

```
In[1]:= ClearAll["Global`*"]
SetDirectory[
  "/Users/humayrajeba/Documents/Wolfram Mathematica/processed_data_dBm"];
data = Import["updated_video_2.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]=

```
{-14.8311, -14.8308, -14.8308, -14.8301, -14.8301, -14.8316, -14.8316, -14.8332,
-14.8332, -14.8345, -14.8345, -14.8351, ... 299.977 ..., -15.5473, -15.5436, -15.5436,
-15.5407, -15.5407, -15.5374, -15.5374, -15.533, -15.533, -15.5279, -15.5279, -15.527}
```

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]=

```
{-14.8311, -14.8308, -14.8308, -14.8301, -14.8301, -14.8316, -14.8316, -14.8332,
-14.8332, -14.8345, -14.8345, -14.8351, ... 299.977 ..., -15.5473, -15.5436, -15.5436,
-15.5407, -15.5407, -15.5374, -15.5374, -15.533, -15.533, -15.5279, -15.5279, -15.527}
```

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



```
In[1]:= microPeriodogram = PeriodogramArray@micro1
ListLinePlot[micro1, PlotRange -> All]
```

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

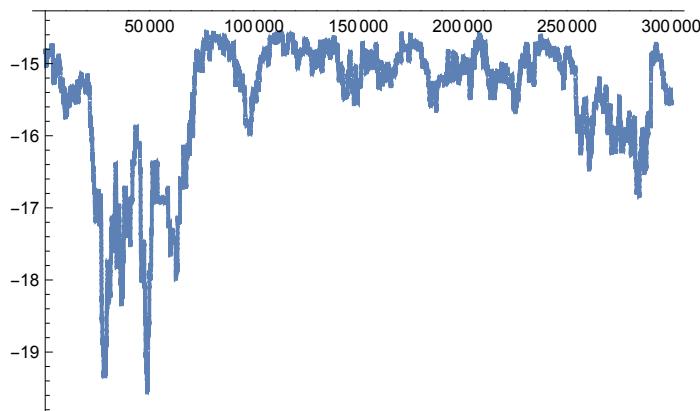
Out[1]=

$\{7.19393 \times 10^7, 42066., 16589.6, 12819.6, 12807., 6432.19, 67.6425, 1958.66, 2395.34,$   
 $3810.05, 993.605, 923.566, 426.07, \dots 299.974 \dots, 2254.21, 426.07, 923.566, 993.605,$   
 $3810.05, 2395.34, 1958.66, 67.6425, 6432.19, 12807., 12819.6, 16589.6, 42066.\}$

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



Out[2]=



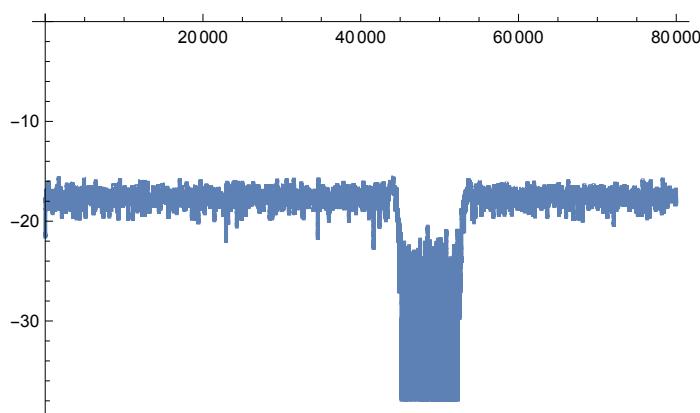
Out[3]=

$\{2.30049 \times 10^8, 76480.3, 71028., 60399.1, 47904.4, 35121.7, 23885.7, 14186.5, 6382.24,$   
 $2808.34, 619.054, 178.768, 560.247, \dots 79.974 \dots, 2232.03, 957.728, 398.313, 450.223,$   
 $2182.64, 5337.34, 12624.6, 21985.1, 33205.7, 46336.8, 59118.4, 69809.5, 75610.8\}$

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



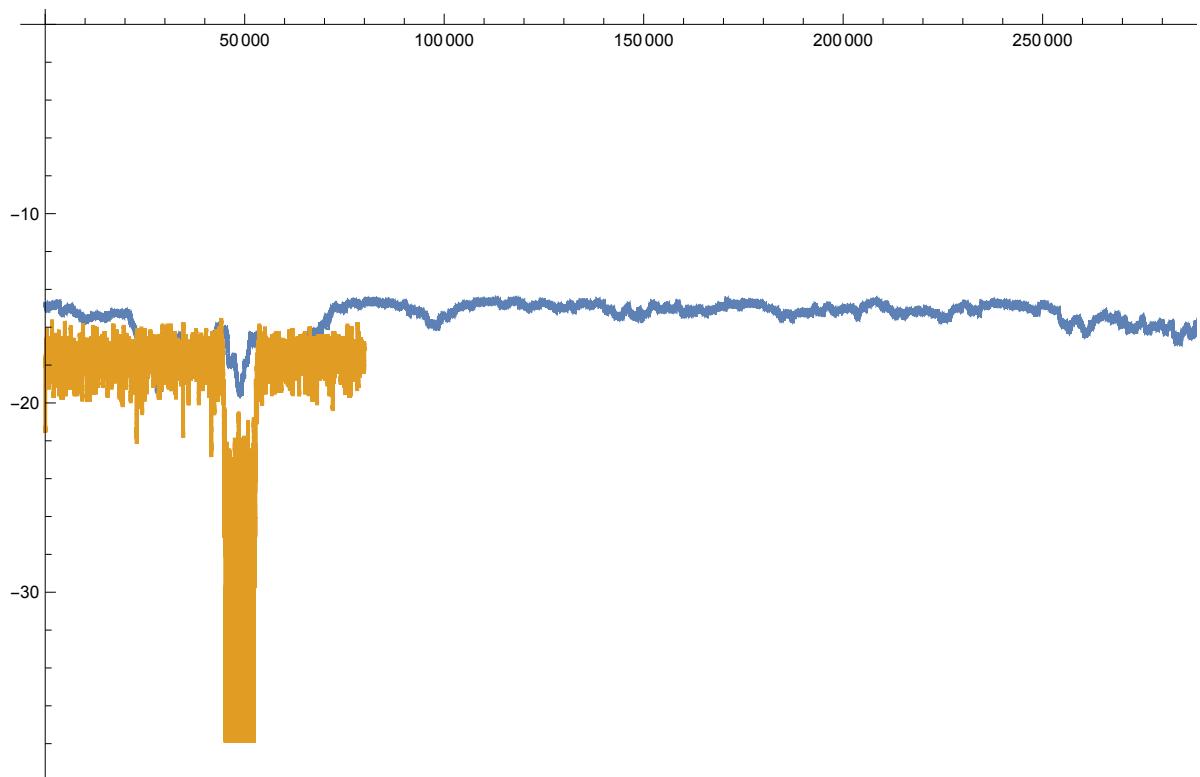
Out[4]=



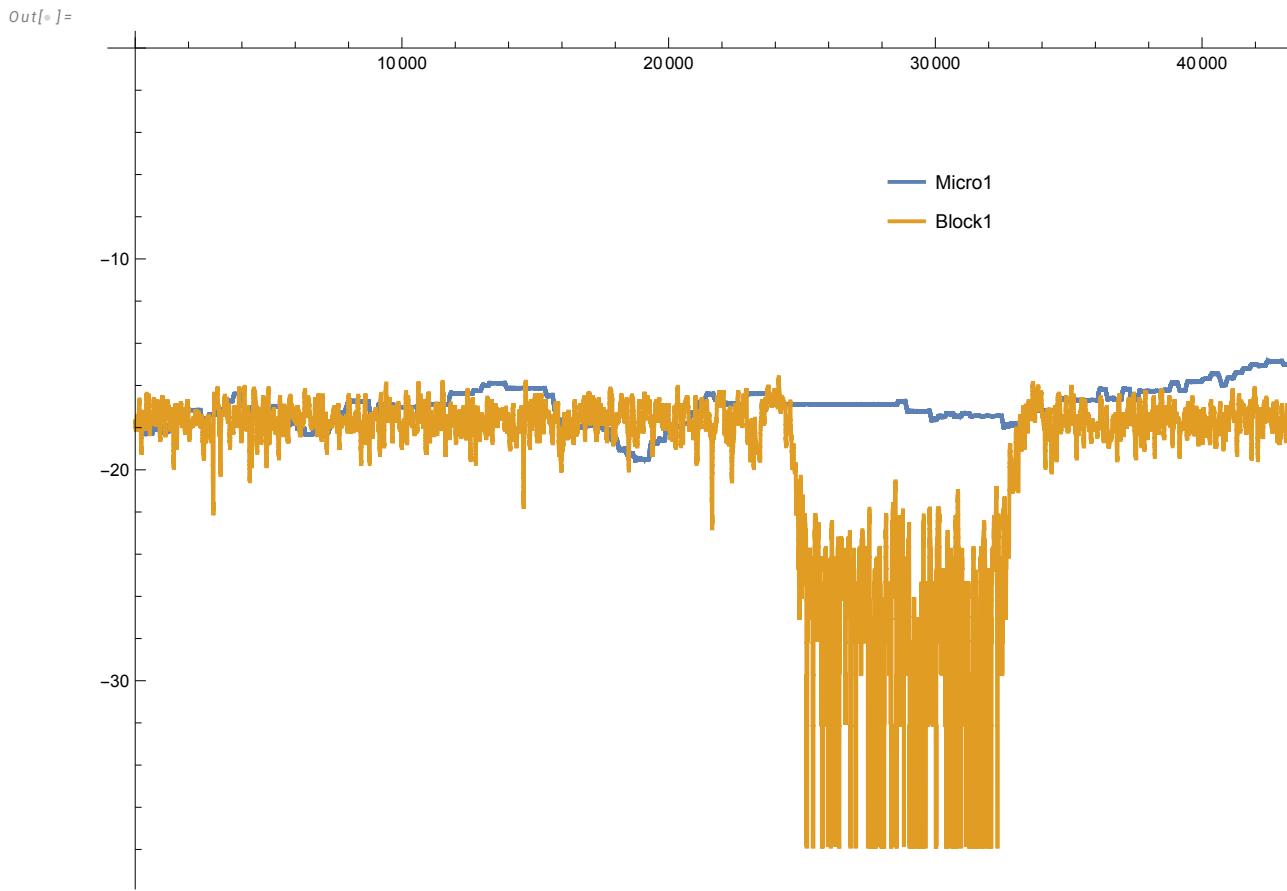
```
In[8]:= microPeriodogram = PeriodogramArray[micro1];
blockPeriodogram = PeriodogramArray[block1];

ListLinePlot[{micro1, block1 + 35},
PlotRange → All, PlotLegends → {"Micro1", "Block1"}]
```

Out[8]=



```
In[4]:= ListLinePlot[{micro1[[30000 ;; 80000]], block1[[20000 ;; 70000]] + 35},
  PlotRange -> All, PlotStyle -> {Blue, Gray},
  PlotLegends -> Placed[{"Micro1", "Block1"}, {0.6, 0.8}]]
```



```
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)



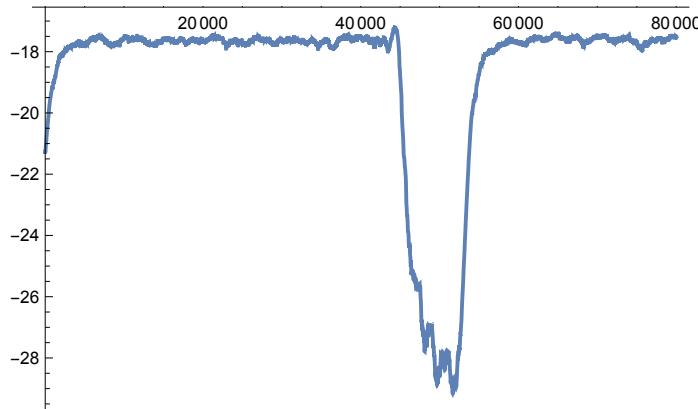
Out[5]=

```
{-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[=]



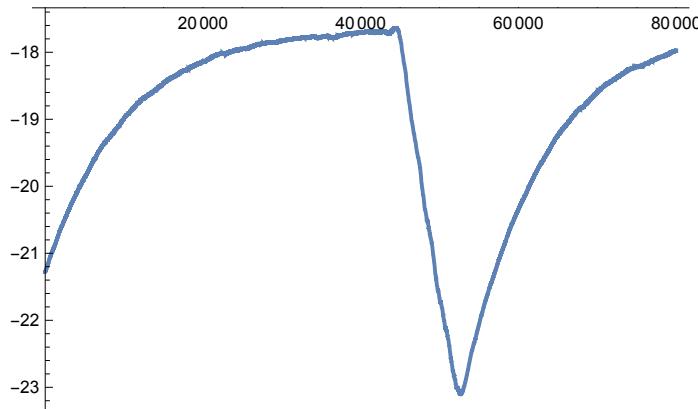
Out[=]

```
{-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[=]



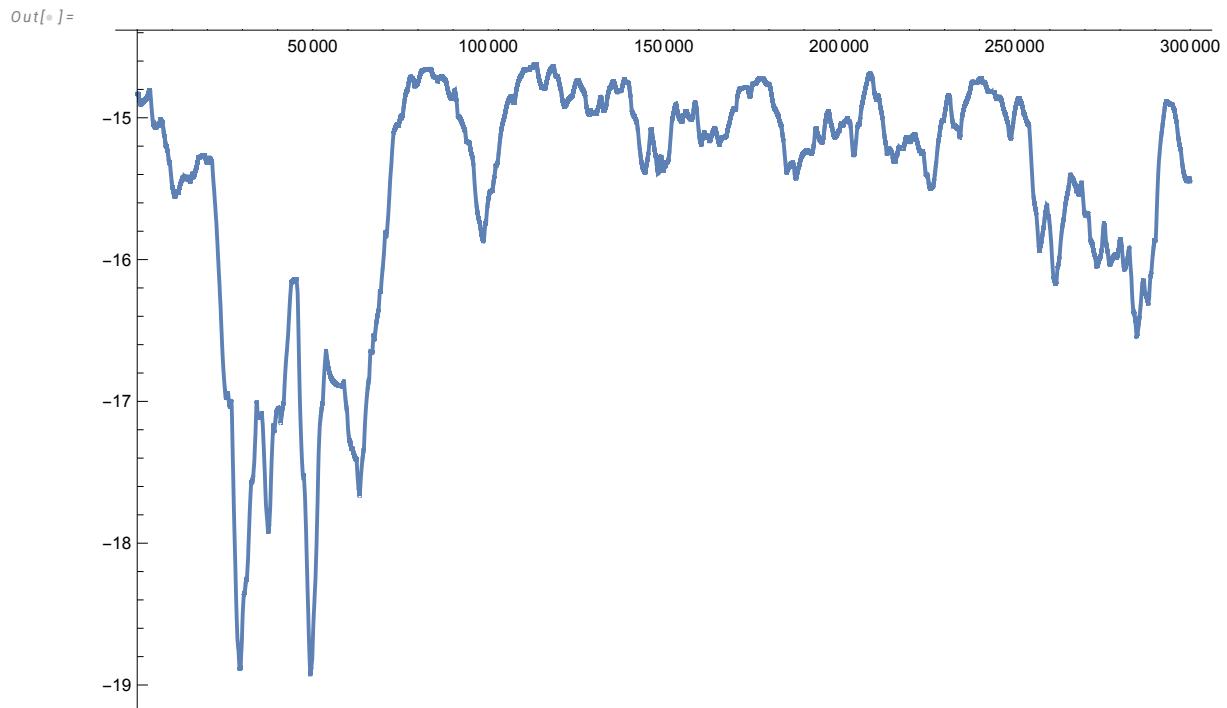
```
In[=]:= movingAvg3 = Re[ExponentialMovingAverage[micromobility, decayRate1]]
ListLinePlot[movingAvg3, PlotRange → All]
movingAvg4 = Re[ExponentialMovingAverage[micromobility, decayRate2]]
ListLinePlot[movingAvg4, PlotRange → All]
```

Out[=]

```
{-14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311,
-14.8311, -14.8311, -14.8311, -14.8311, ... 299977 ..., -15.4488, -15.4489, -15.4489,
-15.449, -15.4491, -15.4492, -15.4493, -15.4494, -15.4495, -15.4496, -15.4496, -15.4497}
```

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



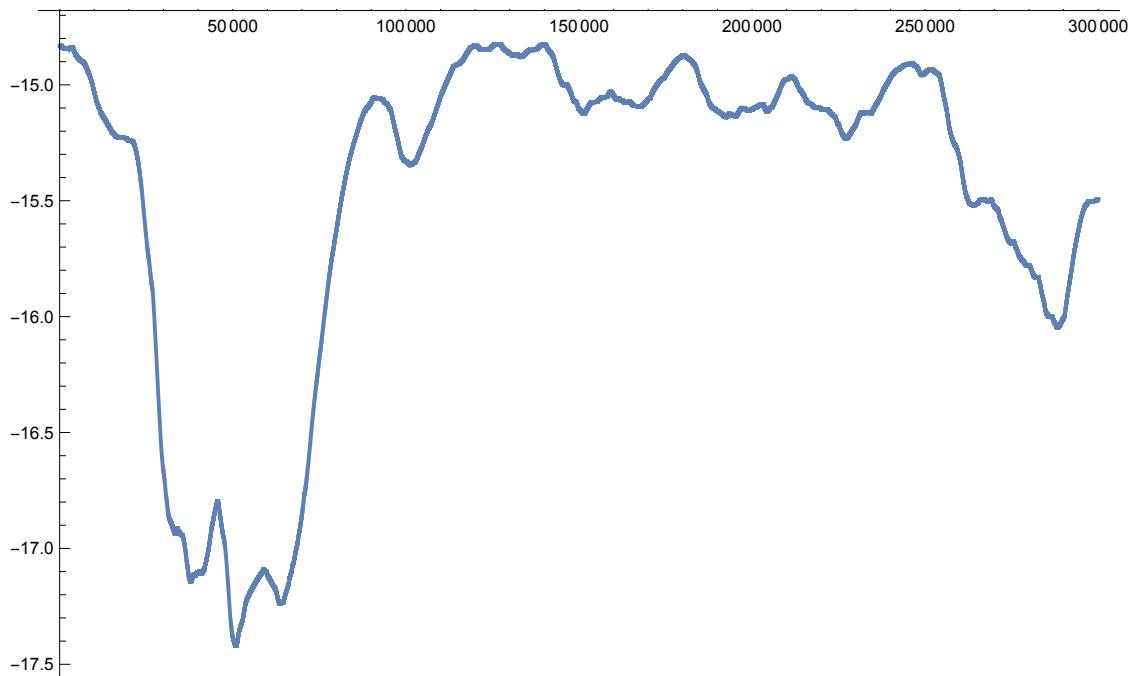


Out[=]

```
{-14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311, -14.8311,
-14.8311, -14.8311, -14.8311, -14.8311, ..., 299.977..., -15.496, -15.496, -15.496,
-15.496, -15.496, -15.496, -15.496, -15.496, -15.496, -15.496}
```

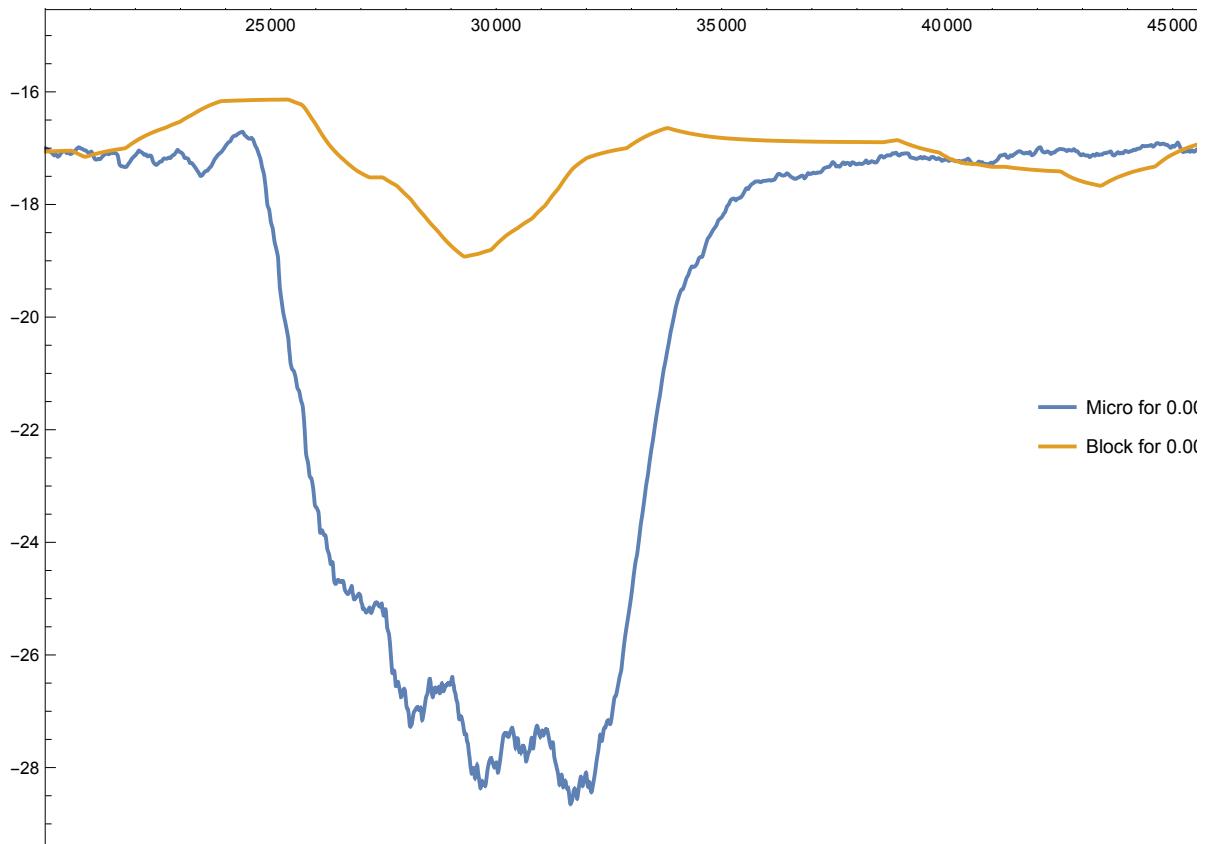
Full expression not available (original memory size: 2.4 MB)

Out[=]



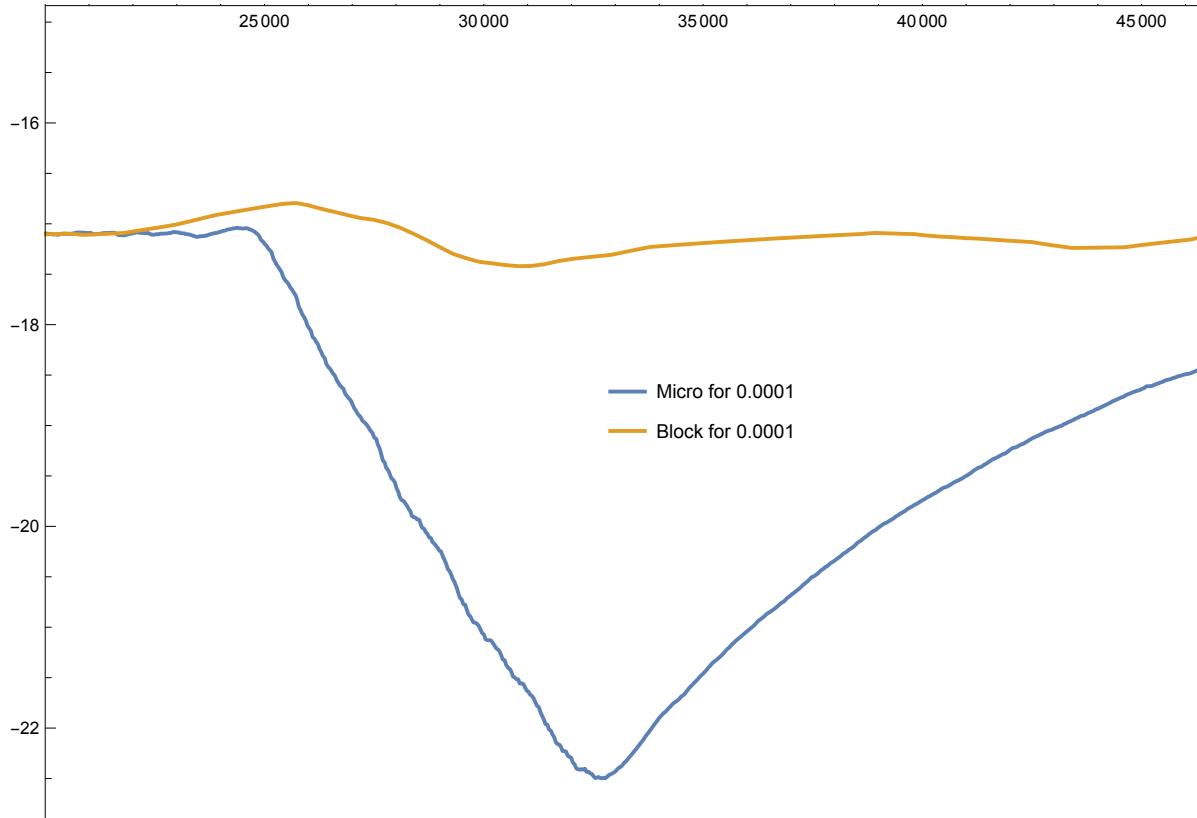
```
In[8]:= ListLinePlot[{movingAvg1[[20 000 ;; 70 000]] + 0.5, movingAvg3[[20 000 ;; 70 000]]},  
PlotRange → {{20 000, 50 000}, All}, PlotStyle → {BlueGray},  
PlotLegends → Placed[{"Micro for 0.001", "Block for 0.001"}, {0.8, 0.5}]]
```

Out[8]=



```
In[8]:= ListLinePlot[{movingAvg2[[20 000 ;; 70 000]] + 0.6, movingAvg4[[20 000 ;; 70 000]]},  
PlotRange → {{20 000, 50 000}, All}, PlotStyle → {BlueGray},  
PlotLegends → Placed[{"Micro for 0.0001", "Block for 0.0001"}, {0.5, 0.5}]]
```

Out[8]=



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

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

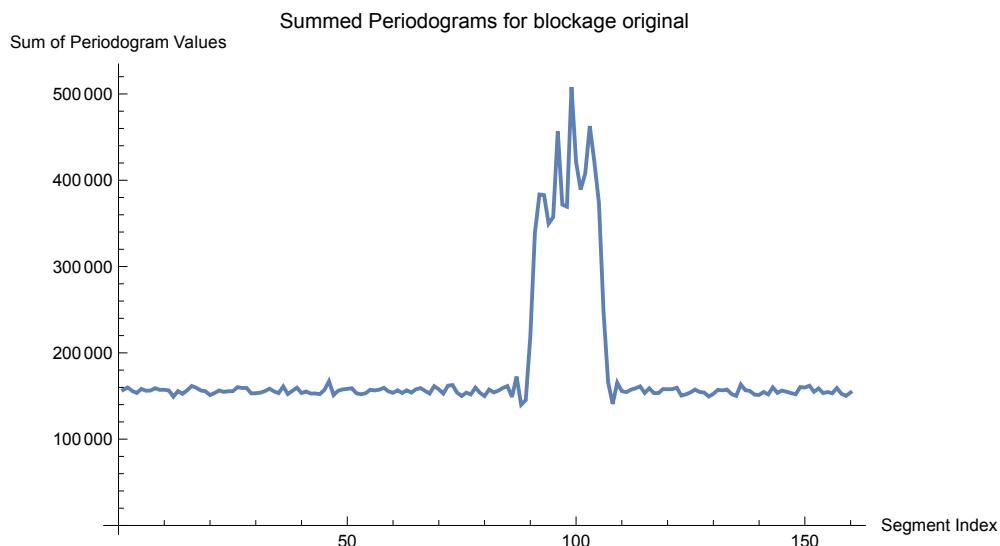
(*Loop through each segment*)
For[i = 1, i ≤ numSegments, i++,
  (*Extract the i^th segment of 500 values*)
  blockSegment = Take[block, {500 * (i - 1) + 1, 500 * i}];
  (*Compute the periodogram for the current segment*)
  periodogram = PeriodogramArray[blockSegment];
  (*Sum up the values of the periodogram*)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

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

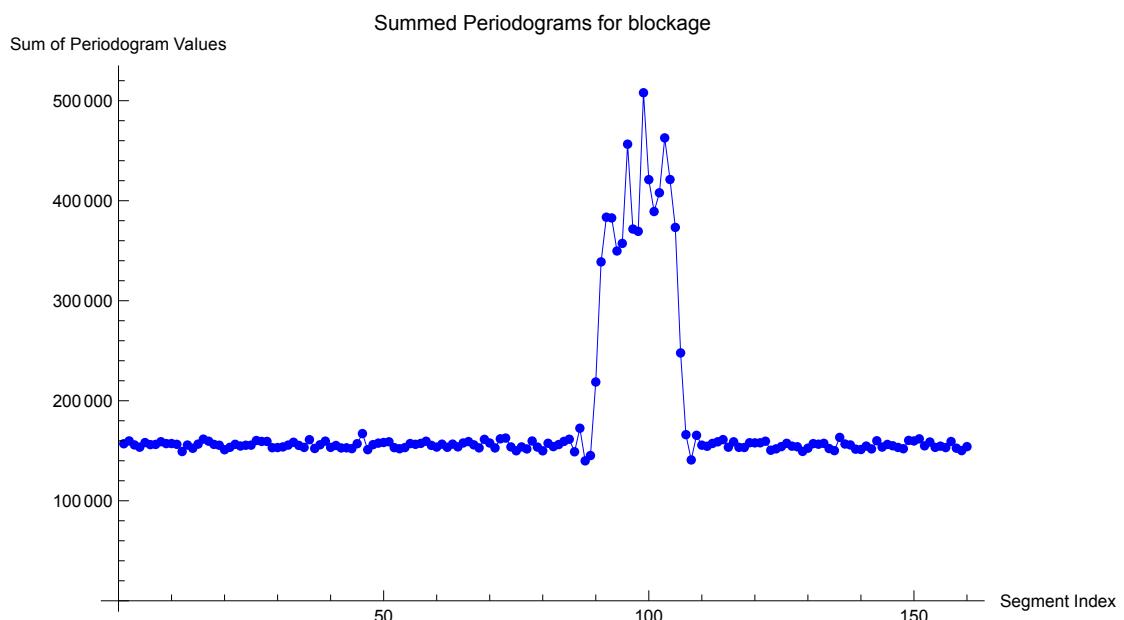
Out[=]= {156999., 159843., 155849., 153551., 158178., 156125., 156326., 159035.,
157153., 157208., 156418., 149249., 155707., 152467., 156637., 161624.,
159546., 156356., 155529., 151034., 153419., 156424., 154742., 155509.,
155609., 160251., 159306., 159335., 153034., 153201., 153846., 155668.,
158504., 155335., 153345., 161077., 152272., 155984., 159612., 153391.,
155270., 152797., 152931., 152132., 157041., 167167., 151092., 156117.,
157649., 158272., 158941., 153130., 152008., 153188., 157202., 156422.,
157334., 159512., 155373., 153678., 156579., 153470., 156628., 153892.,
157786., 159170., 155919., 152878., 161399., 157743., 152836., 161951.,
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.,
157948., 159537., 150529., 151908., 154146., 157435., 154610., 153991.,
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];]

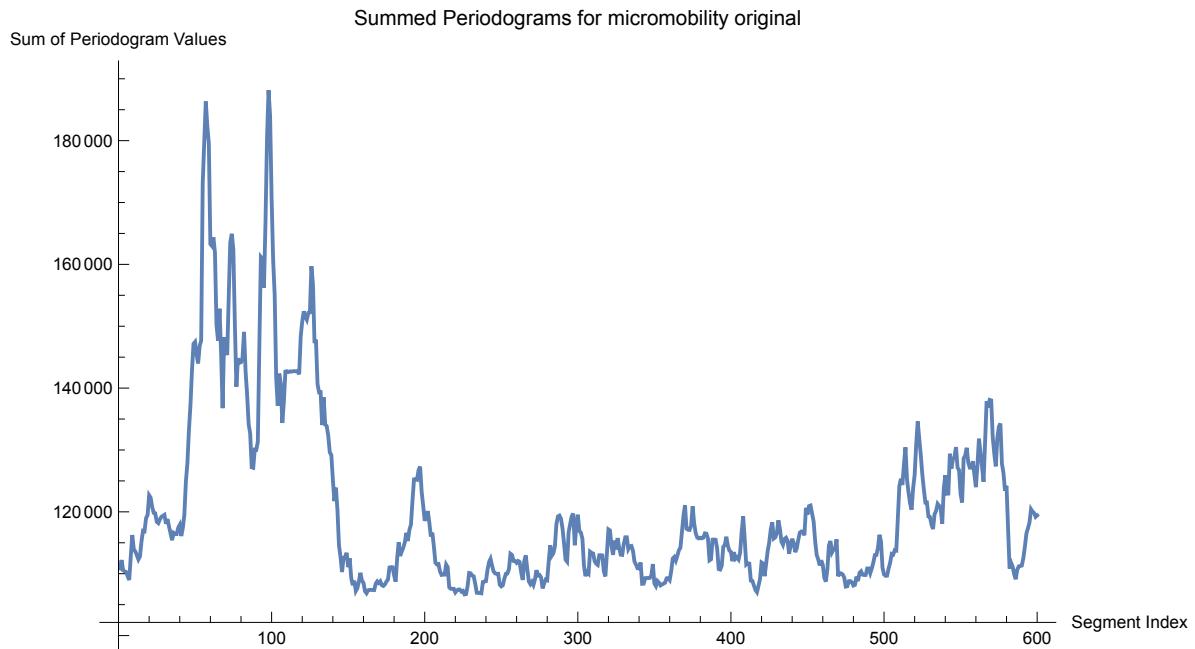
(*Output the list of summed periodograms for micromobility*)
sumPeriodograms1

Out[=]=
{110849., 112203., 110571., 110388., 110277., 109584., 108979., 112722.,
 116241., 113930., 113596., 112978., 112301., 112785., 115181., 116934.,
 116861., 118988., 119481., 122672., 122283., 120766., 119840., 119745.,
 118385., 118165., 118759., 119194., 119347., 119512., 118080., 118826.,
 117612., 116517., 115418., 116588., 116394., 116404., 117423., 117888.,
 116094., 117389., 119496., 124814., 127945., 133153., 137300., 142911.,
 147165., 147465., 145418., 143993., 146799., 147694., 173063., 179712.,
 186323., 182380., 179554., 163277., 162983., 164354., 161888., 150217.,
 147698., 152831., 145669., 136757., 148194., 146794., 145340., 154859.,
 163568., 164944., 162416., 150355., 140209., 144807., 144099., 144174.,
 144939., 149094., 142691., 138929., 134178., 132660., 127203., 127123.,
 130056., 130020., 131337., 146961., 161198., 160891., 156246., 166783.,
 180277., 188169., 184051., 170648., 160690., 155071., 141509., 137160.,
 142339., 140714., 134368., 137746., 142680., 142730., 142592., 142701.,
 142663., 142739., 142744., 142699., 142782., 142232., 148322., 150781.,
 152406., 151553., 151043., 152165., 152227., 159708., 156763., 147558.,
 147555., 140640., 139318., 139340., 134019., 138524., 134119., 133860.,
 132279., 129609., 129196., 125237., 121731., 123909., 120266., 114592.,
 112705., 110270., 112571., 112695., 113377., 111073., 112503., 109276.,
 108143., 108867., 107208., 107663., 108737., 110141., 108875., 108518.,
 107178., 106847., 107315., 107386., 107382., 107365., 107355., 108401.,
 108764., 108504., 108775., 108152., 108027., 108261., 108735., 109057.,
 111008., 111066., 111047., 109769., 108718., 112483., 115081., 112873.,
 113585., 114218., 115074., 116595., 115290., 117082., 117923., 121747.,
 125252., 125302., 125195., 126753., 127312., 123249., 120978., 118569.,
 119115., 120105., 118291., 116009., 116617., 114361., 111758., 111486.,
 111549., 110358., 109801., 109856., 109850., 111482., 111067., 107802.,
```

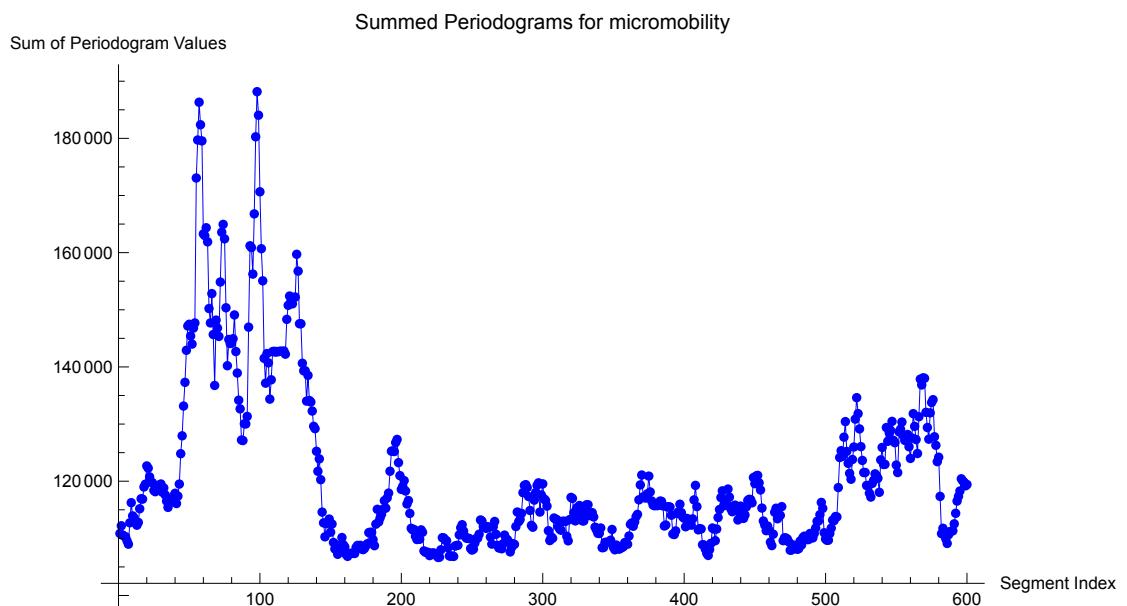
107568., 107561., 107552., 106979., 107298., 107447., 107431., 107096.,  
 107223., 106656., 106709., 108002., 110115., 110065., 109696., 109579.,  
 108367., 106922., 106887., 106899., 106839., 108659., 108742., 108793.,  
 110605., 111854., 112385., 111288., 110361., 110041., 109984., 109987.,  
 108220., 107951., 108120., 109183., 109976., 110040., 110723., 113222.,  
 113025., 112066., 112049., 111753., 112056., 111895., 110235., 108996.,  
 112030., 112957., 110706., 108754., 108312., 108692., 108175., 109062.,  
 110566., 109707., 109790., 109388., 107625., 108418., 109046., 108945.,  
 112062., 114607., 112915., 113303., 114372., 117996., 119253., 119396.,  
 118885., 117322., 114875., 112267., 111949., 116687., 118020., 119271.,  
 119712., 114601., 117605., 119535., 116904., 116646., 115637., 111338.,  
 109613., 110262., 110014., 113560., 113360., 113265., 112024., 111606.,  
 111416., 112985., 112996., 112952., 110358., 109566., 113281., 117164.,  
 116993., 114491., 113054., 115346., 113931., 115750., 114230., 113073.,  
 113043., 114782., 115884., 115887., 113985., 114430., 114490., 113741.,  
 111959., 111471., 110871., 110855., 111812., 108366., 108393., 109283.,  
 109309., 109303., 109323., 109678., 111556., 108424., 108000., 108825.,  
 108555., 108108., 108254., 108402., 108540., 109255., 109287., 108975.,  
 110410., 112450., 112699., 112118., 112888., 113800., 114193., 116743.,  
 119353., 121084., 117268., 117099., 117077., 117796., 120891., 118119.,  
 116543., 115839., 115704., 115817., 115724., 115825., 116519., 116470.,  
 115683., 112160., 112333., 115503., 115532., 115483., 114049., 110753.,  
 110670., 111300., 114347., 114635., 115973., 114510., 113733., 113516.,  
 112028., 113482., 112412., 112644., 112307., 113407., 116728., 119269.,  
 115556., 111489., 111702., 111641., 108889., 108833., 108097., 107366.,  
 107010., 108033., 109142., 111808., 111631., 109594., 111629., 113647.,  
 115042., 117139., 118313., 115698., 115892., 116598., 118628., 117215.,  
 115176., 114668., 115615., 115812., 115303., 113221., 114501., 115642.,  
 114994., 113494., 114092., 115510., 116632., 116834., 116785., 116214.,  
 120642., 119567., 120926., 121017., 119717., 118465., 115298., 113034.,  
 112324., 111345., 112155., 111430., 109334., 108729., 110725., 114565.,  
 115272., 113429., 113884., 114013., 115550., 109593., 110103., 110053.,  
 109877., 109373., 107919., 107972., 108794., 108799., 108628., 108088.,  
 108198., 109523., 108833., 110140., 110384., 109839., 109787., 109792.,  
 110846., 110847., 110079., 110841., 111814., 112986., 113034., 114145.,  
 116287., 115245., 110984., 109881., 109656., 109679., 110849., 111778.,  
 113191., 113095., 113818., 113751., 118891., 124144., 125347., 124351.,  
 127704., 130434., 125212., 123129., 121373., 120347., 123802., 125983.,  
 130860., 134620., 131826., 129155., 126049., 123634., 121512., 121526.,  
 119255., 119159., 117910., 117225., 119615., 120152., 121290., 120968.,  
 120522., 118058., 123733., 125909., 122933., 122950., 129391., 126986.,  
 128494., 128880., 130468., 127151., 126744., 122824., 121517., 128638.,  
 129097., 130353., 127986., 127140., 127140., 128173., 126031., 123985.,  
 127566., 131824., 129595., 127289., 124847., 131282., 137859., 136846.,  
 138091., 138012., 132055., 129396., 127355., 131959., 133778., 134267.,  
 127782., 126281., 123421., 124201., 117342., 110829., 111762., 111149.,  
 109924., 109110., 110644., 111186., 111253., 111321., 112545., 114388.,  
 116523 117354 118285 120422 120617 110810 110105 110424 1

```
In[=]:= (*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[=]=

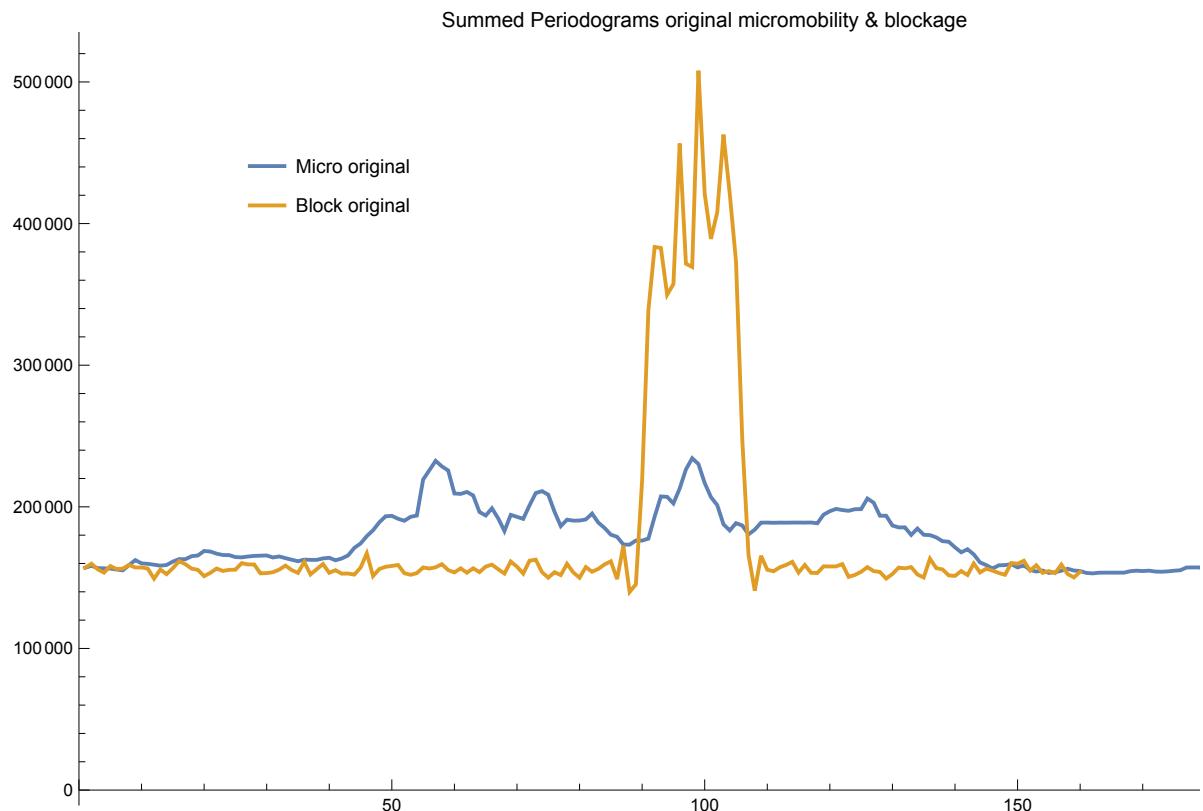


Out[=]=



```
In[]:= ListLinePlot[{sumPeriodograms1 + 46150, sumPeriodograms},  
PlotRange -> {{0, 200}, All}, PlotStyle -> {BlueGray},  
PlotLabel -> "Summed Periodograms original micromobility & blockage",  
PlotLegends -> Placed[{"Micro original", "Block original"}, {0.2, 0.8}]]
```

Out[]=



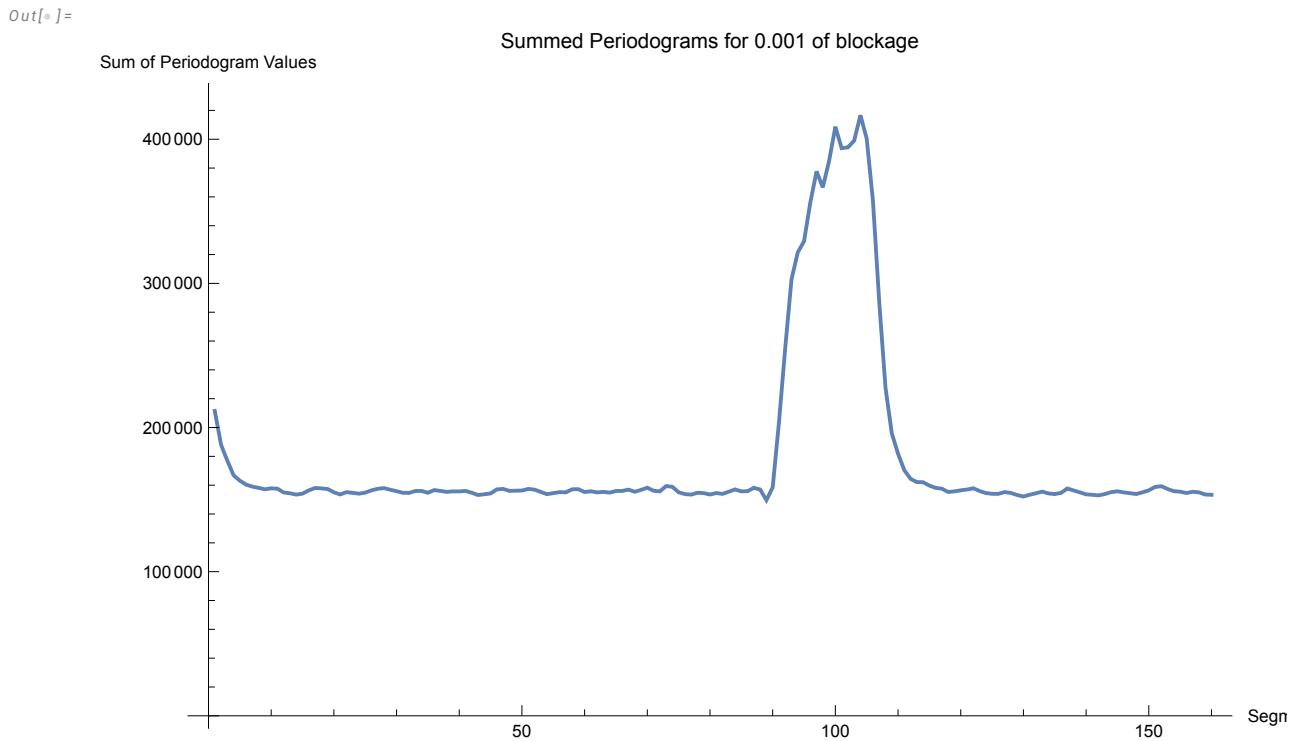
```
In[4]:= (*Initialize the list to store the sum of
periodograms with 0.001 decay rate for blockage*)
sumPeriodograms2 = {};

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

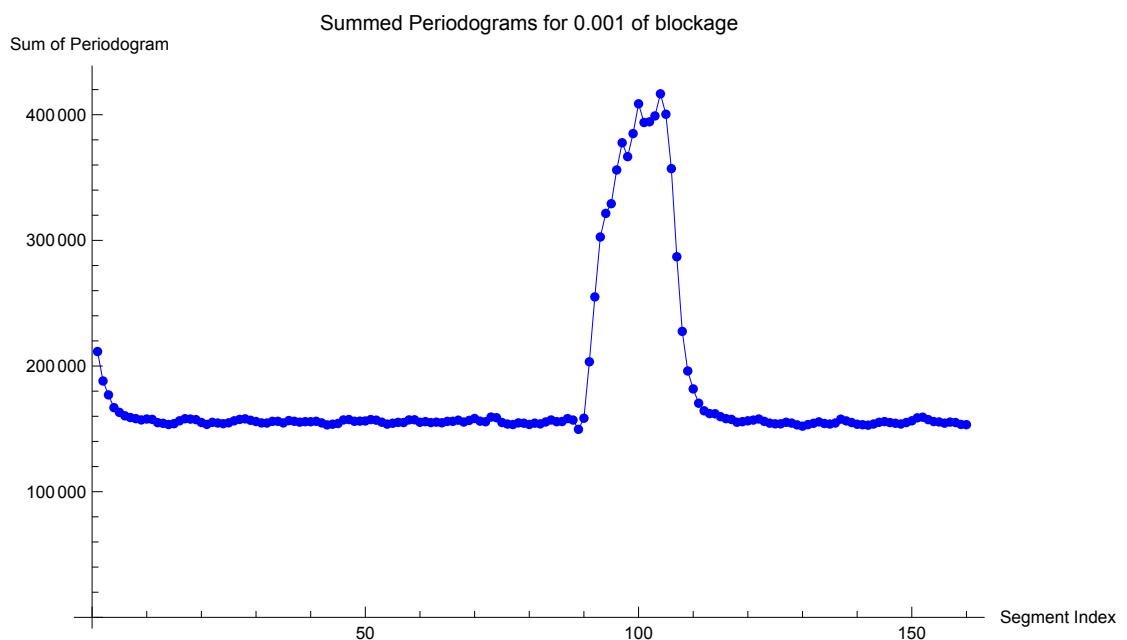
(*Loop through each segment*)
For[i = 1, i ≤ numSegments2, i++,
(*Extract the i^th segment of 500 values*)
blockSegment2 = Take[movingAvg1, {500 * (i - 1) + 1, 500 * i}];
(*Compute the periodogram for the current segment*)
periodogram2 = PeriodogramArray[blockSegment2];
(*Sum up the values of the periodogram*)
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[8]= {211545., 188097., 177028., 166887., 163123., 160396., 158995., 158134.,
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155983., 156001., 154740., 156609., 156031., 155343., 155719., 155671.,
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400388., 357087., 286973., 227564., 196057., 181796., 170401., 164381.,
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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[ ] =



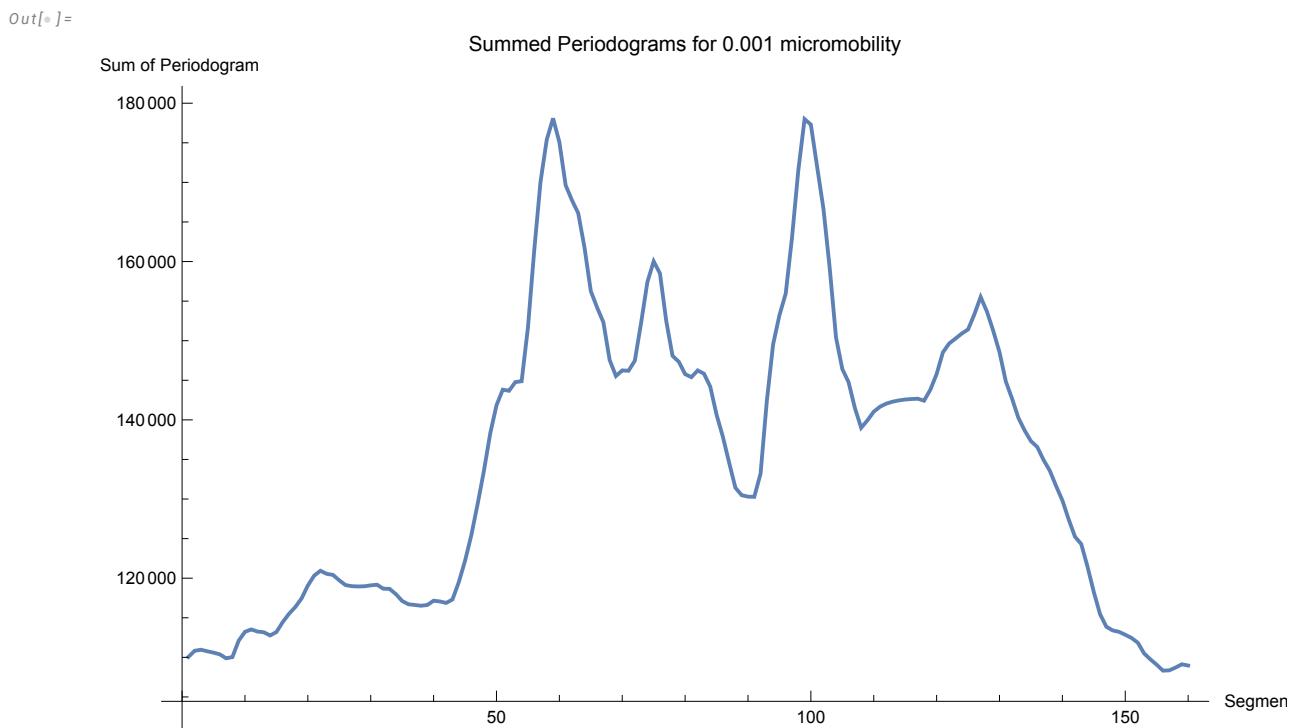
```
In[8]:= (*Initialize the list to store the sum of
periodograms with 0.001 decay rate for micromobility*)
sumPeriodograms3 = {};

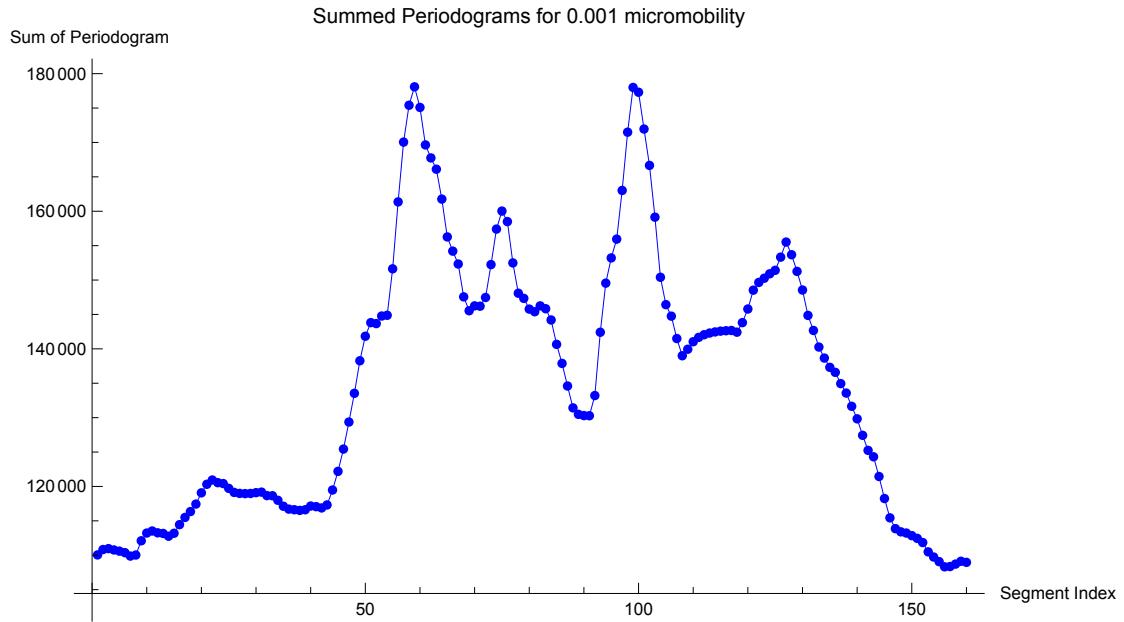
(*Calculate the number of segments*)
numSegments3 = Quotient[Length[movingAvg3], 500];

(*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];

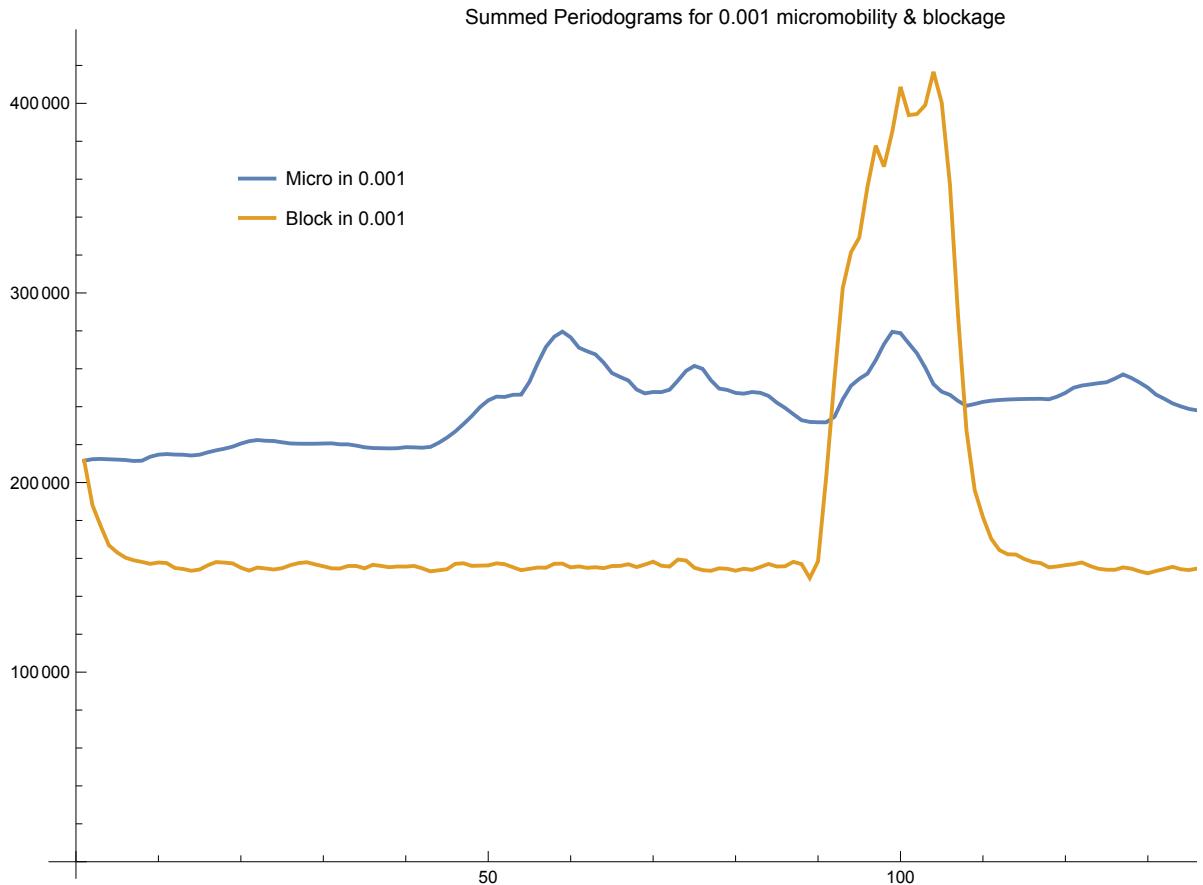
(*Output the list of summed periodograms for micromobility trace*)
sumPeriodograms3
(*Plot the summed periodograms for 0.001*)
ListLinePlot[sumPeriodograms3, PlotRange → All,
PlotLabel → "Summed Periodograms for 0.001 micromobility",
AxesLabel → {"Segment Index", "Sum of Periodogram "}]
(*Plot the summed 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[=] = {110 050., 110 828., 110 961., 110 769., 110 595., 110 379., 109 880., 110 031.,
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119 726., 119 131., 118 990., 118 958., 118 977., 119 095., 119 176., 118 671.,
118 650., 117 989., 117 123., 116 706., 116 618., 116 521., 116 614., 117 154.,
117 062., 116 875., 117 310., 119 481., 122 193., 125 433., 129 363., 133 538.,
138 267., 141 833., 143 812., 143 674., 144 773., 144 878., 151 633., 161 359.,
170 049., 175 407., 178 087., 175 090., 169 641., 167 753., 166 110., 161 767.,
156 268., 154 202., 152 332., 147 558., 145 539., 146 249., 146 200., 147 465.,
152 246., 157 405., 160 026., 158 495., 152 490., 148 084., 147 338., 145 778.,
145 395., 146 245., 145 831., 144 198., 140 654., 137 880., 134 600., 131 421.,
130 481., 130 300., 130 278., 133 211., 142 415., 149 551., 153 216., 155 948.,
163 023., 171 492., 177 995., 177 298., 171 951., 166 662., 159 140., 150 402.,
146 424., 144 751., 141 498., 138 997., 139 941., 141 034., 141 667., 142 052.,
142 298., 142 458., 142 574., 142 631., 142 672., 142 420., 143 813., 145 793.,
148 531., 149 652., 150 268., 150 907., 151 415., 153 328., 155 522., 153 678.,
151 258., 148 549., 144 860., 142 674., 140 261., 138 660., 137 314., 136 585.,
134 946., 133 573., 131 650., 129 827., 127 429., 125 243., 124 312., 121 446.,
118 244., 115 437., 113 864., 113 402., 113 227., 112 851., 112 451., 111 847.,
110 492., 109 741., 109 070., 108 320., 108 357., 108 711., 109 124., 108 968.}
```



Out[ $\circ$ ] =

```
In[ $\circ$ ] := ListLinePlot[{sumPeriodograms3 + 101 495, 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[ $\circ$ ] =

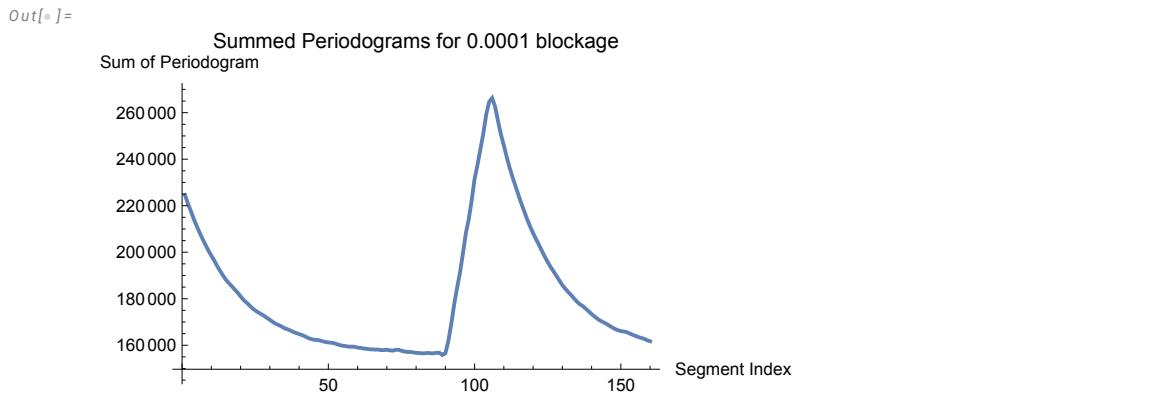
```
In[4]:= (*Initialize the list to store the sum of
periodograms with 0.0001 decay rate for blockage*)
sumPeriodograms4 = {};

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

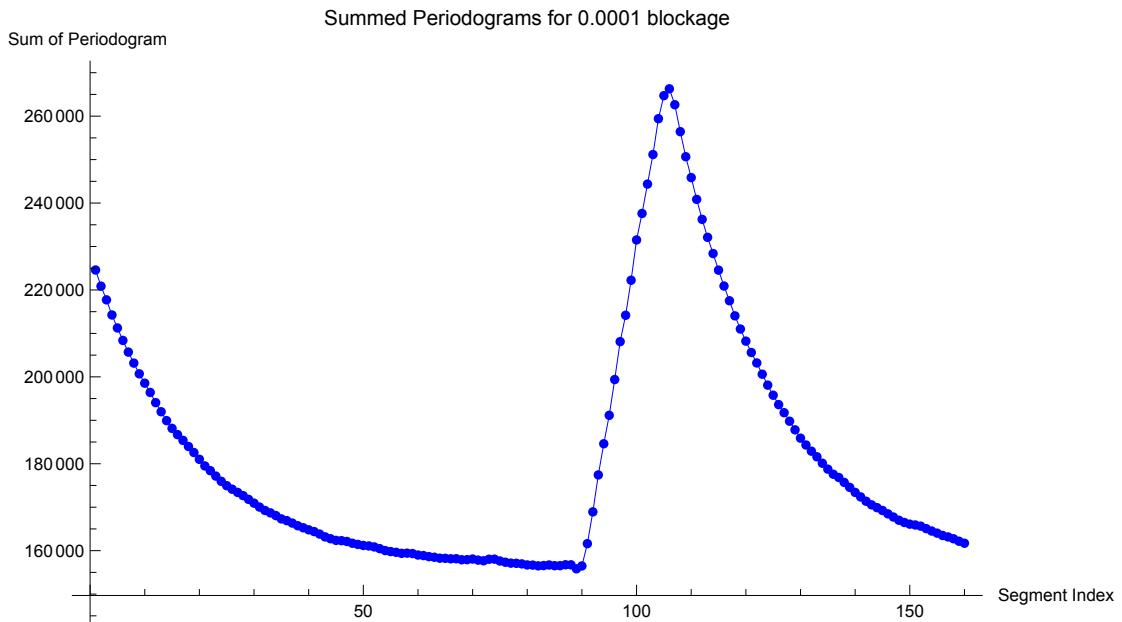
(*Loop through each segment*)
For[i = 1, i ≤ numSegments4, i++,
(*Extract the i^th segment of 500 values*)
blockSegment4 = Take[movingAvg2, {500 * (i - 1) + 1, 500 * i}];
(*Compute the periodogram for the current segment*)
periodogram4 = PeriodogramArray[blockSegment4];
(*Sum up the values of the periodogram*)
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[8]= {224595., 220873., 217723., 214243., 211257., 208389., 205702., 203166.,
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168691., 168070., 167310., 166910., 166345., 165737., 165268., 164797.,
164387., 163819., 163166., 162743., 162361., 162301., 162110., 161703.,
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156674., 156501., 156566., 156697., 156539., 156544., 156752., 156740.,
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208111., 214173., 222238., 231512., 237604., 244363., 251169., 259417.,
264720., 266293., 262631., 256436., 250670., 245861., 240849., 236242.,
232111., 228385., 224560., 220903., 217513., 214041., 211008., 208220.,
205604., 203199., 200606., 198093., 195769., 193607., 191750., 189791.,
187810., 185886., 184319., 182886., 181600., 180118., 178756., 177586.,
176841., 175706., 174570., 173407., 172368., 171366., 170546., 169897.,
169241., 168470., 167731., 167002., 166485., 166098., 165908., 165640.,
165071., 164511., 164031., 163494., 163155., 162735., 162168., 161706.}
```



*Out*[•] =



```

In[5]:= (*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

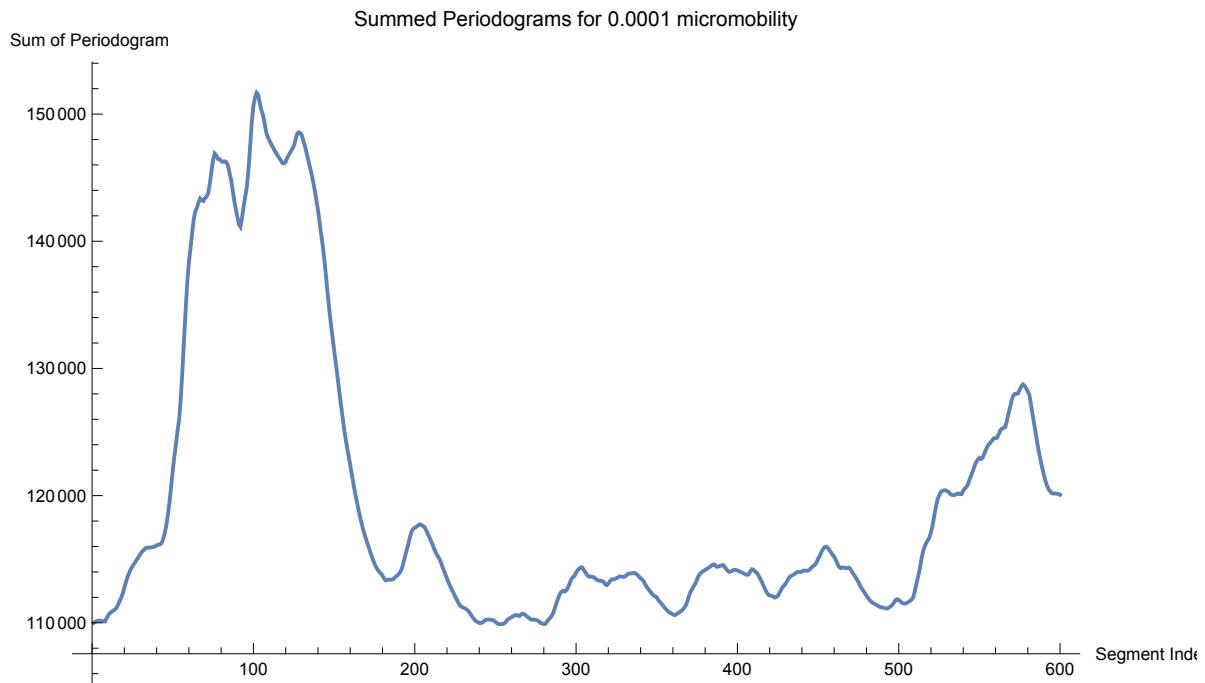
(*Plot the summed periodograms for 0.0001*)
ListLinePlot[sumPeriodograms5, PlotRange → All,
  PlotLabel → "Summed Periodograms for 0.0001 micromobility",
  AxesLabel → {"Segment Index", "Sum of Periodogram "}]
(*Plot the summed periodograms with smaller dots and thinner lines*)
ListPlot[sumPeriodograms5, 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]

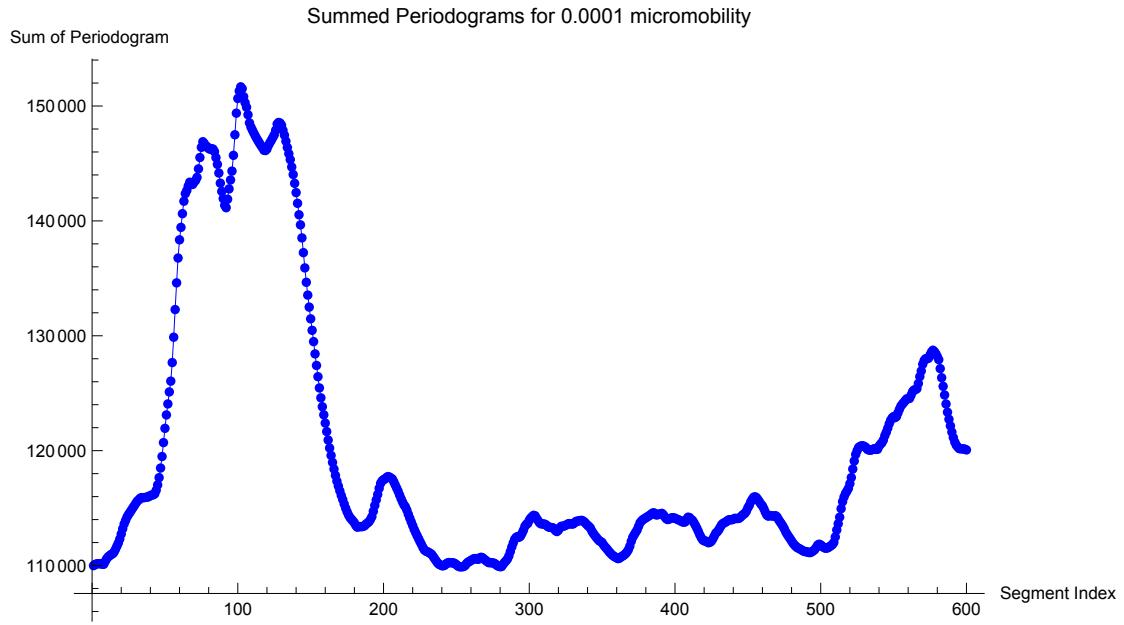
```

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124 555., 124 829., 125 130., 125 273., 125 316., 125 392., 125 847., 126 449.,
126 935., 127 526., 127 851., 128 005., 127 999., 128 051., 128 330., 128 582.,
128 741., 128 622., 128 438., 128 197., 127 919., 127 141., 126 346., 125 598.,
124 843., 124 061., 123 347., 122 733., 122 159., 121 614., 121 135., 120 752.,
120 482., 120 322., 120 183., 120 159., 120 166., 120 151., 120 125., 120 064.}
```

Out[1]=



Out[ $\circ$ ] =

```
In[ $\circ$ ] := ListLinePlot[{sumPeriodograms5, sumPeriodograms4 - 114607},
  PlotRange -> {{0, 160}, 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[ $\circ$ ] =