untitled2.mlx | untitled.mlx * | mpower.m | Acceleration | uniq_sec | final_matrix | sec | min | hr | mag | numSteps

```
clear
close all
load sensorlog_20250405_113906.mat

hr=Acceleration.Timestamp.Hour;
min=Acceleration.Timestamp.Minute;
sec=Acceleration.Timestamp.Second;

uniq_sec=((hr*3600)+(min*60)+sec);

final_matrix=[uniq_sec Acceleration.X Acceleration.Y Acceleration.Z];

plot(final_matrix(:,1),final_matrix(:,2:4));
legend('X','Y','Z');
xlabel('Relative time(s)');
ylabel('Acceleration (m/s^2)');
```

```

x= final_matrix(:,2);
y= final_matrix(:,3);
z= final_matrix(:,4);
mag= sqrt(sum(x.^2+y.^2+z.^2,2));

t=final_matrix(:,1);
figure
plot(t,mag);
xlabel('Time (s)');
ylabel('Acceleration (m/s^2)');
```

```
magNoG=mag-mean(mag);
figure
plot(t,magNoG);
xlabel('Time(s)');
ylabel('Acceleration (m/s^2)');
title('Mean subtracted');

minPeackHeight= std(magNoG);

[pks,locs]= findpeaks(magNoG,'MINPEAKHEIGHT',minPeackHeight);
numSteps= numel(pks)
```

```
hold on;
plot(t(locs),pks,'r','Marker','v','LineStyle','none');
title('Counting Steps');
xlabel('TIme (s)');
ylabel('Acceleration Magnitude, No Gravity(m/s^2)');
hold off;
```

1288×3 timetable

	Timestamp	1 X	2 Y	3 Z
	Min 05-Apr-2025 09:46:18.	Min -2.846	Min -0.54495	Min 5.361
	Max 05-Apr-2025 09:46:39.	Max 5.253	Max 7.727	Max 13.863
	Mean 05-Apr-2025 09:46:29.	Mean 0.64654	Mean 4.2565	Mean 8.8591
	Std Dev 00:00:05	Std Dev 1.1752	Std Dev 1.2677	Std Dev 0.78295
	Missing 0	Missing 0	Missing 0	Missing 0
	Class datetime	Class double	Class double	Class double
1	05-Apr-2025 09:46:18.985	-1.6010	2.7860	9.1721
2	05-Apr-2025 09:46:19.001	-1.6200	2.8249	9.0380
3	05-Apr-2025 09:46:19.017	-1.6390	2.8630	9.2480
4	05-Apr-2025 09:46:19.033	-1.6200	2.8249	9.4399
5	05-Apr-2025 09:46:19.049	-1.5240	2.8249	9.5360
6	05-Apr-2025 09:46:19.065	-1.3140	2.8630	9.6311
7	05-Apr-2025 09:46:19.081	-1.1410	2.8630	9.6120
8	05-Apr-2025 09:46:19.097	-1.0650	2.9200	9.5930
9	05-Apr-2025 09:46:19.113	-1.0070	3.0160	9.5171
10	05-Apr-2025 09:46:19.130	-0.9120	3.0739	9.2869
11	05-Apr-2025 09:46:19.146	-0.8730	3.1500	9.0380
12	05-Apr-2025 09:46:19.162	-0.7970	3.2460	9
13	05-Apr-2025 09:46:19.178	-0.7009	3.2651	9.1340
14	05-Apr-2025 09:46:19.194	-0.5860	3.2269	9.1530

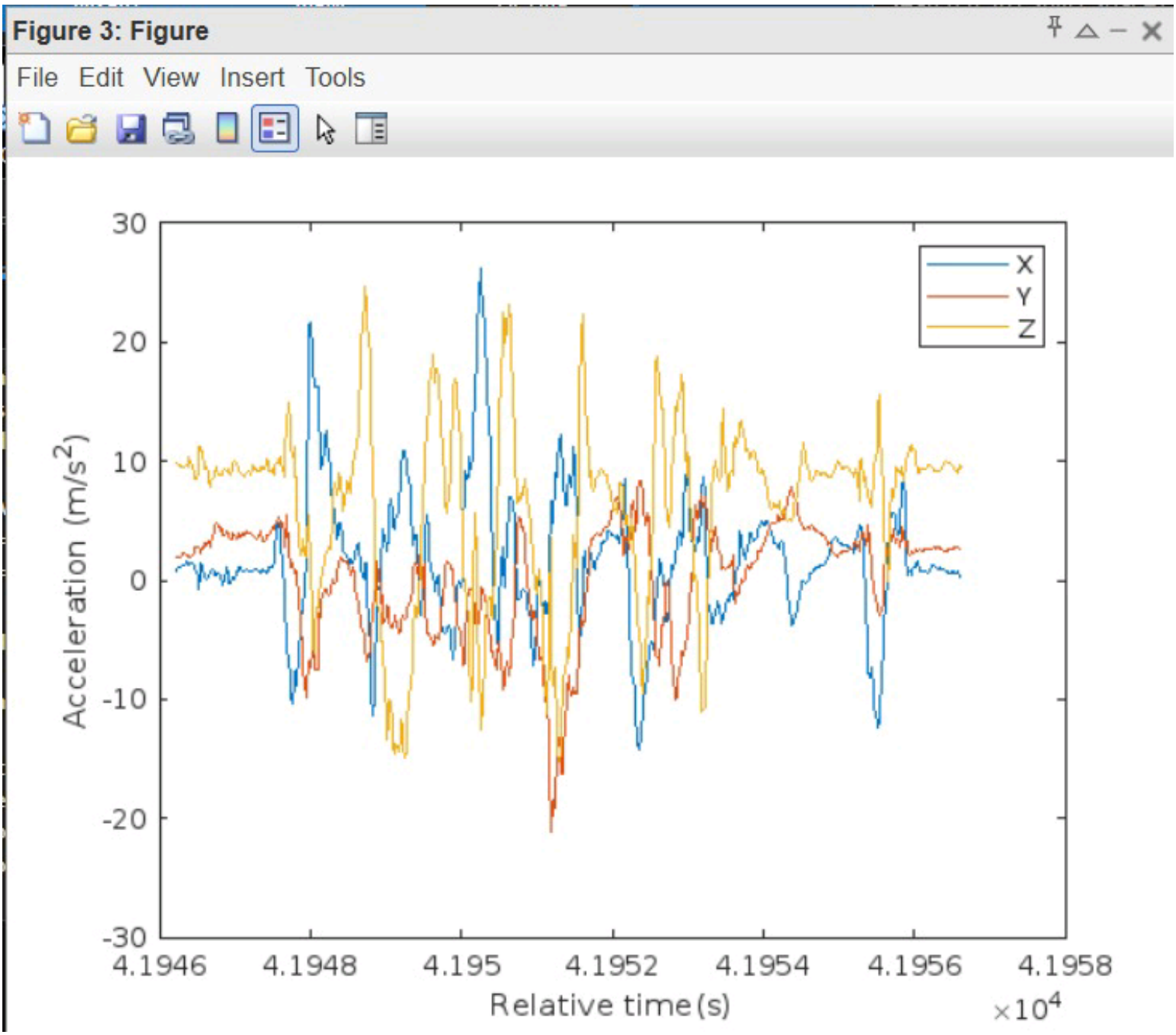


Figure 3: Figure
File Edit View Insert Tools
30
20
10
0
-10
-20
-30
Acceleration (m/s^2)
4.1946
4.1948
4.195
4.1952
4.1954
4.1956
4.1958
Relative time (s)
×10^4
X
Y
Z

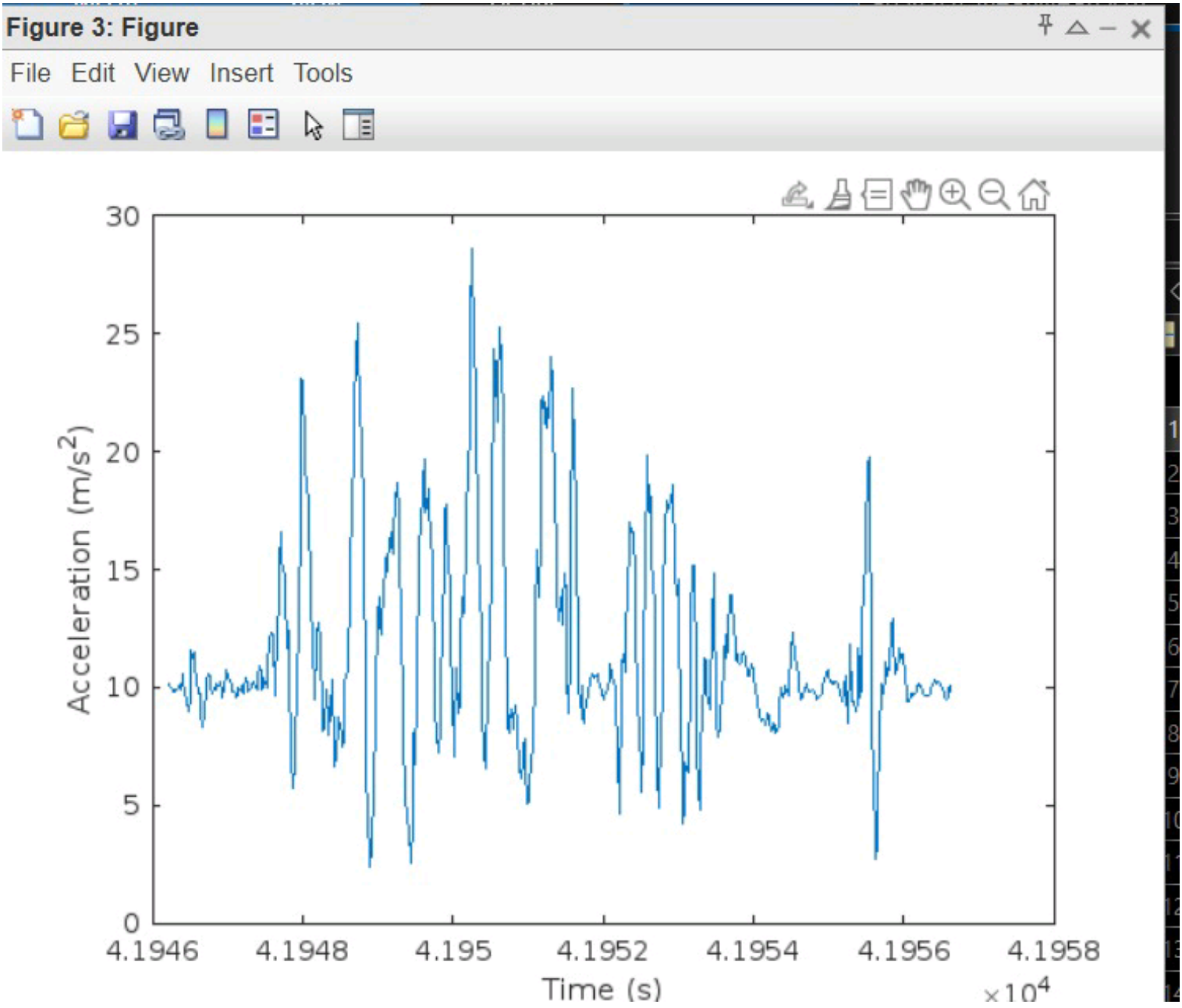


Figure 3: Figure
File Edit View Insert Tools
30
25
20
15
10
5
0
Acceleration (m/s2)
4.1946
4.1948
4.195
4.1952
4.1954
4.1956
4.1958
Time (s)
×10^4

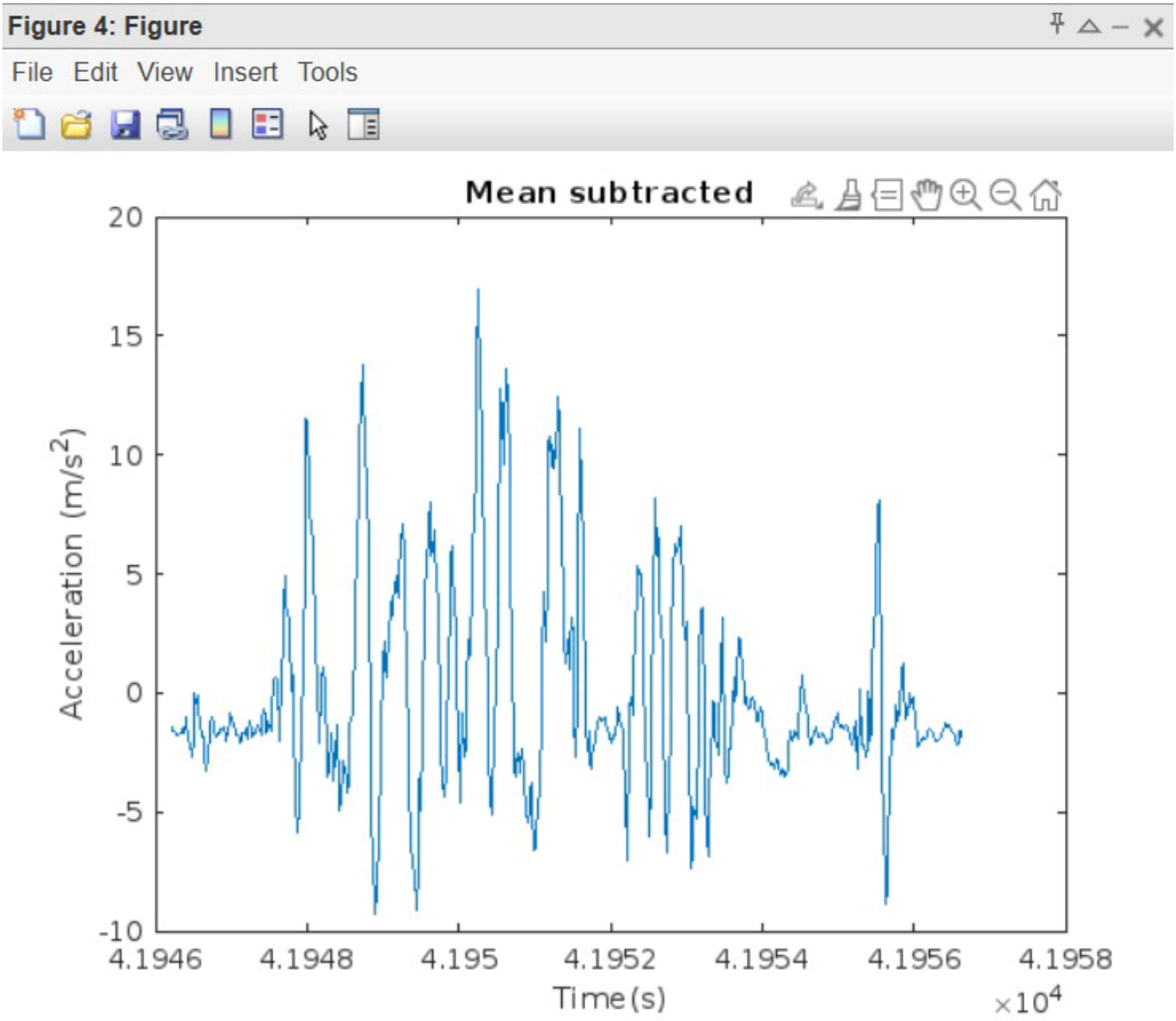
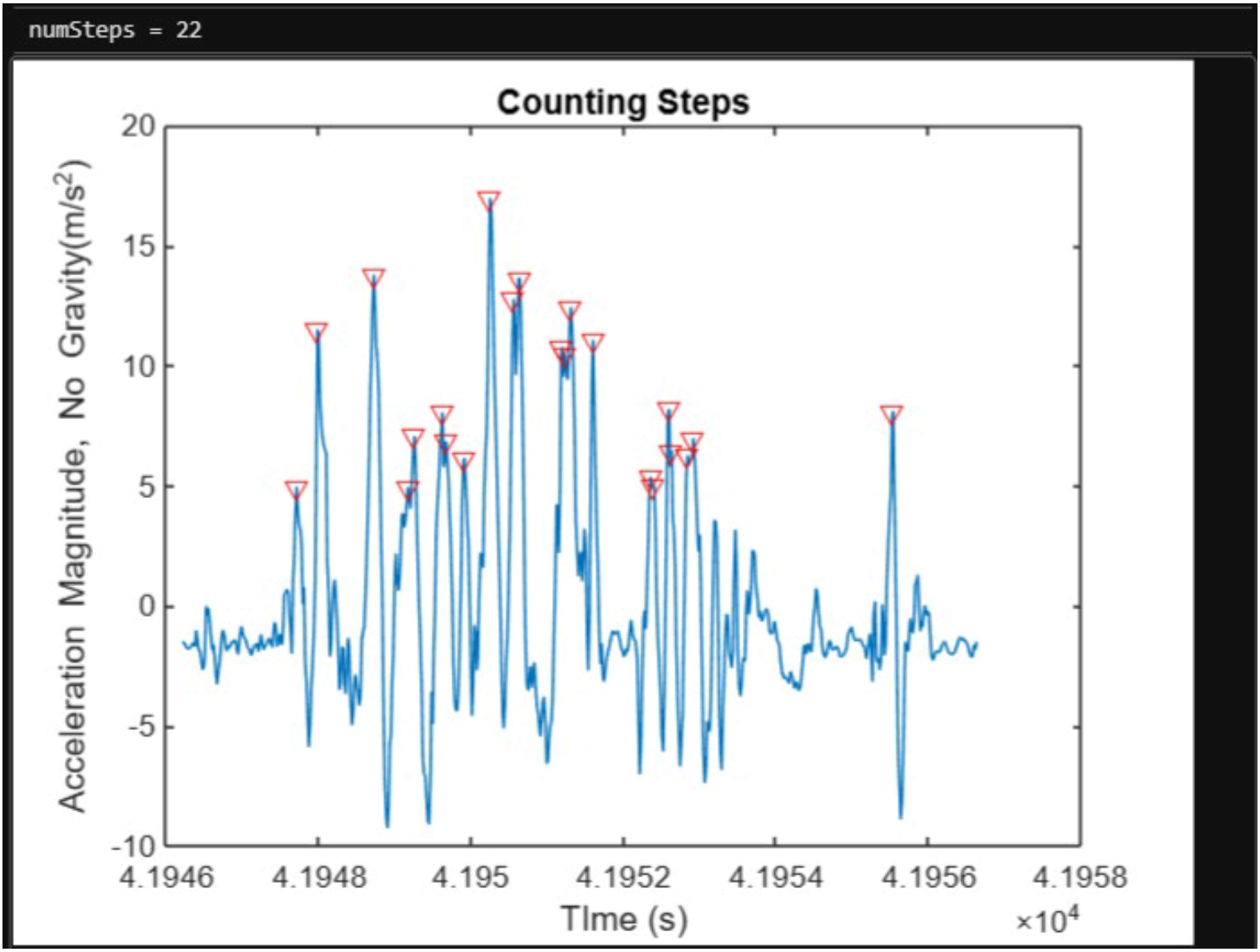


Figure 4: Figure
File Edit View Insert Tools
Mean subtracted
20
15
10
5
0
-5
-10
Acceleration (m/s^2)
4.1946
4.1948
4.195
4.1952
4.1954
4.1956
4.1958
Time (s)
×10^4

```
numSteps = 22
```


Counting Steps
Acceleration Magnitude, No Gravity(m/s²)
20
15
10
5
0
-5
-10
4.1946
4.1948
4.195
4.1952
4.1954
4.1956
4.1958
TIme (s)
×10⁴