

```
In [1]: import numpy as np
import pandas as pd
import sqlite3
import matplotlib.pyplot as plt
import matplotlib

%load_ext sql
%sql sqlite:///Event.sqlite
```

The database is imported and converted to a pandas dataframe for analysis in python and also better for

```
In [2]: cnx = sqlite3.connect(r'Event.sqlite')

# create the dataframe from the database
df = pd.read_sql_query("SELECT * FROM Event", cnx)
```

```
In [3]: df
```

Out[3]:

	ID	DateTimeEventTT	S
0	1	2020-01-01 15:17:59	
1	2	2020-01-01 15:21:38	
2	3	2020-01-01 15:23:21	
3	4	2020-01-01 15:27:01	
4	5	2020-01-01 17:32:48	
...	
39588	80833	2020-12-31 07:06:17	
39589	80834	2020-12-31 07:19:59	
39590	80835	2020-12-31 07:23:31	
39591	80836	2020-12-31 07:49:53	

ID DateTimeEventTT S

39592 80837 2020-12-31
07:53:25

```
In [4]: df.Origin == 'PyMeeus'
```

```
Out[4]: 0      False
        1      False
        2      False
        3      False
        4      False
        ...
        39588   False
        39589   False
        39590   False
        39591   False
        39592   False
        Name: Origin, Length: 3959
```

```
In [5]: sql_cmd = """
WITH
PyMeeus AS
(
SELECT DateTimeEventTT, Sa
Satellite, Type1, Type2, 1
FROM Event
WHERE Origin="PyMeeus"
),
Thuillot AS
(
SELECT DateTimeEventTT, Sa
FROM Event
WHERE Origin="Thuillot"
)

SELECT p.DateTimeEventTT,
strftime('%s', p.DateTimeE
MIN( ABS( strftime('%s', p
FROM (PyMeeus p INNER JOIN
ON p.Type = t.Type)
GROUP BY p.DateTimeEventT1
HAVING minDeltaTime <= 360

"""
df = pd.read_sql_query(sql
```

```
In [6]: df
```

```
Out[6]:
```

	DateTimeEventTT	Satellite
0	2020-01-01 15:18:23	1

28/01/2021, 20:46

	DateTimeEventTT	Satellite
1	2020-01-01 15:22:01	1
2	2020-01-01 15:23:25	1
3	2020-01-01 15:27:03	1
4	2020-01-01 17:32:16	1
...
5218	2020-12-31 07:06:17	2
5219	2020-12-31 07:19:59	1
5220	2020-12-31 07:23:31	1
5221	2020-12-31 07:49:53	1
5222	2020-12-31 07:53:25	1

```
In [7]: df['Type1'].unique()
```

```
Out[7]: array(['OM', 'PA', 'EC', ''])
```

```
In [8]: df_OM_INT= df[((df.Satellite == 2)&(df.Type1 == 'OM')) |
                        ((df.Satellite == 3)&(df.Type1 == 'PA')) |
                        ((df.Satellite == 4)&(df.Type1 == 'EC'))]
```

```
In [9]: df_OM_EXT= df[((df.Satellite == 2)&(df.Type1 == 'EC')) |
                        ((df.Satellite == 3)&(df.Type1 == 'PA')) |
                        ((df.Satellite == 4)&(df.Type1 == 'OM'))]
```

```
In [10]: df_EC_INT= df[((df.Satellite == 2)&(df.Type1 == 'EC')) |
                        ((df.Satellite == 3)&(df.Type1 == 'PA')) |
                        ((df.Satellite == 4)&(df.Type1 == 'OM'))]

df_EC_INT
```

```
Out[10]:
```

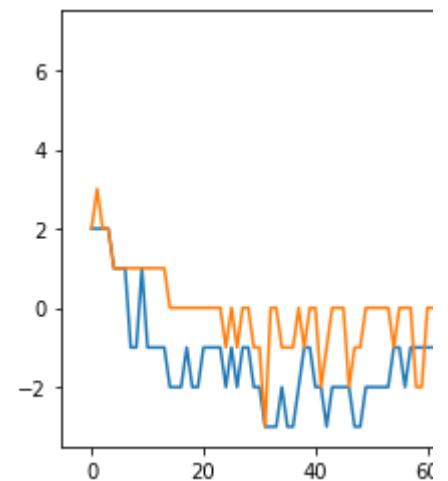
	DateTimeEventTT	Satellite
10	2020-01-01 21:04:05	2
15	2020-01-02 09:26:31	3
19	2020-01-02 12:41:37	1
41	2020-01-04 07:10:16	1
54	2020-01-05 10:21:16	2
...
4629	2020-11-19 20:46:39	3
4733	2020-11-27 00:47:08	3
4761	2020-11-28 18:24:20	4
4839	2020-12-04 04:47:41	3
5008	2020-12-15 12:32:13	4

228 rows × 7 columns

Eclipses

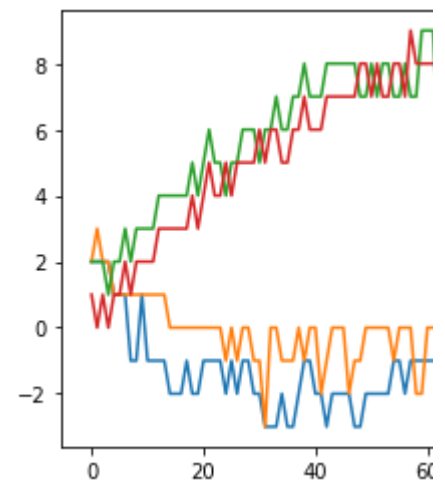
```
In [11]: df_EC_INT_I0= df[((df.Sate  
plt.plot(df_EC_INT_I0.to_r  
df_EC_EXT_I0= df[((df.Sate  
plt.plot(df_EC_EXT_I0.to_r
```

```
Out[11]: [<matplotlib.lines.Line2D
```



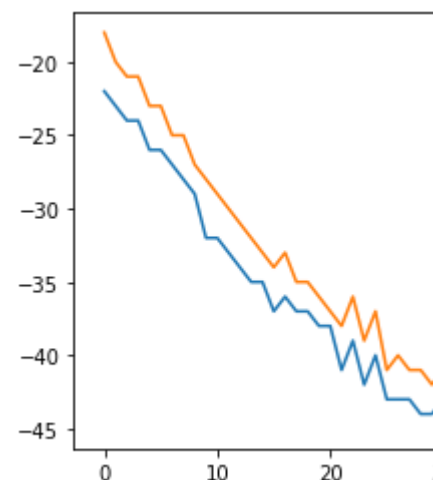
```
In [12]: df_EC_INT_I0= df[((df.Sate
plt.plot(df_EC_INT_I0.to_r
df_EC_EXT_I0= df[((df.Sate
plt.plot(df_EC_EXT_I0.to_r
df_EC_INT_I0= df[((df.Sate
plt.plot(df_EC_INT_I0.to_r
df_EC_EXT_I0= df[((df.Sate
plt.plot(df_EC_EXT_I0.to_r
```

```
Out[12]: [<matplotlib.lines.Line2D
```



```
In [13]: df_EC_INT_EUROPA= df[((df.
plt.plot(df_EC_INT_EUROPA.
df_EC_EXT_EUROPA= df[((df.
plt.plot(df_EC_EXT_EUROPA
```

```
Out[13]: [<matplotlib.lines.Line2D
```

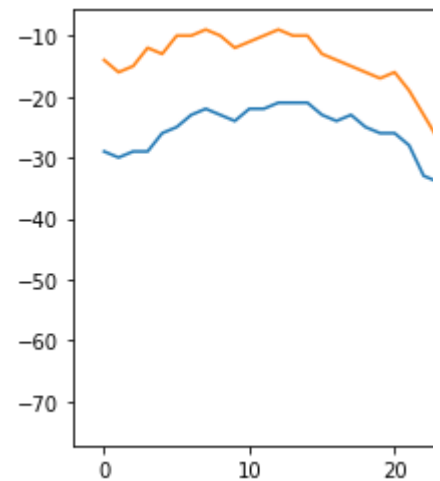


For Io and Europa there is roughly
different pahase, amplitude and fr
28/01/2021, 20:46

increasing inclination of the satellite'
 indicating that the error source mig
 axis inclination with regard to the jc

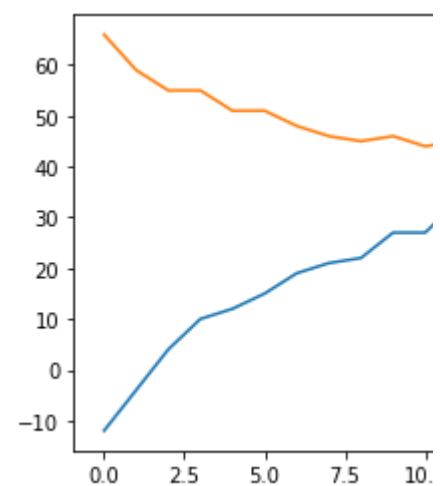
```
In [14]: df_EC_GANYMEDE= df[((df.Sa
plt.plot(df_EC_GANYMEDE.tc
df_EC_EXT_GANYMEDE= df[((c
plt.plot(df_EC_EXT_GANYMEDE
```

Out[14]: [<matplotlib.lines.Line2D



```
In [15]: df_EC_INT_CALLISTO= df[((c
plt.plot(df_EC_INT_CALLISTO
df_EC_EXT_CALLISTO= df[((c
plt.plot(df_EC_EXT_CALLISTO
```

Out[15]: [<matplotlib.lines.Line2D



Callisto's diverging pattern is some
 increasing orbital inclination, the pe
 decreases

```

In [16]: df_EC_INT_IO= df[((df.State
df_EC_INT_IO= df_EC_INT_IO
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

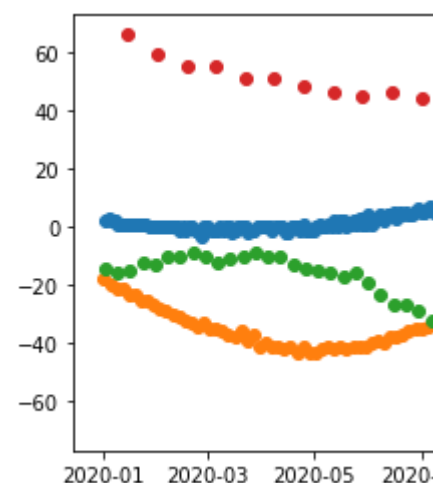
df_EC_INT_EUROPA= df[((df.
df_EC_INT_EUROPA= df_EC_IN
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_EC_INT_GANYMEDE= df[((c
df_EC_INT_GANYMEDE= df_EC_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_EC_INT_CALLISTO= df[((c
df_EC_INT_CALLISTO= df_EC_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

```

Out[16]: [<matplotlib.lines.Line2D



```

In [17]: df_EC_INT_IO= df[((df.State
df_EC_INT_IO= df_EC_INT_IO
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_EC_INT_EUROPA= df[((df.
df_EC_INT_EUROPA= df_EC_IN
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

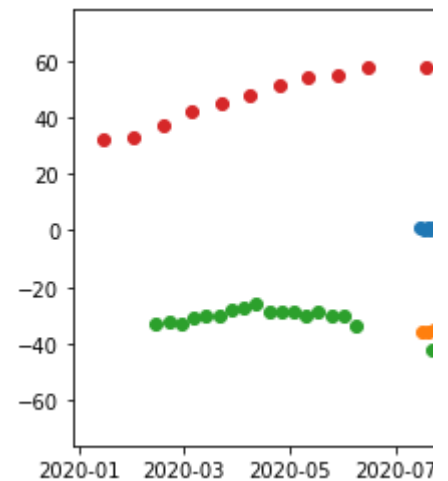
```

```

df_EC_INT_GANYMEDE= df[((c
df_EC_INT_GANYMEDE= df_EC_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_EC_INT_CALLISTO= df[((c
df_EC_INT_CALLISTO= df_EC_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
Out[17]: [<matplotlib.lines.Line2D

```



Transits

```

In [18]: df_PA_INT_IO= df[((df.Sate
df_PA_INT_IO= df_PA_INT_IO
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_PA_INT_EUROPA= df[((df.
df_PA_INT_EUROPA= df_PA_IM
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_PA_INT_GANYMEDE= df[((c
df_PA_INT_GANYMEDE= df_PA_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

df_PA_INT_CALLISTO= df[((c
df_PA_INT_CALLISTO= df_PA_

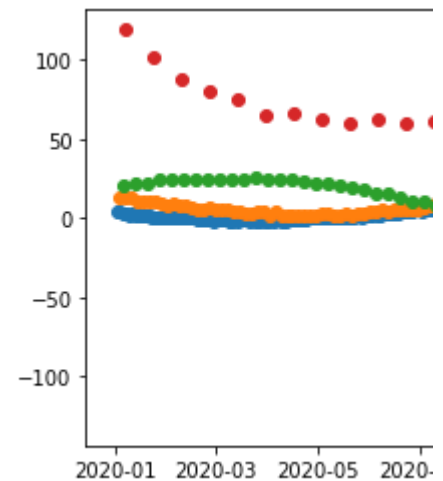
```



```

dates = matplotlib.dates.c
Out[18]: <matplotlib.lines.Line2D>

```



Again, greater offset with greater o
assumpstions relating to the umbr
assumption that jupiter's rotational
The greater error in the second sec
difference in our currently impleme
Jupiter.

Strikingy logically, one can see the
earth, thus the side with a phase cl

The curves for the begiining and er
phase on different perspective side

The fact that the variation for the si
yearly points thowards the last hyp

Not condisering the pahse correcti

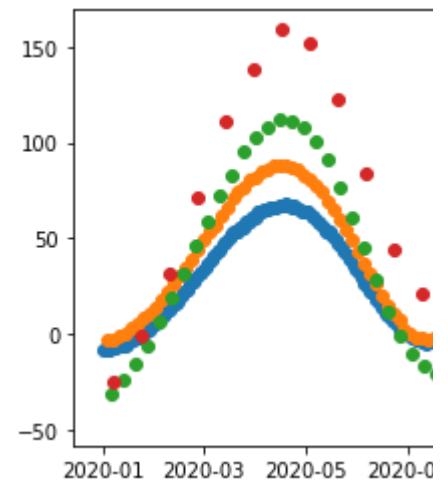
```

In [19]: df_PA_INT_IO= df[((df.Sate
df_PA_INT_IO= df_PA_INT_IC
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_PA_INT_EUROPA= df[((df.
df_PA_INT_EUROPA= df_PA_IN
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_PA_INT_GANYMEDE= df(((c
df_PA_INT_GANYMEDE= df_PA_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

```

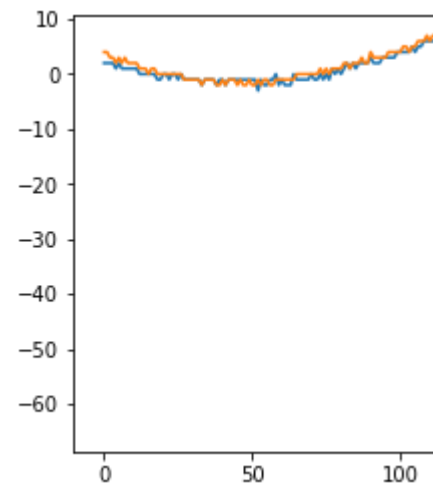
```
df_PA_INT_CALLISTO= df[((c
df_PA_INT_CALLISTO= df_PA_
dates = matplotlib.dates.c
matplotlib.pyplot.plot(dat
```

Out[19]: [



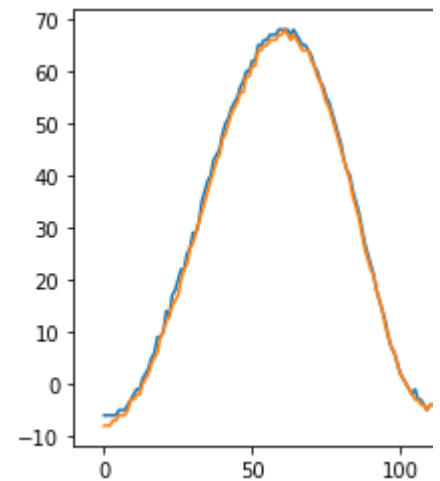
```
In [20]: df_PA_INT_I0= df[((df.Sate
plt.plot(df_PA_INT_I0.to_r
df_PA_EXT_I0= df[((df.Sate
plt.plot(df_PA_EXT_I0.to_r
```

Out[20]: [



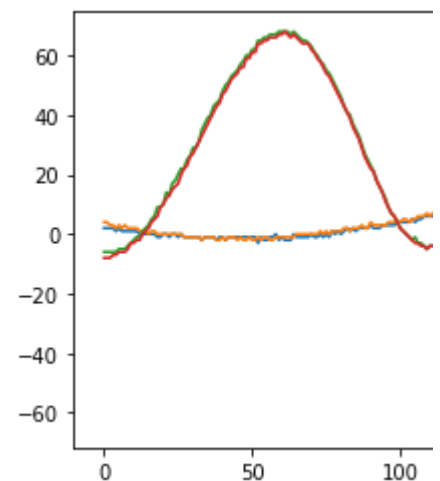
```
In [21]: df_PA_INT_I0= df[((df.Sate
plt.plot(df_PA_INT_I0.to_r
df_PA_EXT_I0= df[((df.Sate
plt.plot(df_PA_EXT_I0.to_r
```

```
Out[21]: [<matplotlib.lines.Line2D
```



```
In [22]: df_PA_INT_I0= df[((df.Sate
plt.plot(df_PA_INT_I0.to_r
df_PA_EXT_I0= df[((df.Sate
plt.plot(df_PA_EXT_I0.to_r
df_PA_INT_I0= df[((df.Sate
plt.plot(df_PA_INT_I0.to_r
df_PA_EXT_I0= df[((df.Sate
plt.plot(df_PA_EXT_I0.to_r
```

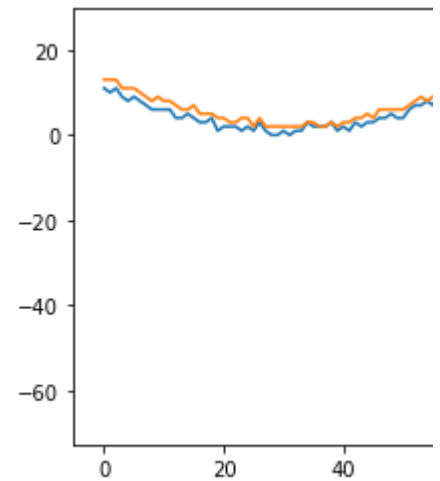
```
Out[22]: [<matplotlib.lines.Line2D
```



```
In [23]: df_PA_INT_EUROPA= df[((df.
28/01/2021, 20:46
```

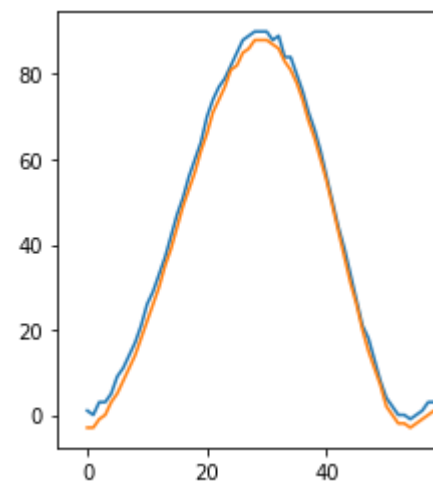
```
plt.plot(df_PA_INT_EUROPA.  
df_PA_EXT_EUROPA= df[((df.  
plt.plot(df_PA_EXT_EUROPA.
```

Out[23]: [<matplotlib.lines.Line2D



```
In [24]: df_PA_INT_EUROPA= df[((df.  
plt.plot(df_PA_INT_EUROPA.  
df_PA_EXT_EUROPA= df[((df.  
plt.plot(df_PA_EXT_EUROPA.
```

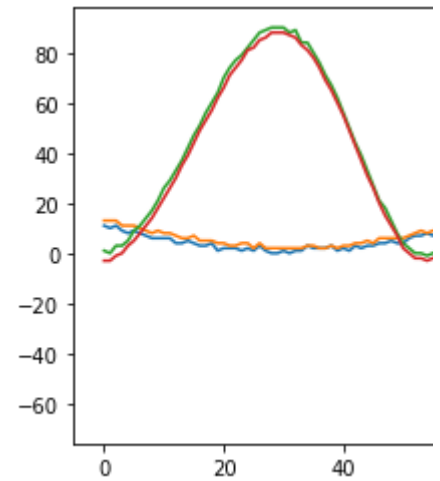
Out[24]: [<matplotlib.lines.Line2D



```
In [25]: df_PA_INT_EUROPA= df[((df.  
plt.plot(df_PA_INT_EUROPA.  
df_PA_EXT_EUROPA= df[((df.  
plt.plot(df_PA_EXT_EUROPA.  
df_PA_INT_EUROPA= df[((df.
```

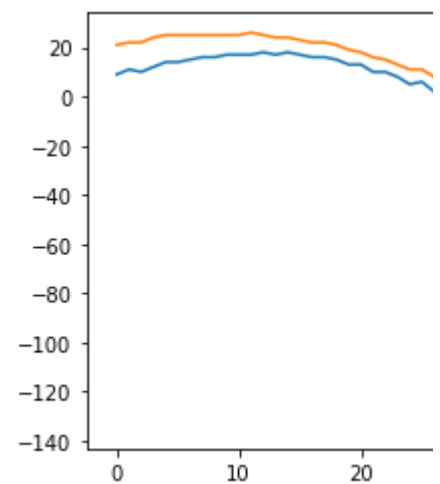
```
plt.plot(df_PA_INT_EUROPA.  
df_PA_EXT_EUROPA= df[((df.  
plt.plot(df_PA_EXT_EUROPA
```

Out[25]: [<matplotlib.lines.Line2D



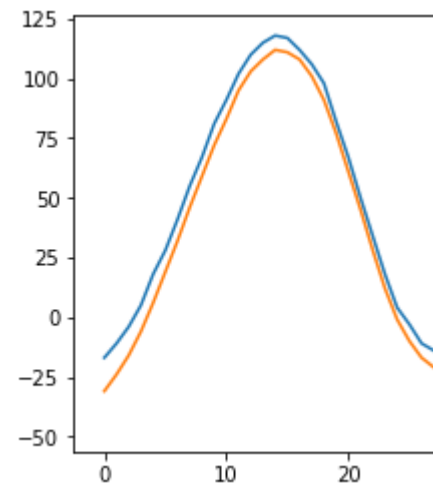
```
In [26]: df_PA_INT_GANYMEDE= df[((c  
plt.plot(df_PA_INT_GANYMEDE  
df_PA_EXT_GANYMEDE= df[((c  
plt.plot(df_PA_EXT_GANYMEDE
```

Out[26]: [<matplotlib.lines.Line2D



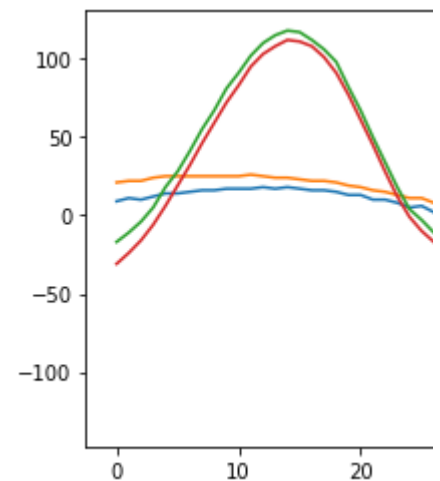
```
In [27]: df_PA_INT_GANYMEDE= df[((c
plt.plot(df_PA_INT_GANYMEDE
df_PA_EXT_GANYMEDE= df[((c
plt.plot(df_PA_EXT_GANYMEDE
```

```
Out[27]: [<matplotlib.lines.Line2D
```



```
In [28]: df_PA_INT_GANYMEDE= df[((c
plt.plot(df_PA_INT_GANYMEDE
df_PA_EXT_GANYMEDE= df[((c
plt.plot(df_PA_EXT_GANYMEDE
df_PA_INT_GANYMEDE= df[((c
plt.plot(df_PA_INT_GANYMEDE
df_PA_EXT_GANYMEDE= df[((c
plt.plot(df_PA_EXT_GANYMEDE
```

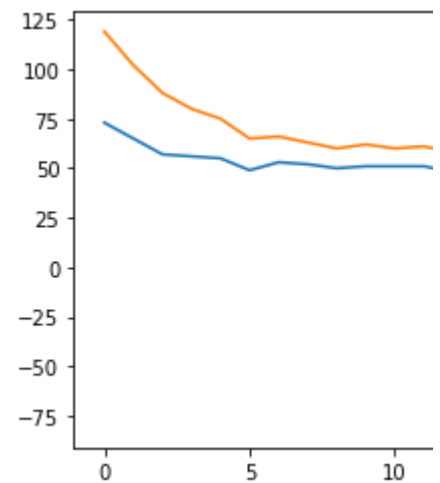
```
Out[28]: [<matplotlib.lines.Line2D
```



```
In [29]: df_PA_INT_CALLISTO= df[((c
28/01/2021, 20:46
```

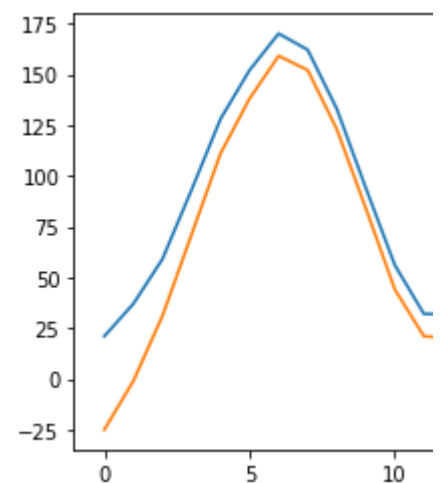
```
plt.plot(df_PA_INT_CALLIST0, df_PA_EXT_CALLIST0)
df_PA_EXT_CALLIST0 = df[((c
```

Out[29]: [<matplotlib.lines.Line2D



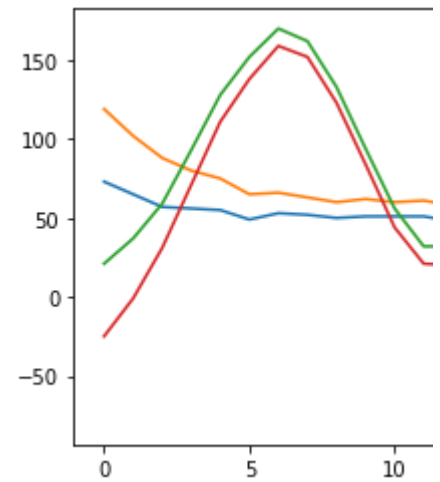
```
In [30]: df_PA_INT_CALLIST0 = df[((c
plt.plot(df_PA_INT_CALLIST0, df_PA_EXT_CALLIST0)
df_PA_EXT_CALLIST0 = df[((c
plt.plot(df_PA_EXT_CALLIST0, df_PA_INT_CALLIST0)
```

Out[30]: [<matplotlib.lines.Line2D



```
In [31]: df_PA_INT_CALLIST0 = df[((c
plt.plot(df_PA_INT_CALLIST0, df_PA_EXT_CALLIST0)
df_PA_EXT_CALLIST0 = df[((c
plt.plot(df_PA_EXT_CALLIST0, df_PA_INT_CALLIST0)
df_PA_INT_CALLIST0 = df[((c
plt.plot(df_PA_INT_CALLIST0, df_PA_EXT_CALLIST0)
```

```
df_PA_EXT_CALLISTO = df[((c  
plt.plot(df_PA_EXT_CALLISTO  
Out[31]: [ <matplotlib.lines.Line2D
```



Almost perfect correlation, the data investigated

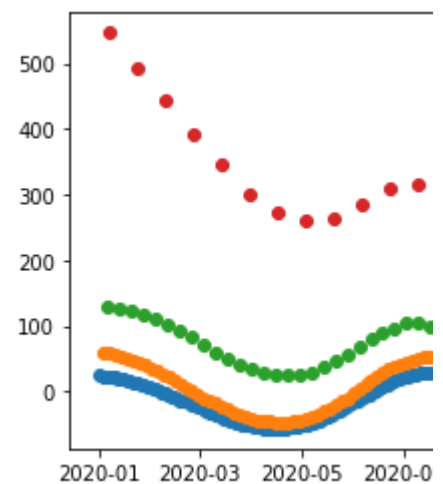
Transit of the Um


```

In [32]: df_OM_INT_IO= df[((df.Sate
df_OM_INT_IO= df_OM_INT_IC
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_OM_INT_EUROPA= df[((df.
df_OM_INT_EUROPA= df_OM_IM
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_OM_INT_GANYMEDE= df[((c
df_OM_INT_GANYMEDE= df_OM_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_OM_INT_CALLISTO= df[((c
df_OM_INT_CALLISTO= df_OM_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

```

```
Out[32]: [<matplotlib.lines.Line2D
```



```

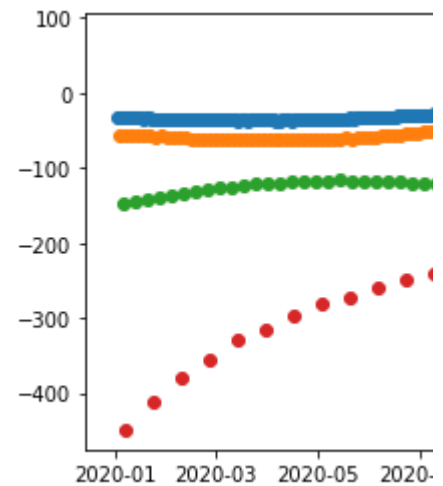
In [33]: df_OM_INT_IO= df[((df.Sate
df_OM_INT_IO= df_OM_INT_IC
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_OM_INT_EUROPA= df[((df.
df_OM_INT_EUROPA= df_OM_IM
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

```

```

df_OM_INT_GANYMEDE= df[((c
df_OM_INT_GANYMEDE= df_OM_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_OM_INT_CALLISTO= df[((c
df_OM_INT_CALLISTO= df_OM_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
Out[33]: <matplotlib.lines.Line2D

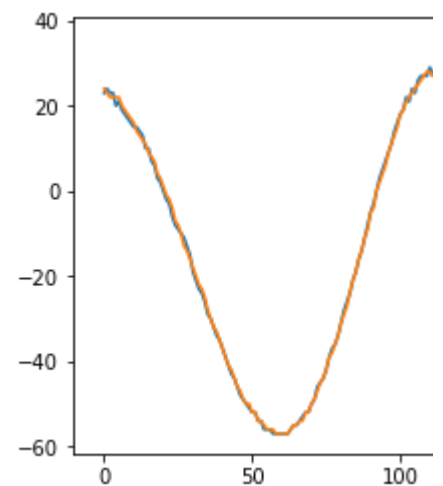
```



```

In [34]: df_OM_INT_IO= df[((df.Sate
plt.plot(df_OM_INT_IO.to_r
df_OM_EXT_IO= df[((df.Sate
plt.plot(df_OM_EXT_IO.to_r
Out[34]: <matplotlib.lines.Line2D

```



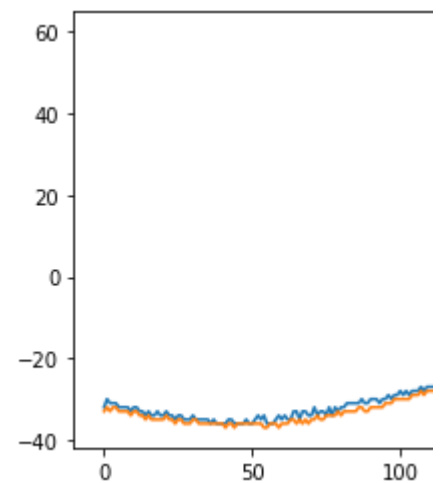
```

In [35]: df_OM_INT_IO= df[((df.Sate
plt.plot(df_OM_INT_IO.to_r

```

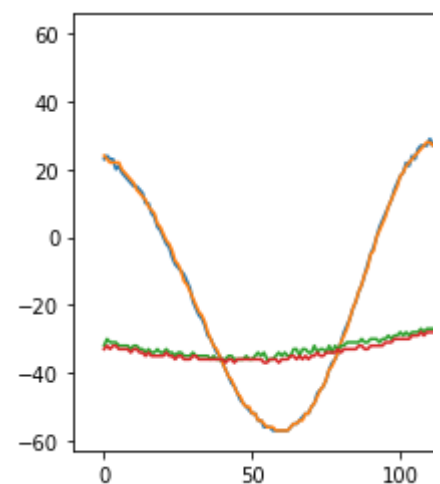
```
df_OM_EXT_IO= df[((df.State
```

```
Out[35]: <matplotlib.lines.Line2D
```



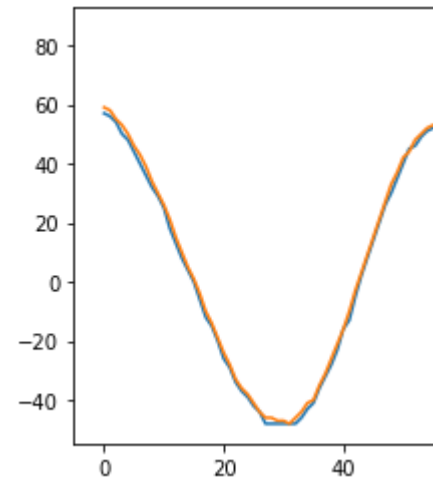
```
In [36]: df_OM_INT_IO= df[((df.State
plt.plot(df_OM_INT_IO.to_r
df_OM_EXT_IO= df[((df.State
plt.plot(df_OM_EXT_IO.to_r
df_OM_INT_IO= df[((df.State
plt.plot(df_OM_INT_IO.to_r
df_OM_EXT_IO= df[((df.State
plt.plot(df_OM_EXT_IO.to_r
```

```
Out[36]: <matplotlib.lines.Line2D
```



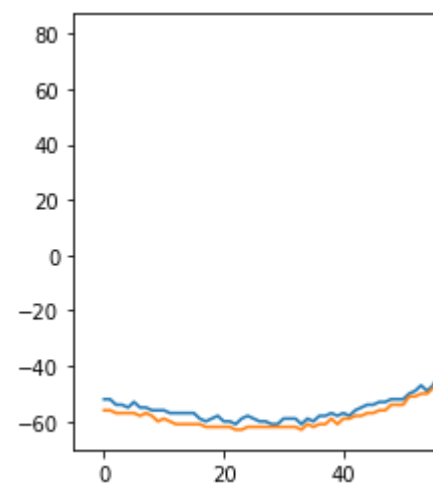
```
In [37]: df_OM_INT_EUROPA= df[((df.
plt.plot(df_OM_INT_EUROPA.
df_OM_EXT_EUROPA= df[((df.
plt.plot(df_OM_EXT_EUROPA.
```

```
Out[37]: [<matplotlib.lines.Line2D
```



```
In [38]: df_OM_INT_EUROPA= df[((df.
plt.plot(df_OM_INT_EUROPA.
df_OM_EXT_EUROPA= df[((df.
plt.plot(df_OM_EXT_EUROPA.
```

```
Out[38]: [<matplotlib.lines.Line2D
```



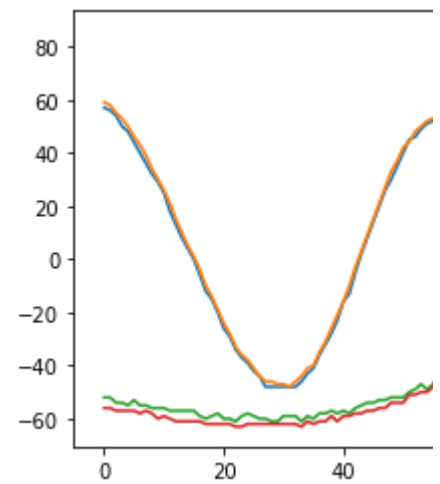
```
In [39]: df_OM_INT_EUROPA= df[((df.
plt.plot(df_OM_INT_EUROPA.
df_OM_EXT_EUROPA= df[((df.
plt.plot(df_OM_EXT_EUROPA.
```

```
df_OM_INT_EUROPA= df[((df.
```

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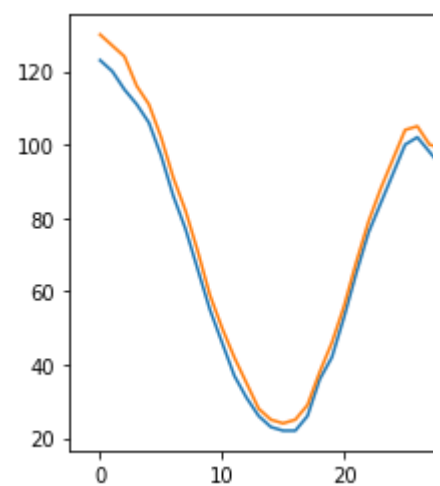
```
plt.plot(df_OM_INT_EUROPA.  
df_OM_EXT_EUROPA= df[((df.
```

Out[39]: [<matplotlib.lines.Line2D



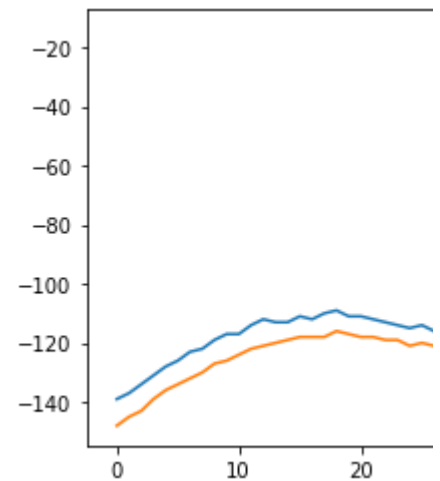
```
In [40]: df_OM_INT_GANYMEDE= df[((c  
plt.plot(df_OM_INT_GANYMEDE  
df_OM_EXT_GANYMEDE= df[((c  
plt.plot(df_OM_EXT_GANYMEDE
```

Out[40]: [<matplotlib.lines.Line2D



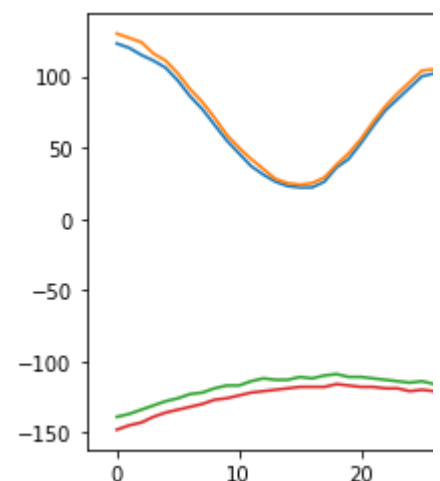
```
In [41]: df_OM_INT_GANYMEDE= df[((c
plt.plot(df_OM_INT_GANYMEDE
df_OM_EXT_GANYMEDE= df[((c
plt.plot(df_OM_EXT_GANYMEDE
```

Out[41]: [<matplotlib.lines.Line2D



```
In [42]: df_OM_INT_GANYMEDE= df[((c
plt.plot(df_OM_INT_GANYMEDE
df_OM_EXT_GANYMEDE= df[((c
plt.plot(df_OM_EXT_GANYMEDE
df_OM_INT_GANYMEDE= df[((c
plt.plot(df_OM_INT_GANYMEDE
df_OM_EXT_GANYMEDE= df[((c
plt.plot(df_OM_EXT_GANYMEDE
```

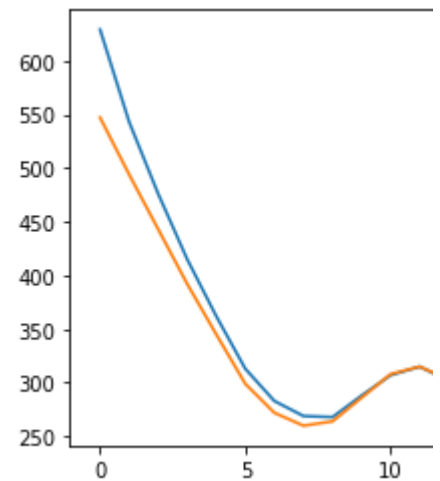
Out[42]: [<matplotlib.lines.Line2D



In []:

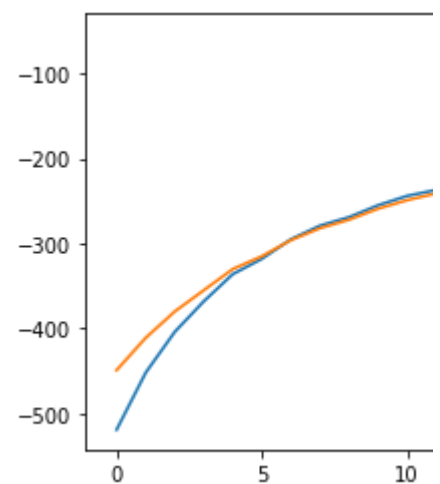
```
In [43]: df_OM_INT_CALLIST0= df[((c
plt.plot(df_OM_INT_CALLIST1
df_OM_EXT_CALLIST0= df[((c
plt.plot(df_OM_EXT_CALLIST1
```

```
Out[43]: [<matplotlib.lines.Line2D
```



```
In [44]: df_OM_INT_CALLIST0= df[((c
plt.plot(df_OM_INT_CALLIST1
df_OM_EXT_CALLIST0= df[((c
plt.plot(df_OM_EXT_CALLIST1
```

```
Out[44]: [<matplotlib.lines.Line2D
```

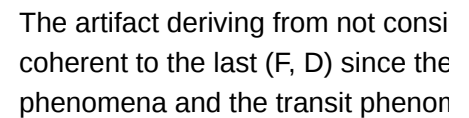


```
In [45]: df_OM_INT_CALLIST0= df[((c
plt.plot(df_OM_INT_CALLIST1
df_OM_EXT_CALLIST0= df[((c
plt.plot(df_OM_EXT_CALLIST1
```

```
df_OM_INT_CALLIST0= df[((c
```

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```
Out[45]: 7<matplotlib.figure.Figure(416x267
```

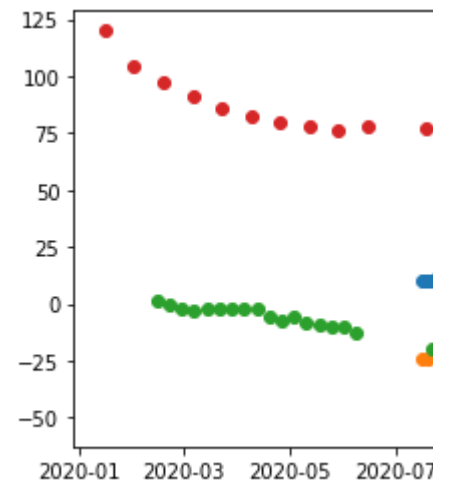


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```
dates = matplotlib.dates.c  
matplotlib.pyplot.plot(dat
```

Out[46]: [<matplotlib.lines.Line2D

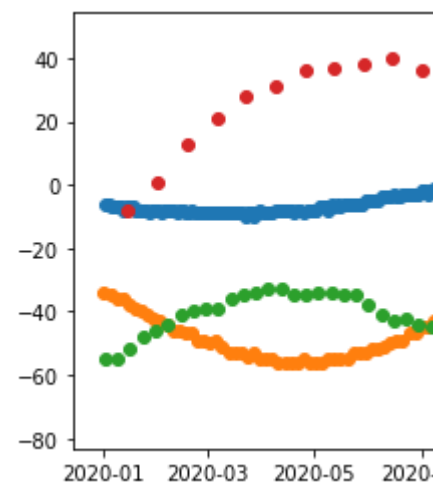


```

In [47]: df_EC_INT_I0= df[((df.Sate
df_EC_INT_I0= df_EC_INT_IC
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_EC_INT_EUROPA= df[((df.
df_EC_INT_EUROPA= df_EC_IM
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_EC_INT_GANYMEDE= df[((c
df_EC_INT_GANYMEDE= df_EC_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat
df_EC_INT_CALLISTO= df[((c
df_EC_INT_CALLISTO= df_EC_
dates = matplotlib.dates.c
matplotlib.pyplot.plot_dat

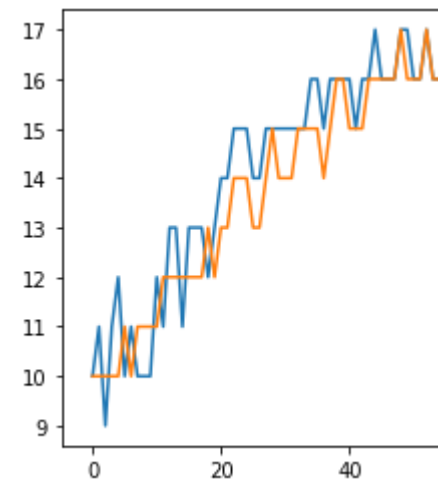
```

```
Out[47]: [<matplotlib.lines.Line2D
```



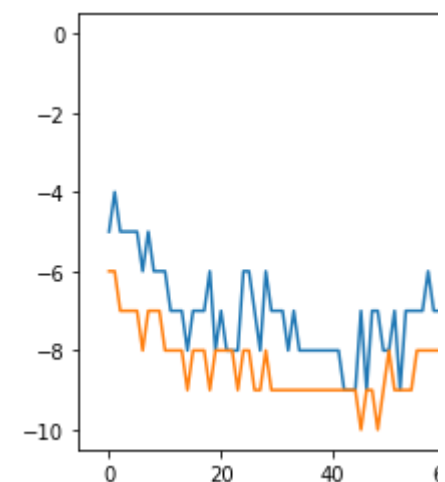
```
In [48]: df_EC_INT_I0= df[((df.Sate
plt.plot(df_EC_INT_I0.to_r
df_EC_EXT_I0= df[((df.Sate
plt.plot(df_EC_EXT_I0.to_r
```

Out[48]: [<matplotlib.lines.Line2D



```
In [49]: df_EC_INT_I0= df[((df.Sate
plt.plot(df_EC_INT_I0.to_r
df_EC_EXT_I0= df[((df.Sate
plt.plot(df_EC_EXT_I0.to_r
```

Out[49]: [<matplotlib.lines.Line2D

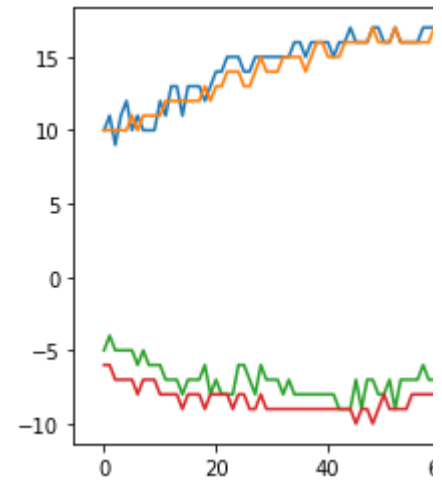


```
In [50]: df_EC_INT_I0= df[((df.Sate
plt.plot(df_EC_INT_I0.to_r
df_EC_EXT_I0= df[((df.Sate
plt.plot(df_EC_EXT_I0.to_r
```

df_EC_INT_I0= df[((df.Sate
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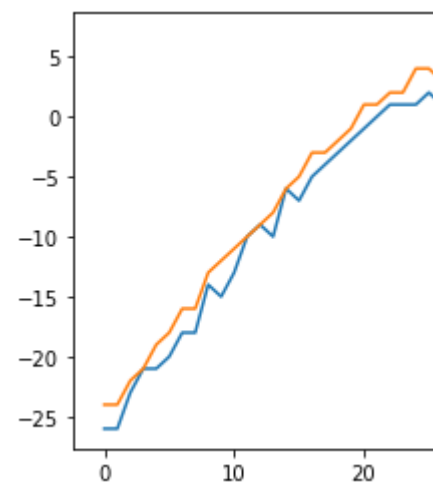
```
plt.plot(df_EC_INT_I0.to_r
df_EC_EXT_I0= df[((df.Sate
```

Out[50]: <matplotlib.figure.Figure: 5 Line2D



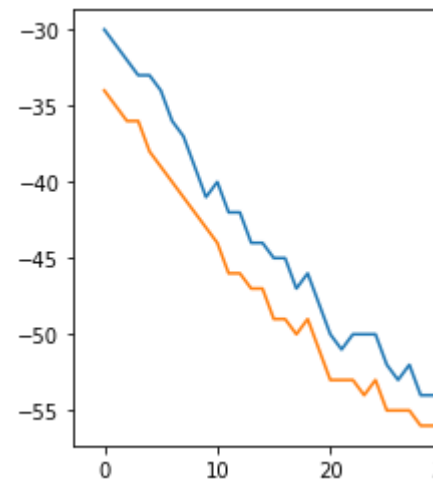
```
In [51]: df_EC_INT_EUROPA= df[((df.
plt.plot(df_EC_INT_EUROPA.
df_EC_EXT_EUROPA= df[((df.
plt.plot(df_EC_EXT_EUROPA
```

Out[51]: [<matplotlib.lines.Line2D



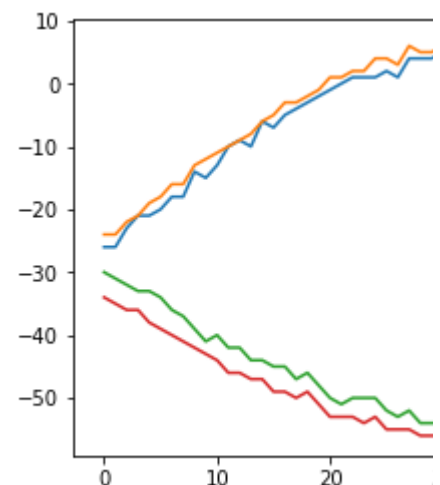
```
In [52]: df_EC_INT_EUROPA= df[((df.
plt.plot(df_EC_INT_EUROPA.
df_EC_EXT_EUROPA= df[((df.
plt.plot(df_EC_EXT_EUROPA
```

```
Out[52]: [<matplotlib.lines.Line2D
```



```
In [53]: df_EC_INT_EUROPA= df[((df.
plt.plot(df_EC_INT_EUROPA.
df_EC_EXT_EUROPA= df[((df.
plt.plot(df_EC_EXT_EUROPA.
df_EC_INT_EUROPA= df[((df.
plt.plot(df_EC_INT_EUROPA.
df_EC_EXT_EUROPA= df[((df.
plt.plot(df_EC_EXT_EUROPA
```

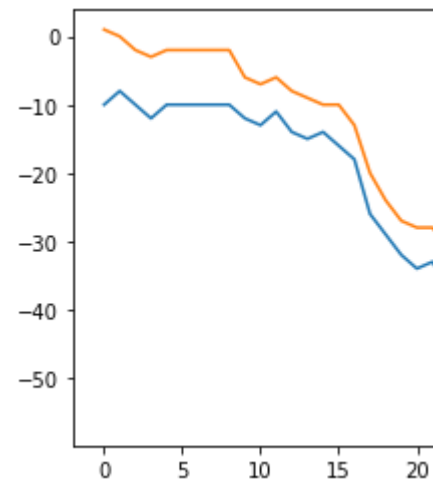
```
Out[53]: [<matplotlib.lines.Line2D
```



```
In [54]: df_EC_INT_GANYMEDE= df[((df.
plt.plot(df_EC_INT_GANYMEDE.
df_EC_EXT_GANYMEDE= df[((df.
plt.plot(df_EC_EXT_GANYMEDE
```

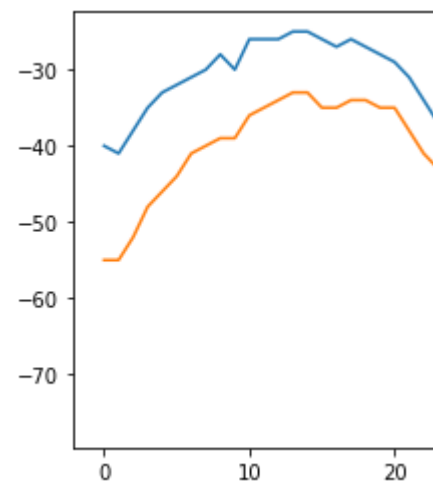
```
plt.plot(df_EC_INT_GANYMEDE)
df_EC_EXT_GANYMEDE= df[((c
```

Out[54]: plt.plot(df_EC_EXT_GANYMEDE)
[<matplotlib.lines.Line2D



```
In [55]: df_EC_INT_GANYMEDE= df[((c
plt.plot(df_EC_INT_GANYMEDE)
df_EC_EXT_GANYMEDE= df[((c
plt.plot(df_EC_EXT_GANYMEDE)
```

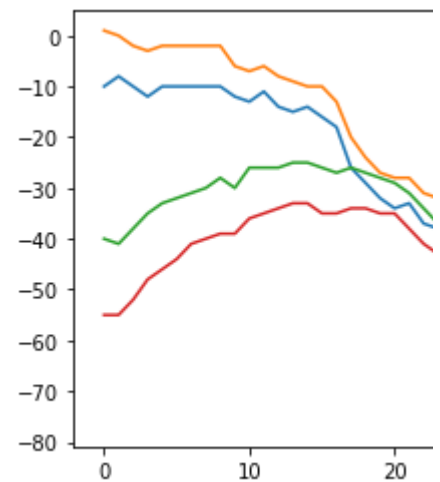
Out[55]: [<matplotlib.lines.Line2D



```
In [56]: df_EC_INT_GANYMEDE= df[((c
plt.plot(df_EC_INT_GANYMEDE)
df_EC_EXT_GANYMEDE= df[((c
plt.plot(df_EC_EXT_GANYMEDE)
df_EC_INT_GANYMEDE= df[((c
plt.plot(df_EC_INT_GANYMEDE)
```

```
df_EC_EXT_GANYMEDE= df[((c
plt.plot(df_EC_EXT_GANYMEDE
```

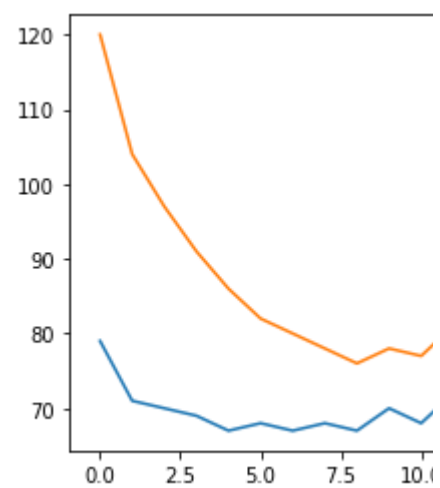
Out[56]: [<matplotlib.lines.Line2D



In []:

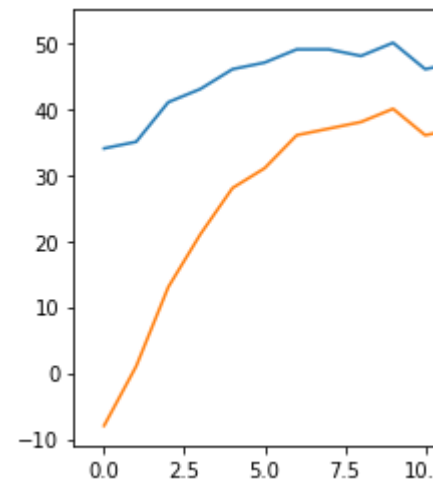
```
In [57]: df_EC_INT_CALLIST0= df[((c
plt.plot(df_EC_INT_CALLIST0
df_EC_EXT_CALLIST0= df[((c
plt.plot(df_EC_EXT_CALLIST0
```

Out[57]: [<matplotlib.lines.Line2D



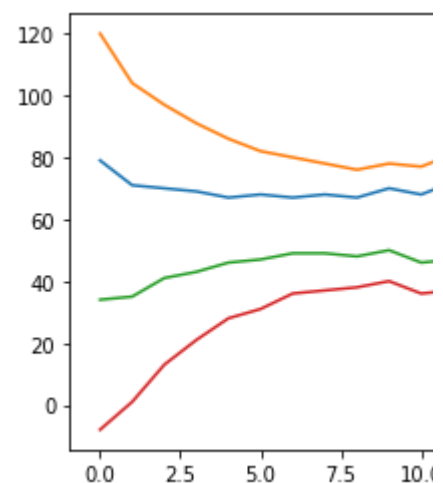
```
In [58]: df_EC_INT_CALLIST0= df[((c
plt.plot(df_EC_INT_CALLIST0
df_EC_EXT_CALLIST0= df[((c
plt.plot(df_EC_EXT_CALLIST0
```

```
Out[58]: [<matplotlib.lines.Line2D
```



```
In [59]: df_OC_INT_CALLIST0= df[((c
plt.plot(df_OC_INT_CALLIST0
df_OC_EXT_CALLIST0= df[((c
plt.plot(df_OC_EXT_CALLIST0
df_OC_INT_CALLIST0= df[((c
plt.plot(df_OC_INT_CALLIST0
df_OC_EXT_CALLIST0= df[((c
plt.plot(df_OC_EXT_CALLIST0
```

```
Out[59]: [<matplotlib.lines.Line2D
```



correlation of the abs() ob the varia
present. No further artifact due to a

In []: