\gg+\ll 1\gg)^2}}{x}\right]\Big\}, \left\{\text{FittedModel}\left[\frac{95.892\, e^{-0.96803\,(-\ll 18\gg+\ll 1\gg)^2}}{x}\right],\right.$$

$$\left.\left.\text{FittedModel}\left[\frac{83.7846\, e^{-0.992773\,(-\ll 18\gg+\ll 1\gg)^2}}{x}\right], \text{FittedModel}\left[\frac{24.2568\, e^{-0.609502\,(-\ll 19\gg+\ll 1\gg)^2}}{x}\right]\right\}\right\}$$





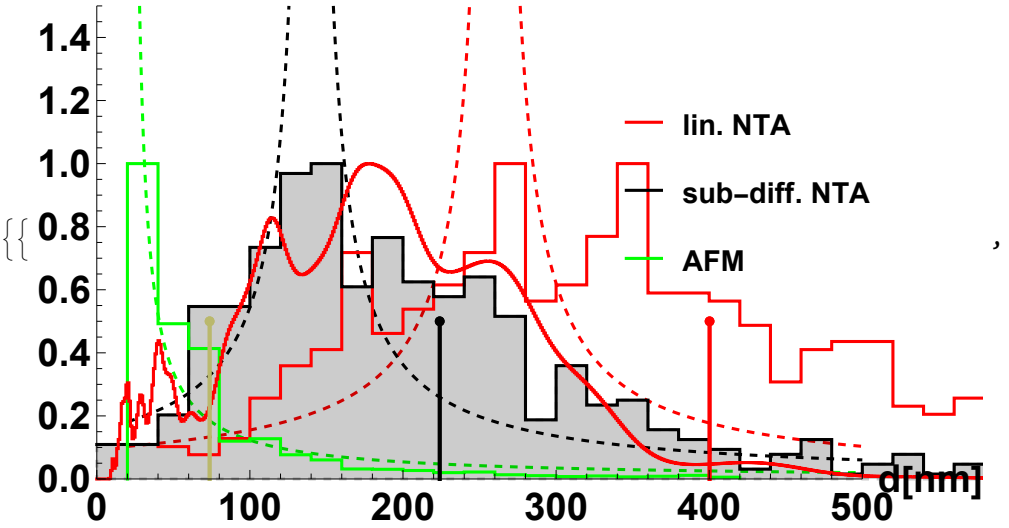
,



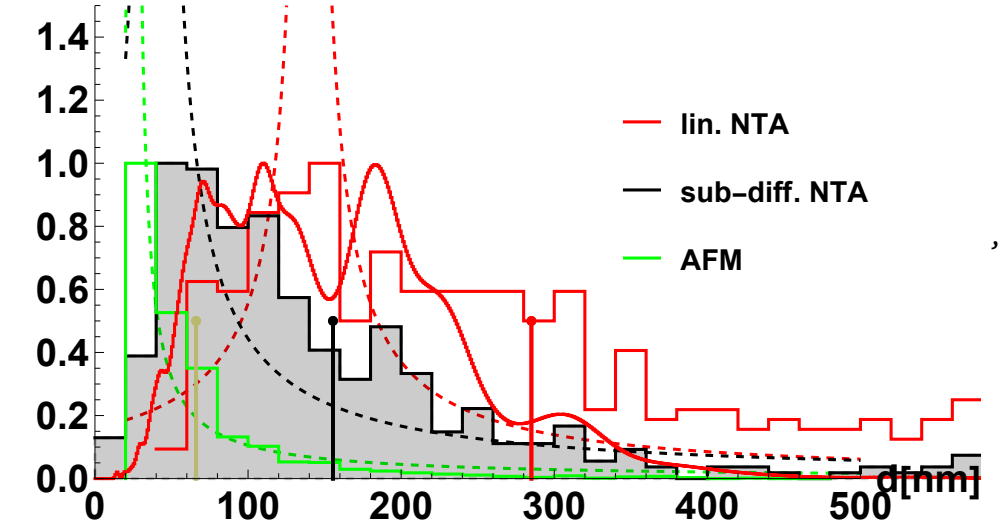
}}

$$\begin{pmatrix} \begin{pmatrix} 253.303 \\ 415.451 \end{pmatrix} & \begin{pmatrix} 123.866 \\ 215.599 \end{pmatrix} & \begin{pmatrix} 10.0296 \\ 56.9548 \end{pmatrix} \\ \begin{pmatrix} 117.441 \\ 306.871 \end{pmatrix} & \begin{pmatrix} 54.5744 \\ 140.073 \end{pmatrix} & \begin{pmatrix} 13.3545 \\ 48.6514 \end{pmatrix} \\ \begin{pmatrix} 129.165 \\ 280.301 \end{pmatrix} & \begin{pmatrix} 65.438 \\ 139.291 \end{pmatrix} & \begin{pmatrix} 15.5647 \\ 53.2776 \end{pmatrix} \end{pmatrix}$$

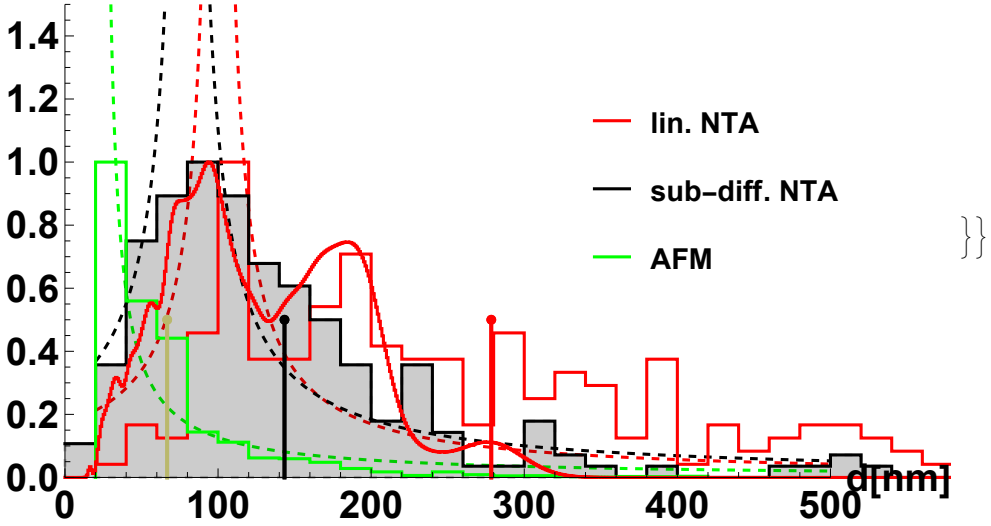
{{


1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
100
200
300
400
500
d[nm]
lin. NTA
sub−diff. NTA
AFM

,


1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
100
200
300
400
500
d[nm]
lin. NTA
sub−diff. NTA
AFM

,



}}

{{FittedModel[0.832565 e^0.00344202 (260−x)],
FittedModel[0.915927 e^0.00702985 (140−x)], FittedModel[0.818509 e^0.023099 (20−x)]},
{FittedModel[0.758021 e^0.00399365 (140−x)], FittedModel[1.20973 e^0.00918773 (40−x)],
FittedModel[0.92442 e^0.0273394 (20−x)]}, {FittedModel[0.582499 e^0.00373643 (100−x)],
FittedModel[1.14689 e^0.011868 (80−x)], FittedModel[0.970126 e^0.0252842 (20−x)]}}

{{FittedModel[24.8243 / Abs[−260. + x]], FittedModel[21.7646 / Abs[−140. + x]], FittedModel[9.64987 / Abs[−21.5089 + x]]},
{FittedModel[22.2258 / Abs[−140. + x]], FittedModel[26.6174 / Abs[−40. + x]], FittedModel[7.86089 / Abs[−25.5601 + x]]},
{FittedModel[16.9952 / Abs[−100. + x]], FittedModel[22.0649 / Abs[−80. + x]], FittedModel[9.69952 / Abs[−23.5217 + x]]}}

```
dowykresu2 = Table[{Select[linNTAdata[[i]], #[[1]] ≤ 1000 && #[[1]] ≥ 0 &],
    Select[subNTAdata[[i]], #[[1]] ≤ 1000 &], Select[FTLA[[i]], #[[1]] < 1000 &]}, {i, 4, 10}];
maximal2 = Table[MaximalBy[dowykresu2[[i, j]], Last][[1]], {i, 1, 7}, {j, 1, 3}];
dowykresu2 = Table[{dowykresu2[[i, j, k, 1]], dowykresu2[[i, j, k, 2]] / maximal2[[i, j, 2]]},
   {i, 1, 7}, {j, 1, 3}, {k, 1, Length[dowykresu2[[i, j]]]}];
m21 = Table[
  {{{Mean[WeightedData[Transpose[subNTAdata[[i]]][[1]], Transpose[subNTAdata[[i]]][[2]]],
     0.5}}, StandardDeviation[WeightedData[Transpose[subNTAdata[[i]]][[1]],
     Transpose[subNTAdata[[i]]][[2]]](*/Sqrt[Length[tmpAFMdata[[i]]]]*)}, {i, 4, 10}]
m22 = Table[
  {{{Mean[WeightedData[Transpose[linNTAdata[[i]]][[1]], Transpose[linNTAdata[[i]]][[2]]],
     0.5}}, StandardDeviation[WeightedData[Transpose[linNTAdata[[i]]][[1]],
     Transpose[linNTAdata[[i]]][[2]]](*/Sqrt[Length[tmpAFMdata[[i]]]]*)}, {i, 4, 10}]
m23 =
 Table[{{{Mean[WeightedData[Transpose[FTLA[[i]]][[1]], Transpose[FTLA[[i]]][[2]]], 0.5}},
   StandardDeviation[WeightedData[Transpose[FTLA[[i]]][[1]], Transpose[FTLA[[i]]][[2]]]
   (*/Sqrt[Length[tmpAFMdata[[i]]]]*)}, {i, 4, 10}]
histfinfit2 = Table[NonlinearModelFit[Drop[dowykresu2[[i, j]] , 1],
    {a / x * Exp[- (Log[x] - m) ^2 / (2 s^2)]}, {{a, 1}, {m, 2}, {s, 0.8}}, x],
   {i, 1, 7}, {j, 1, 2(*Length[dowykresu[[i]]]*)}];
MatrixForm[Table[{Exp[m - s^2], Exp[m + s^2 / 2]} /.
   histfinfit2[[i, j]]["BestFitParameters"], {i, 1, 7}, {j, 1, 2}]]
Table[MaximalBy[dowykresu2[[i, 3]], Last][[1]], {i, 1, 7}]
labels = {"PS_W 203nm dil. 8*10^3", "PS_W 453nm dil. 5*10^3",
  "PS_K 203nm dil. 10^3", "PS_K 203nm dil. 10^4", "PS_K 453nm dil. 10^3",
  "PS_K 453nm dil. 2*10^3", "PS_K 453nm dil. 5*10^3"}
GraphicsGrid[Table[If[2 k + l ≠ 8, Show[
    Plot[Evaluate[Table[histfinfit2[[2 k + l, j]][x], {j, 1, 2}]],
     {x, 0, 1000}, ImageSize → {500, 300}, PlotRange → {All, {0, 1.5}},
     PlotStyle → {{Red, Dashed}, {Black, Dashed}}, LabelStyle → {20, Bold},
     AxesLabel → {"d[nm]", "H(d)"}, PlotRangeClipping → False,
     Epilog → {Inset[Style[figid[[2 k + l]], 20, Bold], Scaled[{1.05, 0.95}]],
       Inset[Style[labels[[2 k + l]], 15, Bold], Scaled[{.5, 0.95}]]}],
    ListPlot[dowykresu2[[2 k + l]], Joined → True, PlotRange → All, InterpolationOrder → 0,
     PlotStyle → {{Thick, Red}, {Thick, Black}, {Thick, Green}},
     Filling → {2 → Axis}, LabelStyle → {20, Bold},
     PlotLegends → Placed[{Style["lin. NTA", 15], Style["sub-diff. NTA", 15],
        Style["FTLA NTA", 15]}, Scaled[{0.9, 0.6}]], PlotRangeClipping → False],
    ListPlot[{m22[[2 k + l, 1]], m21[[2 k + l, 1]], m23[[2 k + l, 1]]},
     Filling → Axis, FillingStyle → {Opacity[1], Thickness[0.005]},
     PlotStyle → {{Red, Thick}, {Black, Thick}, {Green, Thick}}]
   ]], {k, 0, 3}, {l, 1, 2}], ImageSize → {1000, 1200}, AspectRatio → Full]
```

```
{{{{200.304, 0.5}}, 133.463}, {{{364.072, 0.5}}, 162.048},
 {{{199.831, 0.5}}, 158.765}, {{{192.507, 0.5}}, 137.825}, {{{323.283, 0.5}}, 189.993},
 {{{338.038, 0.5}}, 191.171}, {{{347.574, 0.5}}, 173.915}}
```

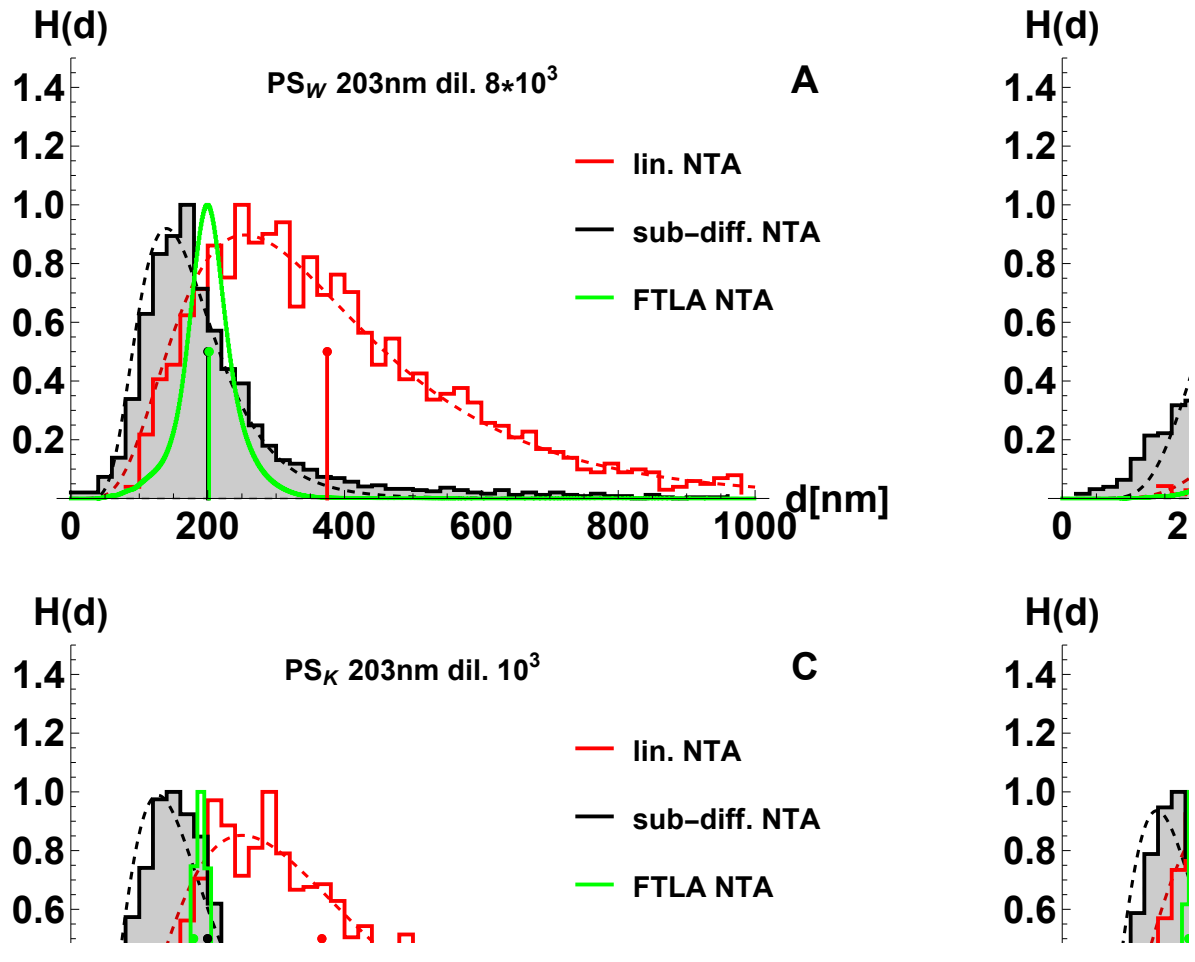
```
{{{{374.707, 0.5}}, 187.549}, {{{598.455, 0.5}}, 199.623},
 {{{366.907, 0.5}}, 271.759}, {{{354.024, 0.5}}, 479.632}, {{{541.714, 0.5}}, 209.251},
 {{{539.603, 0.5}}, 207.878}, {{{588.592, 0.5}}, 199.533}}
```

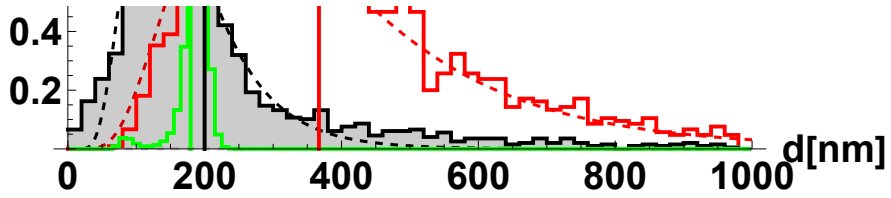
```
{{{{202.133, 0.5}}, 47.0328}, {{{450.272, 0.5}}, 85.7774},
 {{{179.392, 0.5}}, 25.4214}, {{{185.02, 0.5}}, 19.0813}, {{{307.985, 0.5}}, 112.077},
 {{{348.539, 0.5}}, 82.9946}, {{{367.131, 0.5}}, 71.657}}
```

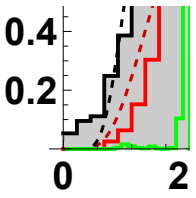
$$\begin{pmatrix} \begin{pmatrix} 254.004 \\ 397.776 \end{pmatrix} & \begin{pmatrix} 139.704 \\ 177.136 \end{pmatrix} \\ \begin{pmatrix} 527.516 \\ 751.517 \end{pmatrix} & \begin{pmatrix} 298.777 \\ 368.478 \end{pmatrix} \\ \begin{pmatrix} 250.305 \\ 386.516 \end{pmatrix} & \begin{pmatrix} 127.301 \\ 173.308 \end{pmatrix} \\ \begin{pmatrix} 242.613 \\ 375.967 \end{pmatrix} & \begin{pmatrix} 138.425 \\ 173.289 \end{pmatrix} \\ \begin{pmatrix} 473.817 \\ 692.711 \end{pmatrix} & \begin{pmatrix} 236.799 \\ 407.332 \end{pmatrix} \\ \begin{pmatrix} 455.469 \\ 654.171 \end{pmatrix} & \begin{pmatrix} 244.817 \\ 367.892 \end{pmatrix} \\ \begin{pmatrix} 504.044 \\ 646.212 \end{pmatrix} & \begin{pmatrix} 293.39 \\ 338.345 \end{pmatrix} \end{pmatrix}$$

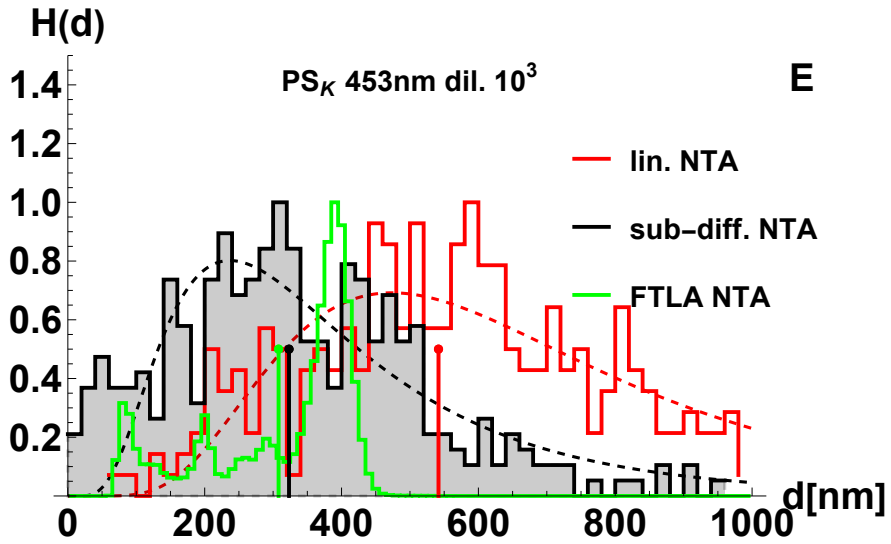
```
{{199, 1.}, {459, 1.}, {185., 1.}, {185., 1.}, {385., 1.}, {395., 1.}, {395., 1.}}
```

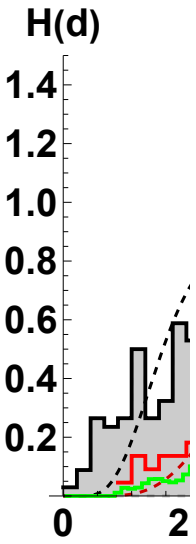
$\{PS_W$ 203nm dil. $8*10^3$, PS_W 453nm dil. $5*10^3$, PS_K 203nm dil. 10^3,
PS_K 203nm dil. 10^4, PS_K 453nm dil. 10^3, PS_K 453nm dil. $2*10^3$, PS_K 453nm dil. $5*10^3\}$

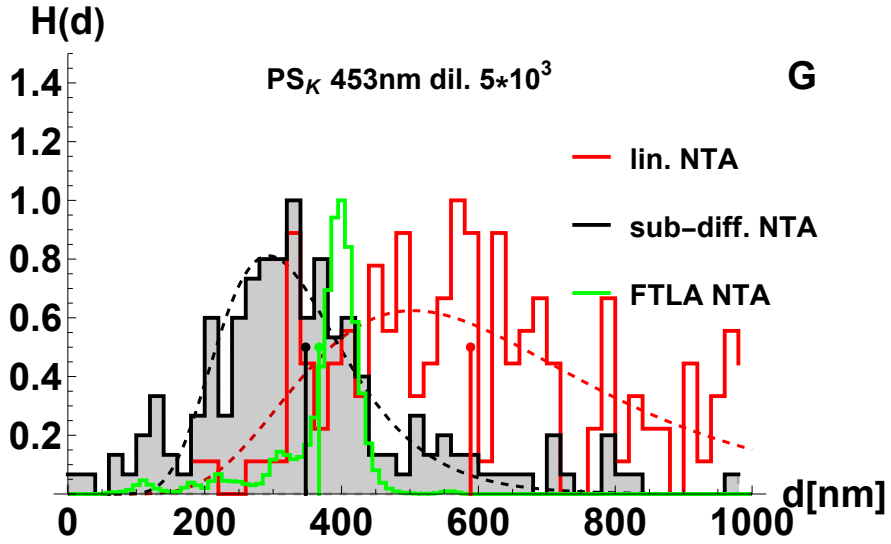



0.4
0.2
0
200
400
600
800
1000
d[nm]


0.4
0.2
0
2


H(d)
PS$_K$ 453nm dil. 10^3
E
lin. NTA
sub−diff. NTA
FTLA NTA
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
200
400
600
800
1000
d[nm]


H(d)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
2


H(d)
PS$_K$ 453nm dil. 5*10^3
G
lin. NTA
sub−diff. NTA
FTLA NTA
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
200
400
600
800
1000
d[nm]