In[1]:=

```
Remove["Global`*"]

(*Inputs*)
filelist = {3, 121, 143, 145, 147, 199, 201, 203, 205};
inputpath = "d:\\test\\";
rescaleV = 100;
rescaleI = 10 000;
zeroposition = 0;

outputpath = inputpath <> "Edited\\";
CreateDirectory[outputpath];
Is = {};

(*Main cycle going through filelist*)
Do[
  Print["\nFile:", k];

  (*Load file with IV (current-voltage characteristics). Format -
   4 columns. Column N2 - voltage, column N4 - current. N1,N3 - time. *)
  file = "iv" <> ToString[k];
  rawdata = Map[{N[#[[2]] / rescaleV], N[#[[4]] / rescaleI]} &,
    Import[inputpath <> ToString[file] <> ".txt", "Table"]];

  (*----SHIFT VERTICAL----*)
  (*Select the central part of IV to find max/min
    Y values (current) for centering. We need selecting of middle -
   to exclude end parts of IV, that could be higher than central part *)
  selectData = {};
  leftX = -1 * 10^-4; rightX = 1 * 10^-4;
  For [ i = 1, i ≤ Length[rawdata],
   i++, If[rawdata[[i, 1]] ≥ leftX && rawdata[[i, 1]] ≤ rightX,
    AppendTo[selectData, rawdata[[i]]] ]];

  (*Find min/max Y*)
  minY = Min[selectData[[All, 2]]];
  maxY = Max[selectData[[All, 2]]];
  Isw[k] = (Abs[maxY] + Abs[minY]) / 2;
  AppendTo[Is, {Isw[k], k}];
  Print["Max Y=", maxY, "; Min Y=", minY, "; Isw(uA)=", Isw[k] * 10^6];

  (*Shift along Y axis to symmetrical position*)
  yshiftData = {};
  shiftY = zeroposition - (maxY + minY) / 2;
  For [ i = 1, i ≤ Length[rawdata], i++, AppendTo[yshiftData, rawdata[[i]] + {0, shiftY}]];

  (*----SHIFT HORISONTAL----*)
  (*Select part of Y-shifted data, that has near zero Y values. We need this to find
   min/max X values (voltage) exactly in the central part of IV, for centering by X*)
  selectData = {};
  minY2 = -0.5 * 10^-6; maxY2 = 0.5 * 10^-6;
```

```
  For[i = 1, i ≤ Length[yshiftData], i++,
   If[yshiftData[[i, 2]] ≥ minY2 && yshiftData[[i, 2]] ≤ maxY2,
    AppendTo[selectData, yshiftData[[i]]]];

  (*Find min/max X*)
  minX = Min[selectData[[All, 1]]];
  maxX = Max[selectData[[All, 1]]];
  Print["Max X=", maxX, "; Min X=", minX];

  (*Shift along X to symmetrical position*)
  xyshiftData = {};
  shiftX = zeroposition - (maxX + minX) / 2;
  For[i = 1, i ≤ Length[yshiftData],
   i++, AppendTo[xyshiftData, yshiftData[[i]] + {shiftX, 0}]];

  (*Convert IV to RI (resistance-current) presentation*)
  riData = Map[{N[#[[2]]], N[#[[1]] / #[[2]]]} &, xyshiftData];

  (*Export*)
  Export[outputpath <> ToString[file] <> "_rescaled.dat",
   Map[{N[#[[1]]], N[#[[2]]]} &, rawdata]];
  Export[outputpath <> ToString[file] <> "_shifted.dat",
   Map[{N[#[[1]]], N[#[[2]]]} &, xyshiftData]];
  Export[outputpath <> ToString[file] <> "_RI.dat", Map[{N[#[[1]]], N[#[[2]]]} &, riData]],

  {k, filelist}
 ];

(*Export list of switching currents*)
Export[outputpath <> "Isw" <>
   ToString[First[filelist]] <> "-" <> ToString[Last[filelist]] <> ".dat", Is];

(*Overall list that will include all IV and RI data sets*)
ivAll = {};
riAll = {};
(*Import of shifted IVs *)
For[i = 1, i <= Length[filelist], i++,
 iv[i] = Map[{#[[1]], #[[2]]} &,
   Import[outputpath <> "iv" <> ToString[filelist[[i]]] <> "_shifted.dat", "Table"]];
 ri[i] = Map[{#[[1]], #[[2]]} &, Import[
    outputpath <> "iv" <> ToString[filelist[[i]]] <> "_RI.dat", "Table"]];
 AppendTo[ivAll, iv[i]];
 AppendTo[riAll, ri[i]];
]

ListPlot[ivAll]
ListPlot[riAll]
```

Remove::rmnsm : There are no symbols matching "Global`*". ≫

File:3

Max Y=0.0000418029; Min Y=-0.0000441184; Isw(uA)=42.9607

Max X=0.0000592009; Min X=0.0000392175

File:121

Max Y=0.000040419; Min Y=-0.0000437038; Isw(uA)=42.0614

Max X=0.0000619487; Min X=0.0000442134

File:143

Max Y=0.0000395397; Min Y=-0.0000429194; Isw(uA)=41.2296

Max X=0.0000377188; Min X=0.0000333474

File:145

Max Y=0.0000386904; Min Y=-0.0000418578; Isw(uA)=40.2741

Max X=0.0000403416; Min X=0.0000342217

File:147

Max Y=0.0000368406; Min Y=-0.0000402527; Isw(uA)=38.5467

Max X=0.0000389677; Min X=0.0000350959

File:199

Max Y=0.0000347186; Min Y=-0.0000379222; Isw(uA)=36.3204

Max X=0.0000379685; Min X=0.0000337221

File:201

Max Y=0.0000313064; Min Y=-0.0000346412; Isw(uA)=32.9738

Max X=0.0000360951; Min X=0.0000323482

File:203

Max Y=0.0000214471; Min Y=-0.0000248556; Isw(uA)=23.1513

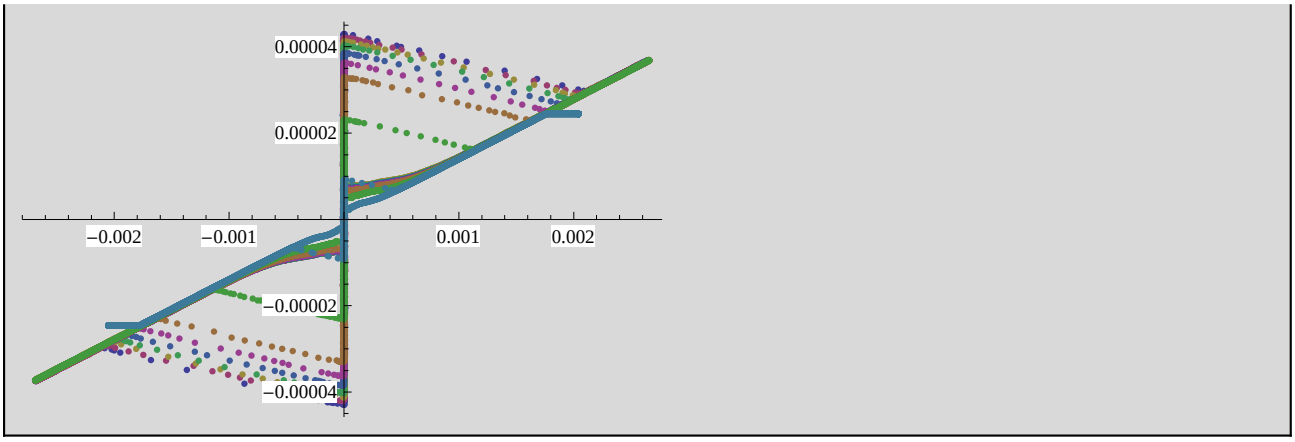
Max X=0.0000375939; Min X=0.0000323482

File:205

Max Y=7.51102×10^{-6}; Min Y=-0.0000109409; Isw(uA)=9.22598

Max X=0.0000361576; Min X=0.000032598

Out[15]=



Out[16]=