

```
In[1]:= ClearAll["Global`*"]
SetDirectory[
  "/Users/humayrajeba/Documents/Wolfram Mathematica/processed_data_dBm"];
data = Import["updated_vr_7.txt", "Table"];
micromobility = data[[All, 2]];
SetDirectory["/Users/humayrajeba/Documents/Wolfram Mathematica/THzBlock"];
data = Import["Set3_H=135cm_L13=450cm_L12=300cm/DATA_UNCAL_Meas22", "Table"];
avgParam = 20;
percentage = 5;
blockage = data[[All, 2]];

In[2]:= micromobility
blockage
```

Out[1]=

```
{-14.4117, -14.3996, -14.3835, -14.3656, -14.3553, -14.3586, -14.3704, -14.3823,
-14.3973, -14.4074, -14.4113, -14.4081, ... 299 977 ..., -26.8073, -26.7997, -26.7936,
-26.7935, -26.7993, -26.8047, -26.8185, -26.8037, -26.8055, -26.7935, -26.7843, -26.7969}
```

Full expression not available (original memory size: 7.2 MB)



Out[2]=

```
2.35756×10-6, 2.35756×10-6, 2.35756×10-6, 2.35756×10-6, 2.35756×10-6, 2.21344×10-6, 2.35756×10-6,
2.21344×10-6, 2.21344×10-6, 2.35756×10-6, 2.21344×10-6, 2.35756×10-6, 2.35756×10-6,
2.21344×10-6, 2.21344×10-6, 2.35756×10-6, 2.50167×10-6, 2.7899×10-6, ... 79 964 ... ,
6.10451×10-6, 6.10451×10-6, 5.9604×10-6, 5.81629×10-6, 5.67217×10-6, 5.38394×10-6,
5.38394×10-6, 5.23983×10-6, 5.23983×10-6, 5.23983×10-6, 5.09572×10-6, 5.09572×10-6,
4.9516×10-6, 4.9516×10-6, 4.9516×10-6, 4.80749×10-6, 4.80749×10-6, 4.80749×10-6}
```

Full expression not available (original memory size: 1.9 MB)



```
In[3]:= (*Calculate the weighted signal and its exponential moving average*)
block1 = 10 * Log10[blockage]
```

Out[3]=

```
{-56.2754, -56.2754, -56.2754, -56.2754, -56.2754, -56.5493, -56.2754, -56.5493, -56.5493,
-56.2754, -56.5493, -56.2754, -56.2754, ... 79 974 ..., -52.689, -52.689, -52.8068, -52.8068,
-52.8068, -52.9279, -52.9279, -53.0525, -53.0525, -53.0525, -53.1808, -53.1808, -53.1808}
```

Full expression not available (original memory size: 1.9 MB)



```
In[4]:= micro1 = Take[micromobility]
```

Out[4]=

```
{-14.4117, -14.3996, -14.3835, -14.3656, -14.3553, -14.3586, -14.3704, -14.3823,
-14.3973, -14.4074, -14.4113, -14.4081, ... 299 977 ..., -26.8073, -26.7997, -26.7936,
-26.7935, -26.7993, -26.8047, -26.8185, -26.8037, -26.8055, -26.7935, -26.7843, -26.7969}
```

Full expression not available (original memory size: 7.2 MB)



```
In[=]:= microPeriodogram = PeriodogramArray@micro1
ListLinePlot[micro1, PlotRange -> All]
```

```
blockPeriodogram = PeriodogramArray@block1
ListLinePlot[block1 + 35, PlotRange -> All]
```

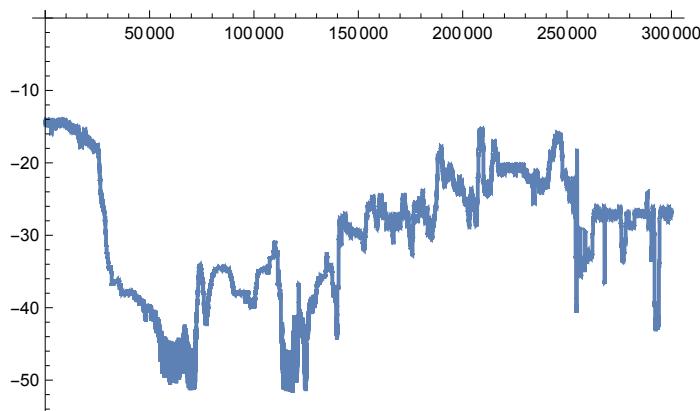
Out[=]=

$\{2.70143 \times 10^8, 6.15842 \times 10^6, 844\ 002., 972\ 400., 1.78102 \times 10^6, 325\ 392., 32\ 524.6, 182\ 382., 87\ 063.2,$   
 $191\ 726., 74\ 345.9, 232\ 978., 18\ 204.6, \dots 299\ 975 \dots, 21\ 622.2, 18\ 204.6, 232\ 978., 74\ 345.9,$   
 $191\ 726., 87\ 063.2, 182\ 382., 32\ 524.6, 325\ 392., 1.78102 \times 10^6, 972\ 400., 844\ 002., 6.15842 \times 10^6\}$

Full expression not available (original memory size: 2.4 MB )



Out[=]=



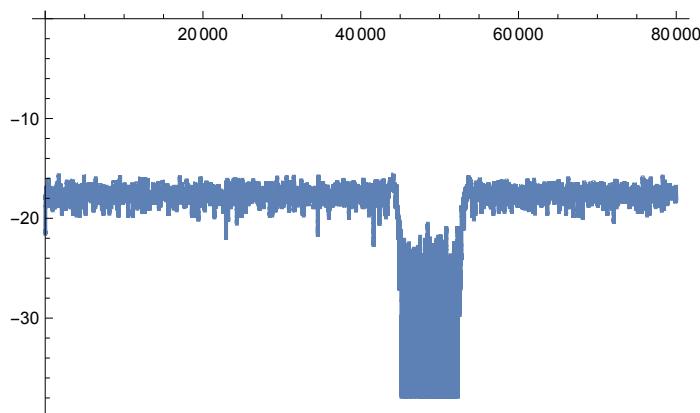
Out[=]=

$\{2.30049 \times 10^8, 76\ 480.3, 71\ 028., 60\ 399.1, 47\ 904.4, 35\ 121.7, 23\ 885.7, 14\ 186.5, 6382.24,$   
 $2808.34, 619.054, 178.768, 560.247, \dots 79\ 974 \dots, 2232.03, 957.728, 398.313, 450.223,$   
 $2182.64, 5337.34, 12\ 624.6, 21\ 985.1, 33\ 205.7, 46\ 336.8, 59\ 118.4, 69\ 809.5, 75\ 610.8\}$

Full expression not available (original memory size: 0.6 MB )



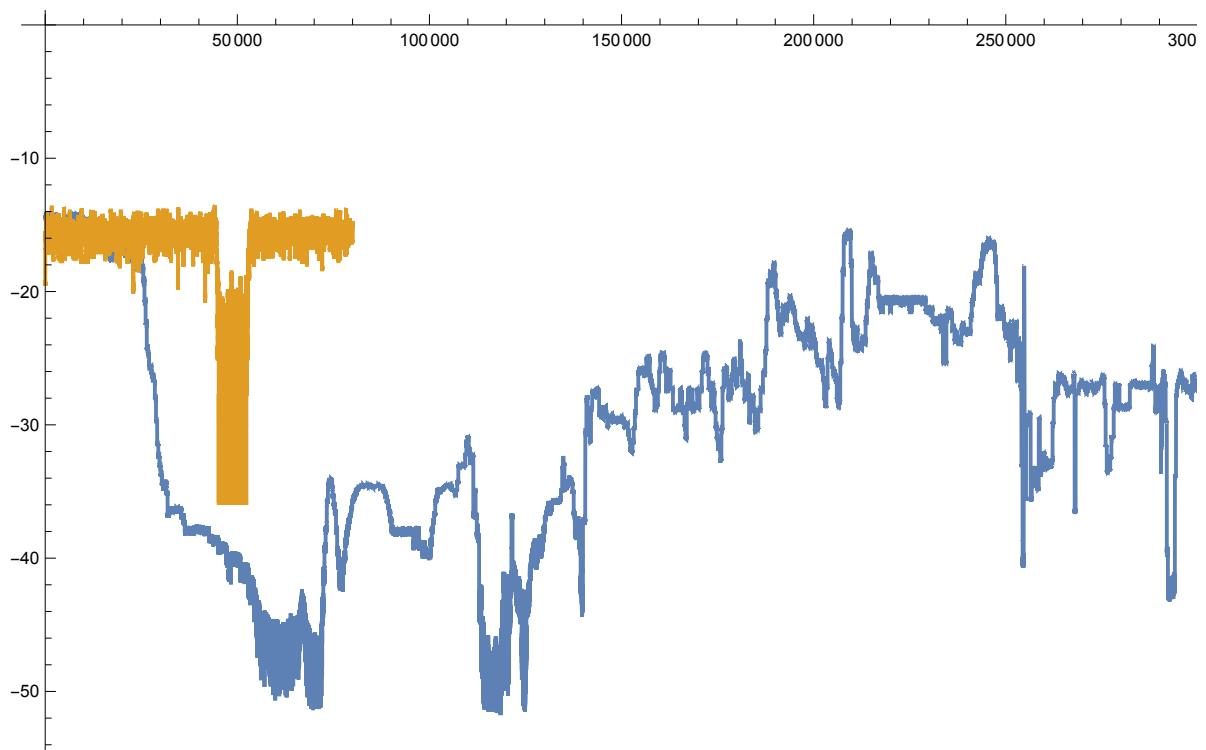
Out[=]=



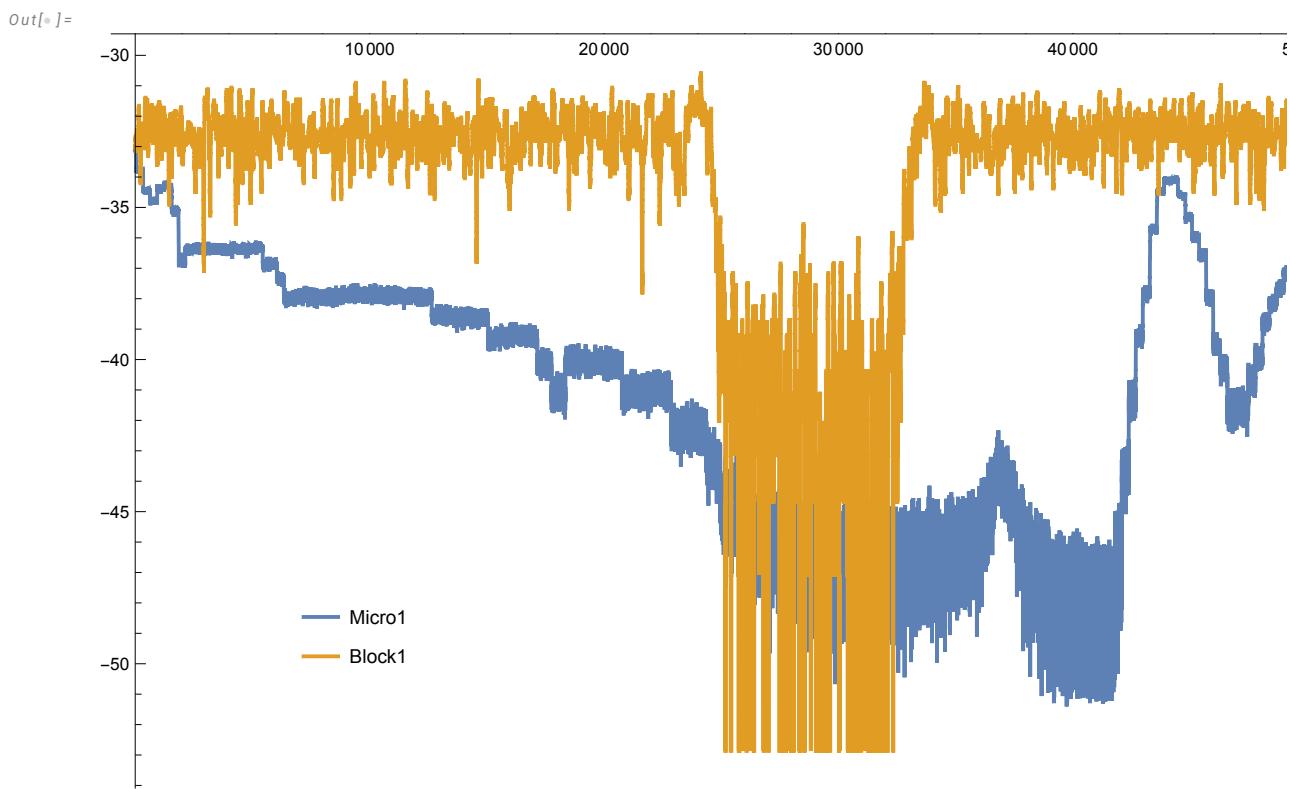
```
In[=]:= microPeriodogram = PeriodogramArray[micro1];
blockPeriodogram = PeriodogramArray[block1];

ListLinePlot[{micro1, block1 + 37},
PlotRange → All, PlotLegends → {"Micro1", "Block1"}]
```

Out[=]=



```
In[4]:= ListLinePlot[{micro1[[30000 ;; 80000]], block1[[20000 ;; 70000]] + 20},
  PlotRange -> All, PlotStyle -> {Blue, Gray},
  PlotLegends -> Placed[{"Micro1", "Block1"}, {0.2, 0.2}]]
```



```
In[5]:= block = block1 + 35
decayRate1 = 0.001;
movingAvg1 = Re[ExponentialMovingAverage[block, decayRate1]]
ListLinePlot[movingAvg1, PlotRange -> All]
decayRate2 = 0.0001;
movingAvg2 = Re[ExponentialMovingAverage[block, decayRate2]]
ListLinePlot[movingAvg2, PlotRange -> All]
```

Out[5]=

```
{-21.2754, -21.2754, -21.2754, -21.2754, -21.2754, -21.5493, -21.2754, -21.5493,
-21.5493, -21.2754, -21.5493, -21.2754, ... 79.976 ..., -17.689, -17.8068, -17.8068,
-17.8068, -17.9279, -17.9279, -18.0525, -18.0525, -18.0525, -18.1808, -18.1808, -18.1808}
```

Full expression not available (original memory size: 1.9 MB )



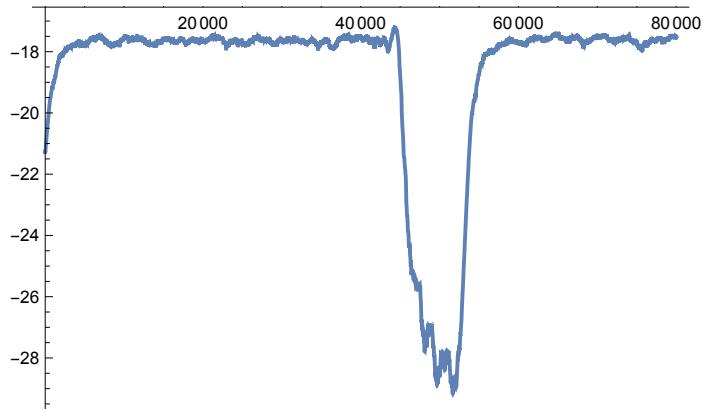
Out[5]=

```
{-21.2754, -21.2754, -21.2754, -21.2754, -21.2754, -21.2757, -21.2757, -21.2759, -21.2762,
-21.2762, -21.2765, -21.2765, -21.2765, ... 79.975 ..., -17.5124, -17.5127, -17.513,
-17.5133, -17.5137, -17.5142, -17.5147, -17.5152, -17.5158, -17.5164, -17.5171, -17.5178}
```

Full expression not available (original memory size: 1.9 MB )



Out[=]



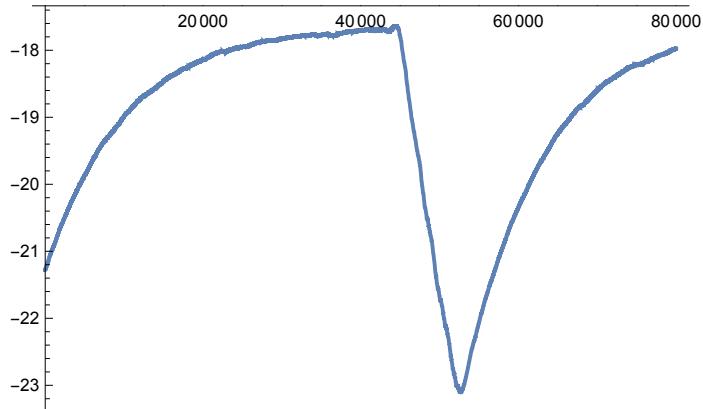
Out[=]

```
{-21.2754, -21.2754, -21.2754, -21.2754, -21.2754, -21.2754, -21.2754, -21.2754, -21.2755,
-21.2755, -21.2755, -21.2755, -21.2755, ... 79975 ..., -17.9727, -17.9727, -17.9727,
-17.9726, -17.9726, -17.9726, -17.9726, -17.9727, -17.9727, -17.9727, -17.9727, -17.9727}
```

Full expression not available (original memory size: 1.9 MB )



Out[=]



```
In[6]:= movingAvg3 = Re[ExponentialMovingAverage[micromobility, decayRate1]]
ListLinePlot[movingAvg3, PlotRange -> All]
movingAvg4 = Re[ExponentialMovingAverage[micromobility, decayRate2]]
ListLinePlot[movingAvg4, PlotRange -> All]
```

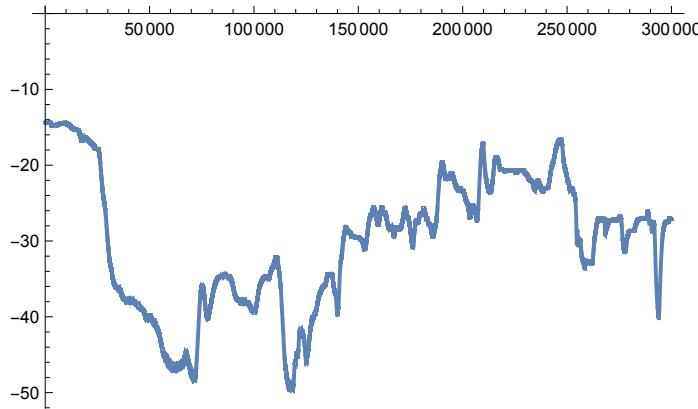
Out[6]=

```
{-14.4117, -14.4117, -14.4117, -14.4116, -14.4116, -14.4115, -14.4115, -14.4115,
-14.4114, -14.4114, -14.4114, -14.4114, ... 299.977 ..., -27.0369, -27.0366, -27.0364,
-27.0361, -27.0359, -27.0357, -27.0355, -27.0352, -27.035, -27.0348, -27.0345, -27.0343}
```

Full expression not available (original memory size: 2.4 MB )



Out[6]=



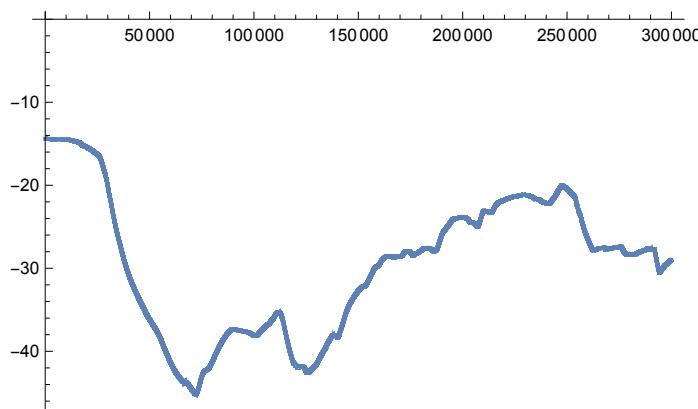
Out[6]=

```
{-14.4117, -14.4117, -14.4117, -14.4117, -14.4117, -14.4117, -14.4117, -14.4117,
-14.4117, -14.4117, -14.4117, -14.4117, ... 299.977 ..., -28.9833, -28.9831, -28.9829,
-28.9827, -28.9824, -28.9822, -28.982, -28.9818, -28.9816, -28.9814, -28.9811, -28.9809}
```

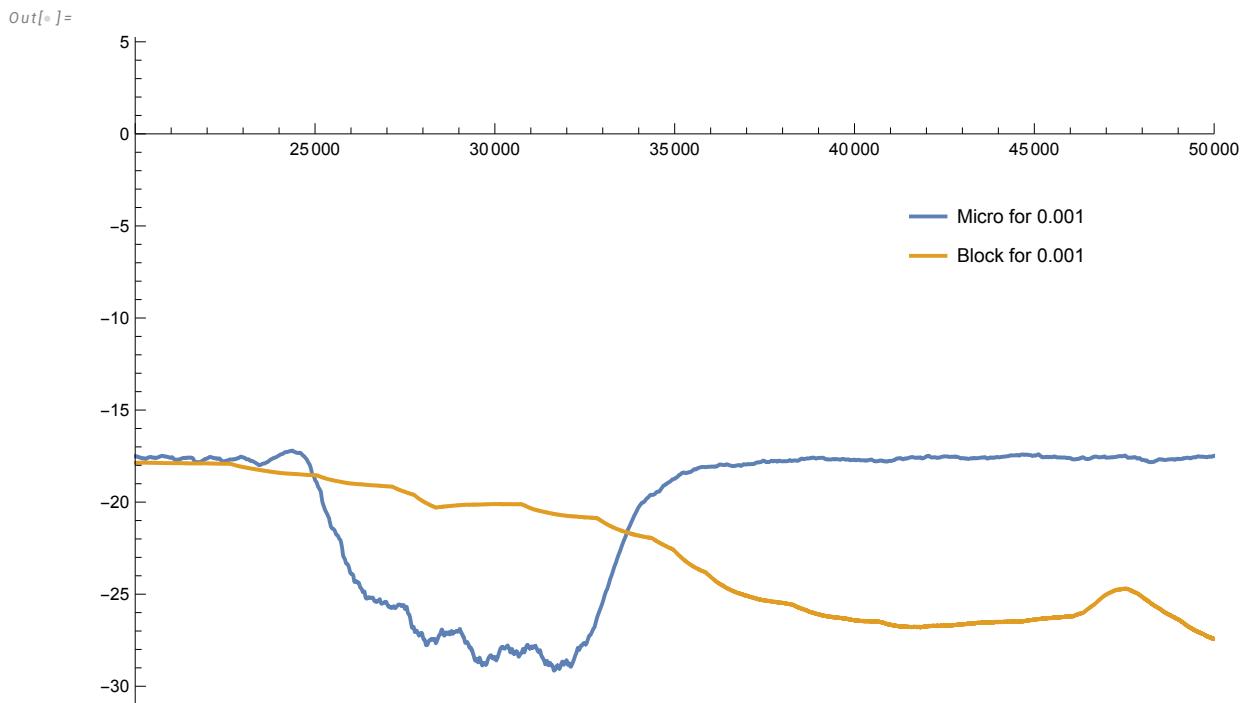
Full expression not available (original memory size: 2.4 MB )



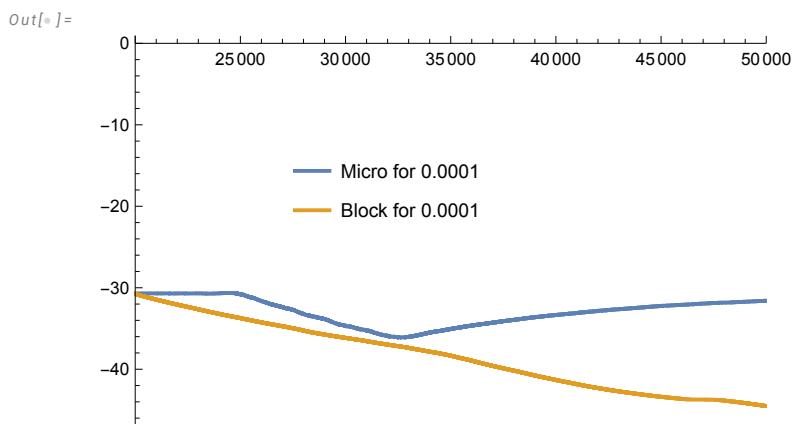
Out[6]=



```
In[8]:= ListLinePlot[{movingAvg1[[20 000 ;; 70 000]], movingAvg3[[20 000 ;; 70 000]] + 20},
  PlotRange -> {{20 000, 50 000}, All}, PlotStyle -> {BlueGray},
  PlotLegends -> Placed[{"Micro for 0.001", "Block for 0.001"}, {0.8, 0.7}]]
```



```
In[9]:= ListLinePlot[{movingAvg2[[20 000 ;; 70 000]] - 13, movingAvg4[[20 000 ;; 70 000]]},
  PlotRange -> {{20 000, 50 000}, All}, PlotStyle -> {BlueGray},
  PlotLegends -> Placed[{"Micro for 0.0001", "Block for 0.0001"}, {0.4, 0.6}]]
```



```
In[=]:= (*Initialize the list to store the sum of periodograms without decay rate*)
sumPeriodograms = {};

(*Calculate the number of segments*)
numSegments = Quotient[Length[block], 500];

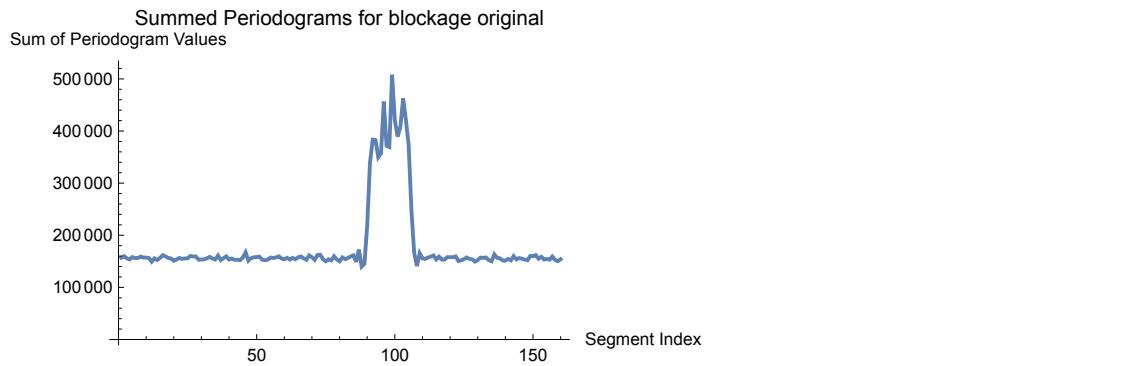
(*Loop through each segment*)
For[i = 1, i ≤ numSegments, i++,
  (*Extract the i^th segment of 500 values*)
  blockSegment = Take[block, {500 * (i - 1) + 1, 500 * i}];
  (*Compute the periodogram for the current segment*)
  periodogram = PeriodogramArray[blockSegment];
  (*Sum up the values of the periodogram*)
  sumPeriodogram = Total[periodogram];
  (*Append the sum to the list*)
  AppendTo[sumPeriodograms, sumPeriodogram];]

(*Output the list of summed periodograms for blockage trace*)
sumPeriodograms

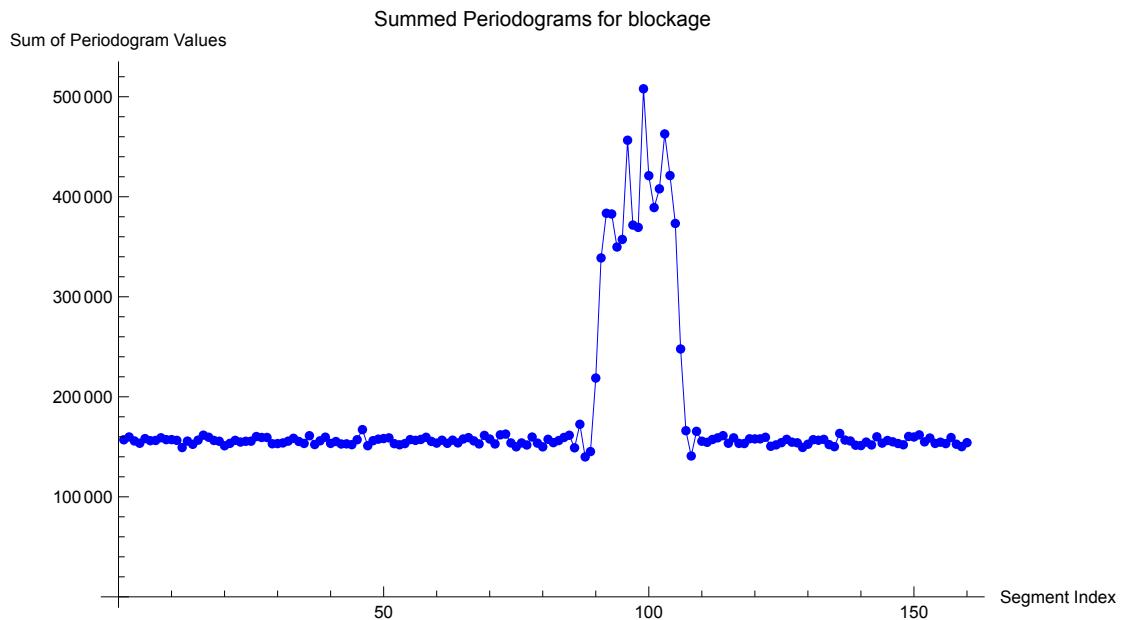
Out[=]= {156999., 159843., 155849., 153551., 158178., 156125., 156326., 159035.,
157153., 157208., 156418., 149249., 155707., 152467., 156637., 161624.,
159546., 156356., 155529., 151034., 153419., 156424., 154742., 155509.,
155609., 160251., 159306., 159335., 153034., 153201., 153846., 155668.,
158504., 155335., 153345., 161077., 152272., 155984., 159612., 153391.,
155270., 152797., 152931., 152132., 157041., 167167., 151092., 156117.,
157649., 158272., 158941., 153130., 152008., 153188., 157202., 156422.,
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162691., 153864., 149983., 153853., 151807., 159749., 153673., 149952.,
157470., 154153., 156199., 159331., 161516., 148977., 172525., 139896.,
145235., 218742., 338821., 383502., 382763., 349751., 357320., 456513.,
371662., 369374., 507946., 421076., 389181., 407920., 462813., 421187.,
373314., 247803., 166089., 140815., 165437., 155582., 154501., 157315.,
158951., 161149., 153546., 158947., 153414., 153265., 158005., 157873.,
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149352., 152559., 157103., 156552., 157422., 152207., 150130., 163362.,
156734., 155817., 151588., 151227., 154670., 151846., 159991., 153676.,
156325., 154975., 153288., 152011., 160342., 159806., 161912., 154936.,
158756., 153378., 154618., 153180., 159240., 152576., 150147., 154137.}
```

```
In[=]:= (*Plot the summed periodograms for blockage trace*)
ListLinePlot[sumPeriodograms, PlotRange -> All,
PlotLabel -> "Summed Periodograms for blockage original",
AxesLabel -> {"Segment Index", "Sum of Periodogram Values"}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms, Joined -> True, PlotStyle -> {Blue, Thin},
PlotRange -> All, PlotMarkers -> {Automatic, Small},
PlotLabel -> "Summed Periodograms for blockage",
AxesLabel -> {"Segment Index", "Sum of Periodogram Values"}, ImageSize -> Large]
```

Out[=]=



Out[=]=



```
In[=]:= (*Initialize the list to store the sum of periodograms without decay rate*)
sumPeriodograms1 = {};

(*Calculate the number of segments*)
numSegments1 = Quotient[Length[micromobility], 500];

(*Loop through each segment*)
For[i = 1, i ≤ numSegments1, i++,
  (*Extract the i^th segment of 500 values*)
  microSegment1 = Take[micromobility, {500 * (i - 1) + 1, 500 * i}];
  (*Compute the periodogram for the current segment*)
  periodogram1 = PeriodogramArray[microSegment1];
  (*Sum up the values of the periodogram*)
  sumPeriodogram1 = Total[periodogram1];
  (*Append the sum to the list*)
  AppendTo[sumPeriodograms1, sumPeriodogram1];]

(*Output the list of summed periodograms for micromobility*)
sumPeriodograms1

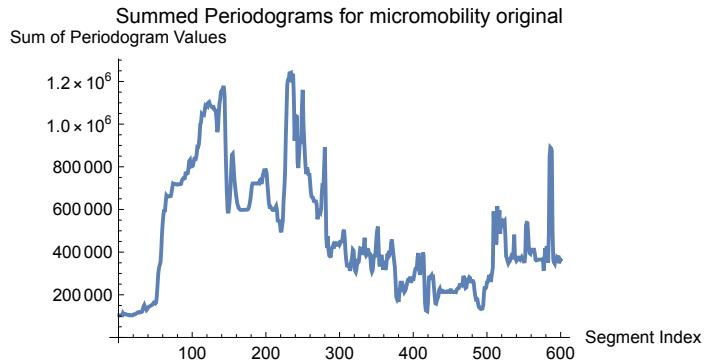
Out[=]= {103596., 103450., 103734., 104362., 103821., 113984., 108578., 108782.,
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103808., 103365., 103436., 106351., 108803., 108499., 109416., 111988.,
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143533., 145331., 147106., 150291., 151363., 153887., 158742., 163587.,
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832018., 801077., 803144., 802531., 804948., 824830., 839238., 840199.,
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1.10356 × 106, 1.0923 × 106, 1.08709 × 106, 1.08331 × 106, 1.07855 × 106, 1.07829 × 106,
1.0793 × 106, 1.06838 × 106, 1.06493 × 106, 1.06311 × 106, 1.02202 × 106,
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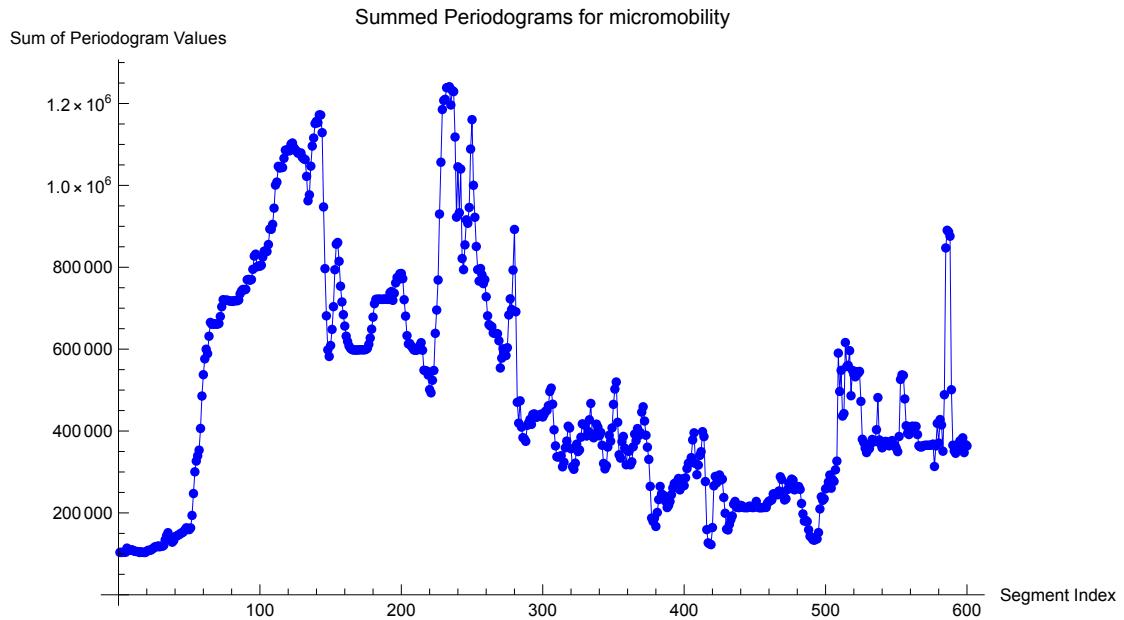
```
364 222., 365 066., 365 124., 365 226., 365 156., 365 186., 365 902., 368 127.,
313 410., 363 627., 418 681., 370 774., 427 999., 414 814., 350 746., 488 681.,
847 208., 890 361., 886 353., 875 781., 500 830., 365 330., 351 412., 345 636.,
366 584., 358 462., 376 010., 372 147., 383 423., 347 371., 366 860., 363 688.]
```

```
In[8]:= (*Plot the summed periodograms*)
ListLinePlot[sumPeriodograms1, PlotRange → All,
PlotLabel → "Summed Periodograms for micromobility original",
AxesLabel → {"Segment Index", "Sum of Periodogram Values"}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms1, Joined → True, PlotStyle → {Blue, Thin},
PlotRange → All, PlotMarkers → {Automatic, Small},
PlotLabel → "Summed Periodograms for micromobility",
AxesLabel → {"Segment Index", "Sum of Periodogram Values"}, ImageSize → Large]
```

Out[8]=

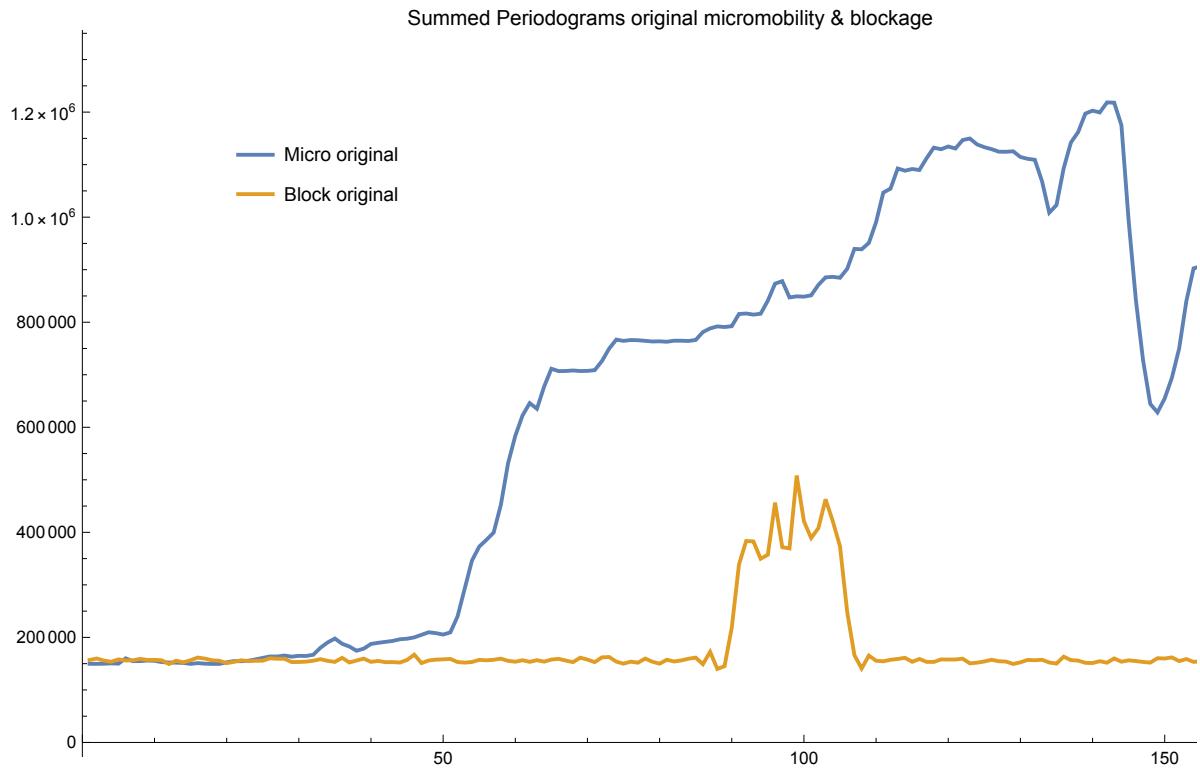


Out[8]=



```
In[=]:= ListLinePlot[{sumPeriodograms1 + 46152, sumPeriodograms},  
PlotRange → {{0, 163}, All}, PlotStyle → {BlueGray},  
PlotLabel → "Summed Periodograms original micromobility & blockage",  
PlotLegends → Placed[{"Micro original", "Block original"}, {0.2, 0.8}]]
```

Out[=]=



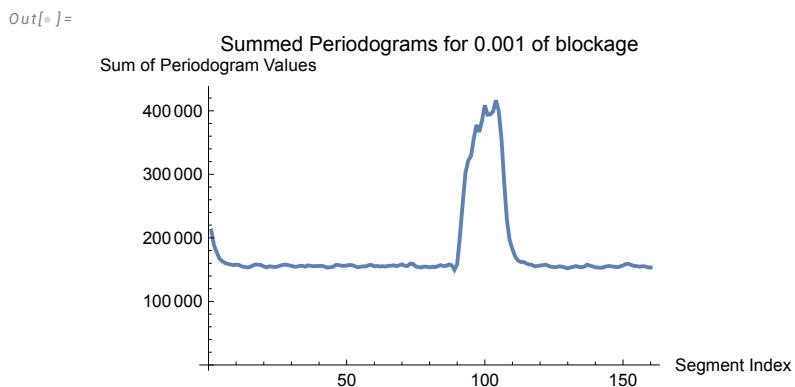
```
In[8]:= (*Initialize the list to store the sum of
periodograms with 0.001 decay rate for blockage*)
sumPeriodograms2 = {};

(*Calculate the number of segments*)
numSegments2 = Quotient[Length[movingAvg1], 500];

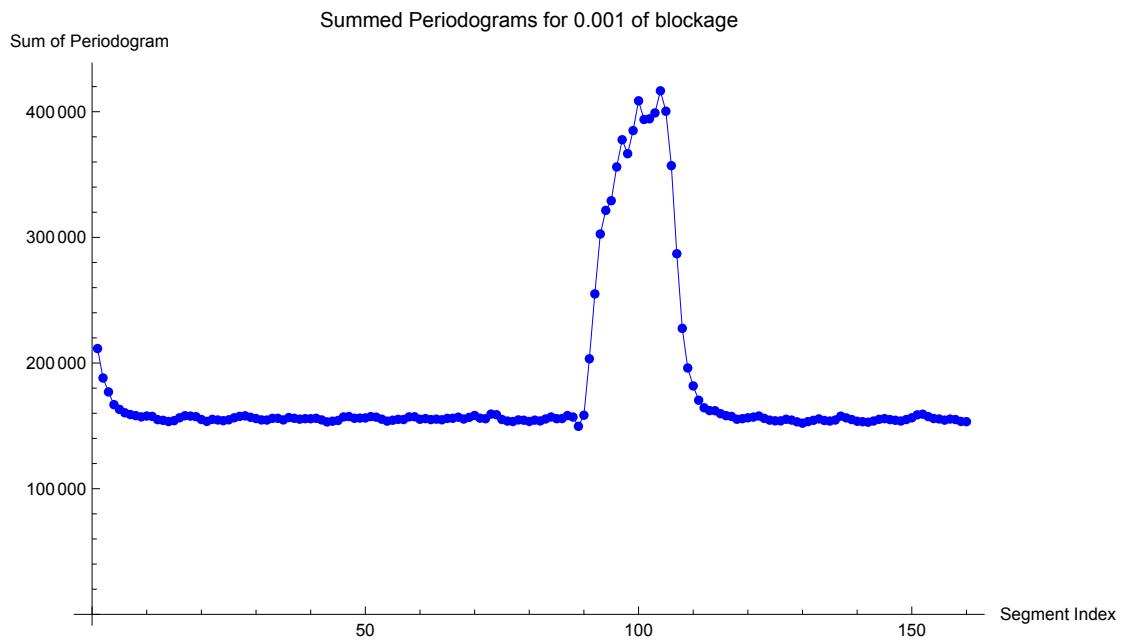
(*Loop through each segment*)
For[i = 1, i ≤ numSegments2, i++,
(*Extract the i^th segment of 500 values*)
blockSegment2 = Take[movingAvg1, {500 * (i - 1) + 1, 500 * i}];
(*Compute the periodogram for the current segment*)
periodogram2 = PeriodogramArray[blockSegment2];
(*Sum up the values of the periodogram*)
sumPeriodogram2 = Total[periodogram2];
(*Append the sum to the list*)
AppendTo[sumPeriodograms2, sumPeriodogram2];]

(*Output the list of summed periodograms for blockage trace*)
sumPeriodograms2
(*Plot the summed periodograms for 0.001*)
ListLinePlot[sumPeriodograms2, PlotRange → All,
PlotLabel → "Summed Periodograms for 0.001 of blockage",
AxesLabel → {"Segment Index", "Sum of Periodogram Values"}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms2, Joined → True, PlotStyle → {Blue, Thin},
PlotRange → All, PlotMarkers → {Automatic, Small},
PlotLabel → "Summed Periodograms for 0.001 of blockage",
AxesLabel → {"Segment Index", "Sum of Periodogram "}, ImageSize → Large]
```

```
Out[=] = {211545., 188097., 177028., 166887., 163123., 160396., 158995., 158134.,
157115., 157829., 157540., 154939., 154395., 153467., 154138., 156403.,
158057., 157778., 157350., 155078., 153549., 155176., 154684., 154122.,
154827., 156413., 157523., 157972., 156831., 155834., 154735., 154643.,
155983., 156001., 154740., 156609., 156031., 155343., 155719., 155671.,
156020., 154754., 153155., 153714., 154276., 157113., 157423., 156042.,
156178., 156287., 157392., 156923., 155327., 153772., 154483., 155178.,
155049., 157141., 157238., 155249., 155761., 155001., 155348., 154839.,
155955., 156027., 156913., 155423., 156733., 158259., 156127., 155680.,
159391., 158880., 155068., 153817., 153450., 154751., 154503., 153508.,
154550., 153953., 155476., 157063., 155718., 155836., 158189., 157008.,
149628., 158454., 203362., 255011., 302677., 321472., 329173., 356038.,
377692., 366629., 384980., 408684., 393803., 394350., 399039., 416630.,
400388., 357087., 286973., 227564., 196057., 181796., 170401., 164381.,
162165., 162037., 159703., 158142., 157530., 155280., 155724., 156423.,
156984., 157846., 155972., 154550., 154018., 153983., 155241., 154590.,
153196., 152137., 153375., 154408., 155547., 154277., 153844., 154651.,
157715., 156345., 155033., 153664., 153298., 152931., 153858., 155198.,
155762., 155011., 154455., 153867., 155059., 156405., 158784., 159289.,
157373., 155831., 155496., 154552., 155409., 155037., 153526., 153331.}
```



Out[ $\circ$ ] =



```
In[4]:= (*Initialize the list to store the sum of
periodograms with 0.001 decay rate for micromobility*)
sumPeriodograms3 = {};

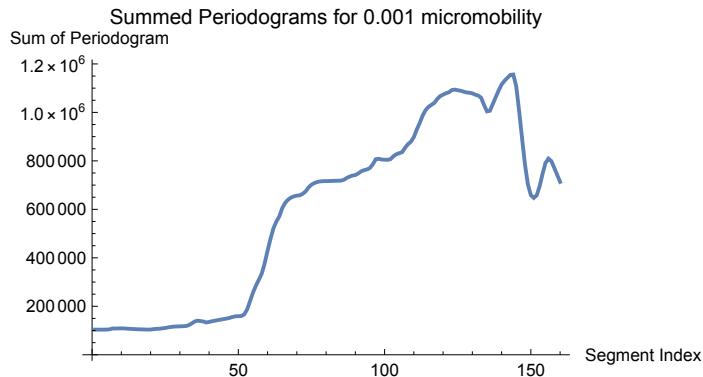
(*Calculate the number of segments*)
numSegments3 = Quotient[Length[movingAvg3], 500];

(*Loop through each segment*)
For[i = 1, i ≤ numSegments2, i++,
(*Extract the i^th segment of 500 values*)
blockSegment3 = Take[movingAvg3, {500 * (i - 1) + 1, 500 * i}];
(*Compute the periodogram for the current segment*)
periodogram3 = PeriodogramArray[blockSegment3];
(*Sum up the values of the periodogram*)
sumPeriodogram3 = Total[periodogram3];
(*Append the sum to the list*)
AppendTo[sumPeriodograms3, sumPeriodogram3];

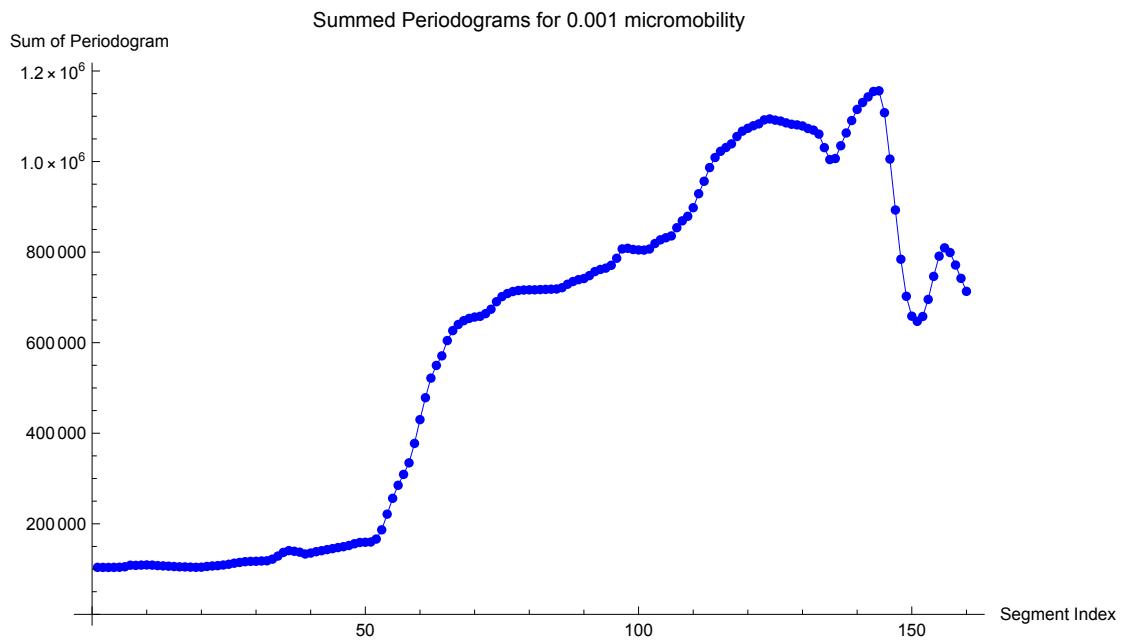
(*Output the list of summed periodograms for micromobility trace*)
sumPeriodograms3
(*Plot the summed periodograms for 0.001*)
ListLinePlot[sumPeriodograms3, PlotRange → All,
PlotLabel → "Summed Periodograms for 0.001 micromobility",
AxesLabel → {"Segment Index", "Sum of Periodogram "}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms3, Joined → True, PlotStyle → {Blue, Thin},
PlotRange → All, PlotMarkers → {Automatic, Small},
PlotLabel → "Summed Periodograms for 0.001 micromobility",
AxesLabel → {"Segment Index", "Sum of Periodogram "}, ImageSize → Large]
```

```
Out[8]=
{103 793., 103 682., 103 645., 103 755., 103 993., 105 087., 108 534., 108 173.,
108 783., 109 085., 108 702., 107 697., 107 006., 106 368., 105 609., 104 948.,
104 731., 104 274., 103 882., 104 145., 105 767., 106 852., 107 587., 108 931.,
110 604., 112 967., 114 701., 116 302., 117 002., 117 207., 117 913., 118 290.,
121 939., 128 694., 136 828., 140 783., 139 272., 137 326., 133 255., 135 374.,
138 402., 140 588., 142 968., 145 163., 147 466., 149 487., 152 077., 155 943.,
158 786., 159 240., 159 753., 166 304., 186 652., 221 302., 256 262., 285 074.,
309 072., 334 586., 377 485., 430 040., 478 435., 521 697., 549 792., 570 834.,
604 665., 626 620., 640 092., 648 473., 653 587., 656 550., 658 169., 664 086.,
673 843., 690 485., 701 753., 708 515., 712 954., 715 307., 716 301., 716 645.,
716 730., 717 246., 717 658., 718 088., 718 526., 721 432., 728 997., 734 969.,
739 149., 741 649., 748 048., 756 968., 761 683., 764 625., 770 865., 786 386.,
807 026., 808 461., 805 809., 804 774., 804 399., 806 841., 818 975., 827 136.,
831 690., 835 749., 853 876., 869 038., 879 092., 898 057., 928 962., 956 436.,
986 604., 1.0089 × 106, 1.02261 × 106, 1.03101 × 106, 1.03911 × 106, 1.05528 × 106,
1.0671 × 106, 1.07341 × 106, 1.07905 × 106, 1.08319 × 106, 1.09202 × 106,
1.09408 × 106, 1.09147 × 106, 1.08937 × 106, 1.08542 × 106, 1.08236 × 106,
1.08095 × 106, 1.07859 × 106, 1.07299 × 106, 1.0694 × 106, 1.0606 × 106, 1.03073 × 106,
1.00438 × 106, 1.00669 × 106, 1.03487 × 106, 1.06311 × 106, 1.09049 × 106,
1.11511 × 106, 1.13037 × 106, 1.1428 × 106, 1.15474 × 106, 1.1562 × 106, 1.10786 × 106,
1.00541 × 106, 893 013., 784 223., 702 451., 658 498., 647 116., 657 818.,
695 508., 746 357., 791 057., 809 444., 799 067., 771 465., 742 030., 713 313.}
```

Out[8]=

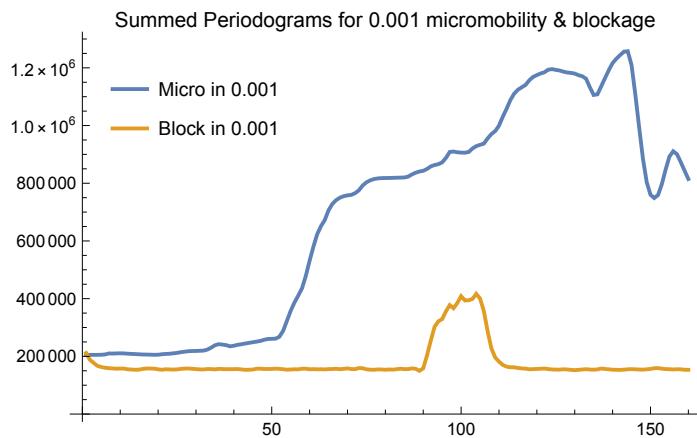


Out[•] =



```
In[•]:= ListLinePlot[{sumPeriodograms3 + 101495, sumPeriodograms2},
  PlotRange → All, PlotStyle → {BlueGray},
  PlotLabel → "Summed Periodograms for 0.001 micromobility & blockage",
  PlotLegends → Placed[{"Micro in 0.001", "Block in 0.001"}, {0.2, 0.8}]]
```

Out[•] =



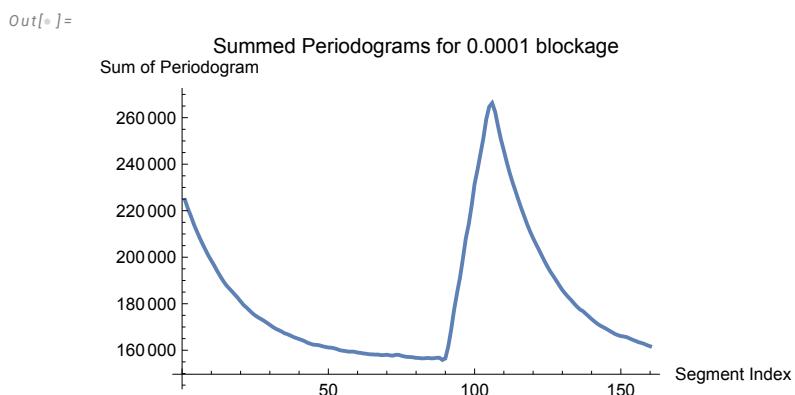
```
In[4]:= (*Initialize the list to store the sum of
periodograms with 0.0001 decay rate for blockage*)
sumPeriodograms4 = {};

(*Calculate the number of segments*)
numSegments4 = Quotient[Length[movingAvg2], 500];

(*Loop through each segment*)
For[i = 1, i ≤ numSegments4, i++,
(*Extract the i^th segment of 500 values*)
blockSegment4 = Take[movingAvg2, {500 * (i - 1) + 1, 500 * i}];
(*Compute the periodogram for the current segment*)
periodogram4 = PeriodogramArray[blockSegment4];
(*Sum up the values of the periodogram*)
sumPeriodogram4 = Total[periodogram4];
(*Append the sum to the list*)
AppendTo[sumPeriodograms4, sumPeriodogram4];

(*Output the list of summed periodograms for blockage trace*)
sumPeriodograms4
(*Plot the summed periodograms for 0.0001*)
ListLinePlot[sumPeriodograms4, PlotRange → All,
PlotLabel → "Summed Periodograms for 0.0001 blockage",
AxesLabel → {"Segment Index", "Sum of Periodogram "}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms4, Joined → True, PlotStyle → {Blue, Thin},
PlotRange → All, PlotMarkers → {Automatic, Small},
PlotLabel → "Summed Periodograms for 0.0001 blockage",
AxesLabel → {"Segment Index", "Sum of Periodogram "}, ImageSize → Large]
```

```
Out[=] = {224 595., 220 873., 217 723., 214 243., 211 257., 208 389., 205 702., 203 166.,
200 697., 198 544., 196 413., 194 067., 191 968., 189 922., 188 138., 186 701.,
185 382., 183 975., 182 586., 181 021., 179 499., 178 407., 177 166., 175 956.,
174 949., 174 140., 173 402., 172 669., 171 802., 170 928., 170 027., 169 252.,
168 691., 168 070., 167 310., 166 910., 166 345., 165 737., 165 268., 164 797.,
164 387., 163 819., 163 166., 162 743., 162 361., 162 301., 162 110., 161 703.,
161 429., 161 191., 161 084., 160 859., 160 464., 160 015., 159 785., 159 615.,
159 384., 159 425., 159 333., 158 989., 158 867., 158 623., 158 479., 158 263.,
158 232., 158 126., 158 142., 157 901., 157 926., 158 070., 157 819., 157 669.,
158 026., 158 046., 157 616., 157 335., 157 122., 157 085., 156 953., 156 710.,
156 674., 156 501., 156 566., 156 697., 156 539., 156 544., 156 752., 156 740.,
155 821., 156 480., 161 610., 168 925., 177 424., 184 603., 191 149., 199 380.,
208 111., 214 173., 222 238., 231 512., 237 604., 244 363., 251 169., 259 417.,
264 720., 266 293., 262 631., 256 436., 250 670., 245 861., 240 849., 236 242.,
232 111., 228 385., 224 560., 220 903., 217 513., 214 041., 211 008., 208 220.,
205 604., 203 199., 200 606., 198 093., 195 769., 193 607., 191 750., 189 791.,
187 810., 185 886., 184 319., 182 886., 181 600., 180 118., 178 756., 177 586.,
176 841., 175 706., 174 570., 173 407., 172 368., 171 366., 170 546., 169 897.,
169 241., 168 470., 167 731., 167 002., 166 485., 166 098., 165 908., 165 640.,
165 071., 164 511., 164 031., 163 494., 163 155., 162 735., 162 168., 161 706.}
```



*Out[ ] =*

Summed Periodograms for 0.0001 blockage

Sum of Periodogram

260 000  
240 000  
220 000  
200 000  
180 000  
160 000

50 100 150 Segment Index

```

In[ ] := (*Initialize the list to store the sum of
   periodograms with 0.0001 decay rate for micromobility*)
sumPeriodograms5 = {};

(*Calculate the number of segments*)
numSegments5 = Quotient[Length[movingAvg4], 500];

(*Loop through each segment*)
For[i = 1, i ≤ numSegments5, i++,
  (*Extract the i^th segment of 500 values*)
  blockSegment5 = Take[movingAvg4, {500 * (i - 1) + 1, 500 * i}];
  (*Compute the periodogram for the current segment*)
  periodogram5 = PeriodogramArray[blockSegment5];
  (*Sum up the values of the periodogram*)
  sumPeriodogram5 = Total[periodogram5];
  (*Append the sum to the list*)
  AppendTo[sumPeriodograms5, sumPeriodogram5];]

(*Output the list of summed periodograms for micromobility trace*)
sumPeriodograms5

(*Plot the summed periodograms for 0.0001*)
ListLinePlot[sumPeriodograms5, PlotRange → All,
  PlotLabel → "Summed Periodograms for 0.0001 micromobility",
  AxesLabel → {"Segment Index", "Sum of Periodogram "}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms5, Joined → True, PlotStyle → {Blue, Thin},
  PlotRange → All, PlotMarkers → {Automatic, Small},
  PlotLabel → "Summed Periodograms for 0.0001 micromobility",
  AxesLabel → {"Segment Index", "Sum of Periodogram "}, ImageSize → Large]

Out[ ] =
{103 842., 103 827., 103 814., 103 819., 103 846., 103 968., 104 456., 104 608.,
```

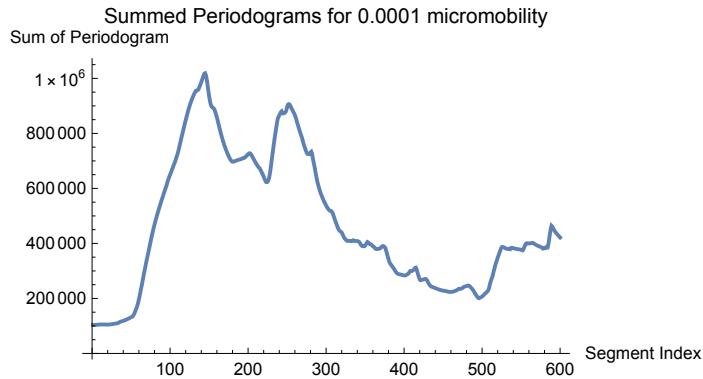
104 854., 105 081., 105 233., 105 279., 105 312., 105 317., 105 278., 105 209.,  
 105 171., 105 094., 105 005., 104 977., 105 133., 105 298., 105 463., 105 725.,  
 106 080., 106 578., 107 094., 107 648., 108 149., 108 594., 109 092., 109 556.,  
 110 382., 111 706., 113 423., 114 977., 116 014., 116 892., 117 370., 118 354.,  
 119 504., 120 642., 121 850., 123 086., 124 382., 125 689., 127 088., 128 685.,  
 130 276., 131 657., 132 992., 134 931., 138 526., 144 225., 150 997., 158 192.,  
 165 718., 173 934., 184 267., 196 565., 209 875., 223 988., 237 961., 251 883.,  
 267 233., 282 381., 297 171., 311 600., 325 648., 339 281., 352 495., 365 727.,  
 379 108., 393 070., 406 715., 419 893., 432 658., 444 944., 456 748., 468 093.,  
 479 001., 489 538., 499 681., 509 445., 518 835., 528 103., 537 635., 546 927.,  
 555 907., 564 507., 573 242., 582 202., 590 714., 598 869., 607 126., 616 322.,  
 626 391., 634 883., 642 565., 649 986., 657 106., 664 186., 672 167., 679 907.,  
 687 270., 694 430., 703 000., 711 725., 720 152., 729 599., 740 758., 752 478.,  
 765 107., 777 701., 789 770., 801 352., 812 737., 824 877., 836 764., 848 037.,  
 859 044., 869 623., 880 480., 890 516., 899 672., 908 370., 916 375., 923 934.,  
 931 211., 938 002., 943 984., 949 669., 954 378., 956 000., 956 380.,  
 958 846., 964 459., 971 170., 978 724., 986 910., 994 769.,  $1.00259 \times 10^6$ ,  
 $1.01061 \times 10^6$ ,  $1.01766 \times 10^6$ ,  $1.01884 \times 10^6$ ,  $1.01092 \times 10^6$ , 996 538., 976 934.,  
 955 554., 935 854., 919 435., 906 484., 898 623., 894 985., 893 389., 890 746.,  
 885 464., 877 599., 868 413., 858 207., 846 940., 835 311., 823 687., 812 215.,  
 801 165., 790 566., 780 558., 771 077., 762 121., 753 665., 745 669., 738 130.,  
 730 981., 724 208., 717 816., 711 836., 706 517., 702 080., 698 897., 697 119.,  
 696 997., 698 040., 699 196., 700 307., 701 358., 702 360., 703 285., 704 193.,  
 705 074., 705 899., 706 664., 707 549., 709 484., 710 293., 710 899., 712 989.,  
 715 528., 718 265., 721 210., 724 238., 727 015., 727 976., 726 502., 722 958.,  
 717 870., 712 516., 707 363., 702 227., 697 044., 692 002., 687 234., 682 794.,  
 678 980., 675 650., 672 311., 667 162., 661 034., 655 211., 649 592., 642 872.,  
 634 967., 628 659., 623 416., 622 763., 624 175., 628 932., 639 559., 654 584.,  
 674 194., 696 749., 718 243., 739 927., 761 258., 781 890., 801 060., 818 968.,  
 837 311., 852 884., 860 387., 865 779., 871 163., 877 294., 880 186., 874 323.,  
 872 499., 873 093., 875 125., 877 603., 883 855., 895 076., 904 480., 906 478.,  
 905 648., 901 212., 895 041., 888 982., 884 391., 878 269., 872 936., 866 645.,  
 858 291., 848 556., 838 449., 829 300., 819 794., 810 423., 801 568., 793 194.,  
 784 874., 774 563., 763 155., 754 479., 746 323., 737 904., 730 439., 725 780.,  
 725 146., 724 312., 724 553., 731 039., 733 449., 726 240., 709 374., 695 229.,  
 682 099., 665 905., 650 385., 635 280., 621 919., 611 401., 601 352., 591 899.,  
 583 100., 575 966., 568 739., 561 618., 555 226., 549 166., 543 530., 538 102.,  
 532 890., 528 356., 524 500., 520 859., 518 767., 518 138., 516 631., 512 456.,  
 505 597., 497 129., 488 579., 480 513., 473 115., 465 244., 457 194., 451 279.,  
 447 041., 444 299., 442 752., 439 795., 434 171., 427 513., 421 355., 417 522.,  
 414 848., 411 223., 409 127., 408 947., 409 352., 409 597., 409 356., 408 167.,  
 408 472., 410 418., 411 583., 410 040., 409 137., 408 702., 408 902., 408 515.,  
 407 814., 406 380., 403 126., 398 341., 393 717., 390 839., 390 049., 389 954.,  
 389 671., 391 990., 396 311., 401 558., 405 298., 403 614., 400 156., 397 614.,  
 397 006., 395 978., 392 769., 389 630., 388 034., 385 432., 381 525., 379 865.,  
 379 784., 380 147., 379 948., 381 284., 381 705., 383 475., 386 937., 389 648.,  
 390 552., 389 759., 387 480., 382 941., 373 817., 362 951., 352 775., 342 684.,

```

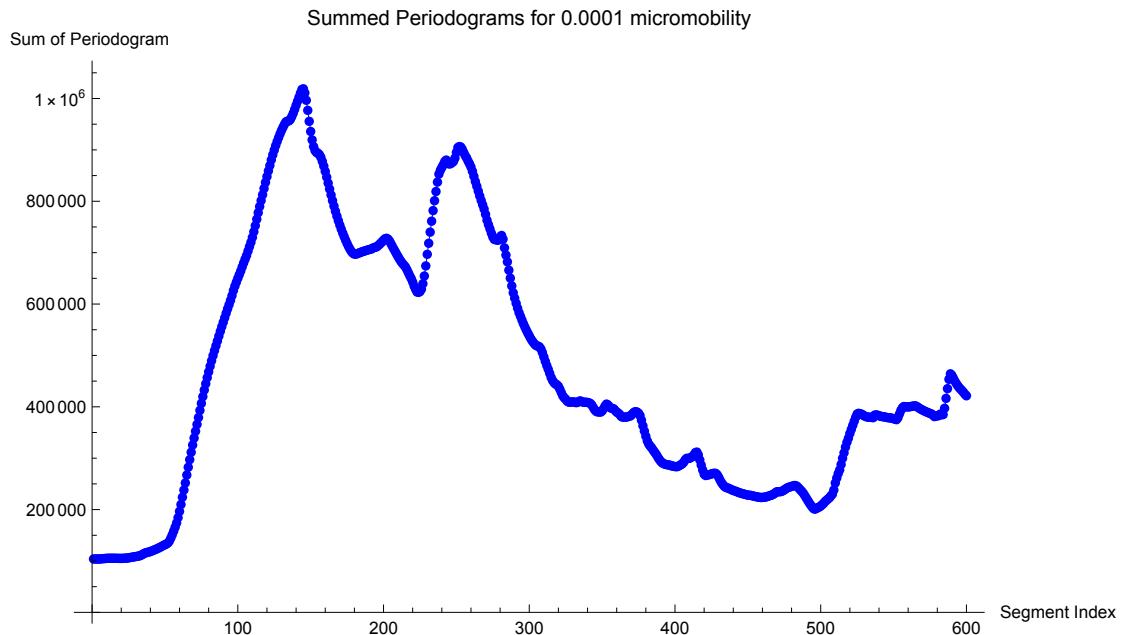
333 650., 327 441., 323 459., 320 159., 315 706., 311 776., 307 864., 303 196.,
298 492., 294 558., 291 501., 289 603., 288 448., 287 688., 287 008., 286 761.,
286 022., 284 600., 284 376., 283 723., 283 399., 283 978., 285 563., 287 269.,
289 085., 292 130., 296 828., 299 756., 299 627., 299 861., 301 314., 303 355.,
306 581., 310 892., 311 906., 306 521., 296 665., 286 637., 277 066., 268 925.,
266 333., 266 984., 267 779., 268 322., 269 349., 270 267., 270 711., 270 367.,
267 657., 262 900., 256 948., 252 043., 248 182., 244 890., 243 033., 242 199.,
241 148., 239 747., 238 416., 237 193., 236 385., 235 247., 234 133., 233 082.,
232 078., 231 214., 230 486., 229 683., 228 867., 228 144., 227 933., 227 602.,
226 868., 226 166., 225 503., 224 882., 224 318., 223 839., 223 515., 223 731.,
223 983., 224 301., 225 046., 226 076., 227 070., 227 968., 229 012., 230 703.,
232 898., 234 894., 234 804., 234 711., 235 221., 236 586., 238 320., 240 240.,
242 216., 243 425., 244 146., 245 102., 246 035., 246 855., 246 527., 244 639.,
241 587., 238 453., 235 503., 232 002., 227 600., 222 899., 218 281., 213 624.,
209 396., 205 444., 202 051., 200 740., 202 185., 203 774., 205 036., 206 904.,
209 524., 212 087., 215 640., 218 092., 220 686., 222 944., 226 654., 229 919.,
238 089., 251 690., 261 357., 270 076., 277 146., 287 798., 299 855., 310 471.,
321 620., 331 052., 338 916., 348 099., 356 044., 364 072., 371 935., 379 692.,
385 923., 387 386., 386 571., 385 803., 383 886., 382 271., 380 925., 380 047.,
379 858., 379 683., 379 374., 378 862., 383 737., 384 248., 383 769., 382 714.,
381 617., 380 972., 380 761., 380 193., 379 479., 378 843., 378 715., 378 336.,
377 769., 376 976., 375 816., 375 055., 378 777., 385 919., 392 879., 397 904.,
400 526., 399 964., 400 162., 399 583., 400 132., 400 684., 401 199., 401 692.,
401 944., 400 454., 398 544., 396 679., 394 976., 393 481., 392 073., 390 739.,
389 473., 388 269., 387 129., 386 170., 384 045., 380 986., 381 956.,
382 525., 382 819., 385 841., 384 696., 384 828., 397 181., 416 413.,
435 329., 453 499., 464 177., 461 329., 455 918., 450 205., 445 438.,
441 212., 437 452., 434 254., 431 282., 428 042., 424 320., 421 507.}

```

Out[ ] =



Out[•] =



```
In[•]:= ListLinePlot[{sumPeriodograms5, sumPeriodograms4 - 114100},
  PlotRange → {{0, 165}, All}, PlotStyle → {BlueGray},
  PlotLabel → "Summed Periodograms for 0.0001 micromobility & blockage",
  PlotLegends → Placed[{"Micro in 0.0001", "Block in 0.0001"}, {0.3, 0.6}]]
```

Out[•] =

