# smsr_osc_compare_Svet1

May 6, 2024

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

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```
#    :          ,         -1
#                   ,   :
Pnom1=107
#                csv
df_sk = pd.read_csv('./Svet/Svet_results_data.csv', sep=';', encoding="ansi",␣
 ↪decimal=',')
df_sk.columns = ["TimeUTC",
                 "G1_def", "G1_def_P", "G1_def_Q", "G1_def_P_amp",␣
 ↪"G1_def_P_freq","G1_def_Q_amp", "G1_def_Q_freq",
                 "G2_def", "G2_def_P", "G2_def_Q", "G2_def_P_amp",␣
 ↪"G2_def_P_freq","G2_def_Q_amp", "G2_def_Q_freq",
                 "G3_def", "G3_def_P", "G3_def_Q", "G3_def_P_amp",␣
 ↪"G3_def_P_freq","G3_def_Q_amp", "G3_def_Q_freq"]
df_sk["time"] = ((pd.to_datetime(df_sk["TimeUTC"]).astype('int64') / 1e6 -␣
 ↪float(pd.to_datetime(df_sk["TimeUTC"][0]).to_datetime64()) / 1e6).
 ↪astype('int64')) / 1e3
#                csv
df_ext = pd.read_csv('./Svet/SMSR_SIG_EXT_data_Svet_1.csv', sep=';',␣
 ↪encoding="windows-1251")
#           diagno                    (              df_ext)
diagno = df_ext[["osh_ARV1_ext[6]", "osh_ARV1_ext[7]", "osh_ARV1_ext[8]",␣
 ↪"osh_ARV1_ext[9]", "osh_ARV1_ext[10]"]]
diagno.columns = ["bug1", "bug2", "bug3", "bug4", "bug5"]
#           result_osc                              (              df_ext)
results = df_ext[["osh_ARV1_ext[{:d}]".format(i) for i in range(11, 25)]]
results.columns = ["osc1_f", "osc1_phi", "osc1_np", "osc2_f", "osc2_phi",␣
 ↪"osc2_np", "osc3_f", "osc3_phi", "osc3_np", "osc4_f", "osc4_phi", "osc4_np",␣
 ↪"osc5_f", "osc5_amp"]
#           osh                               (              df_ext)
osh = df_ext[["osh_ARV1_ext[1]", "osh_ARV1_ext[2]", "osh_ARV1_ext[3]",␣
 ↪"osh_ARV1_ext[4]", "osh_ARV1_ext[5]"]]
osh.columns = ["osc1", "osc2", "osc3", "osc4", "osc5"]
```

```
C:\Users\das\AppData\Local\Temp\ipykernel_15460\808605530.py:10: UserWarning:
```

```
Parsing dates in %d.%m.%Y %H:%M:%S.%f format when dayfirst=False (the default)
was specified. Pass `dayfirst=True` or specify a format to silence this warning.
  df_sk["time"] = ((pd.to_datetime(df_sk["TimeUTC"]).astype('int64') / 1e6 -
float(pd.to_datetime(df_sk["TimeUTC"][0]).to_datetime64()) /
1e6).astype('int64')) / 1e3
C:\Users\das\AppData\Local\Temp\ipykernel_15460\808605530.py:10: UserWarning:
Parsing dates in %d.%m.%Y %H:%M:%S.%f format when dayfirst=False (the default)
was specified. Pass `dayfirst=True` or specify a format to silence this warning.
  df_sk["time"] = ((pd.to_datetime(df_sk["TimeUTC"]).astype('int64') / 1e6 -
float(pd.to_datetime(df_sk["TimeUTC"][0]).to_datetime64()) /
1e6).astype('int64')) / 1e3
```

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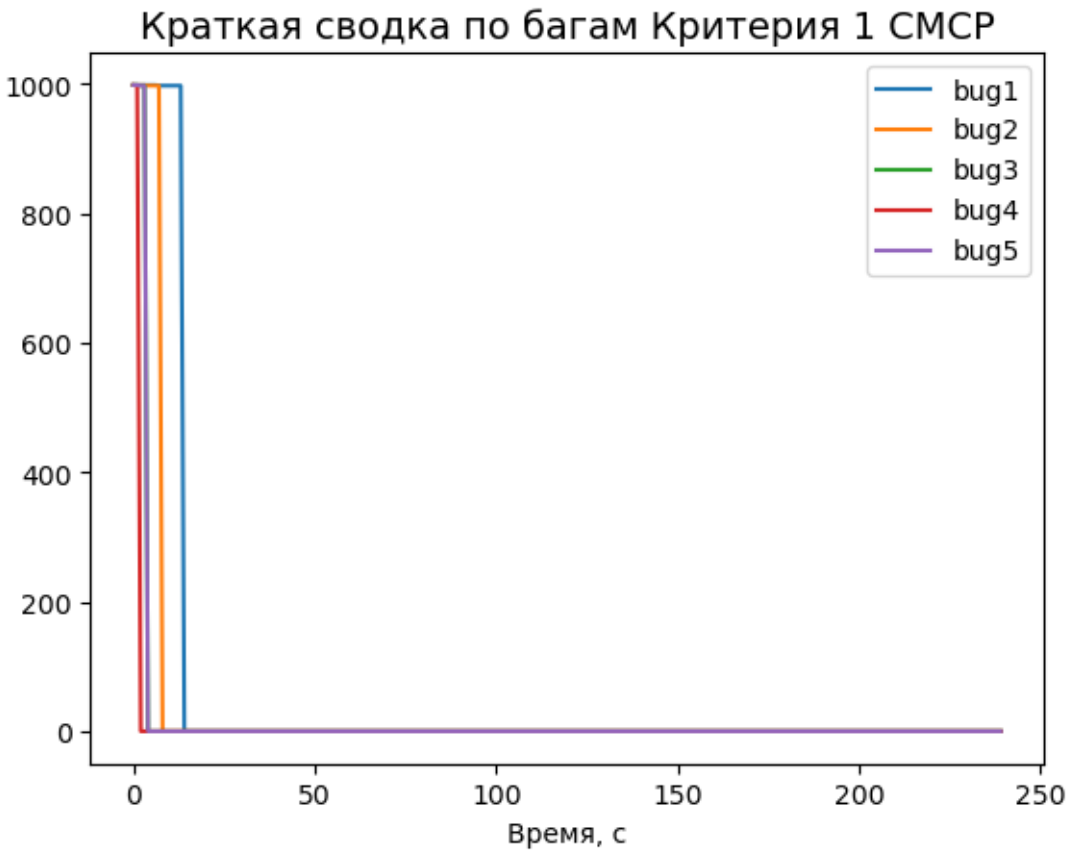
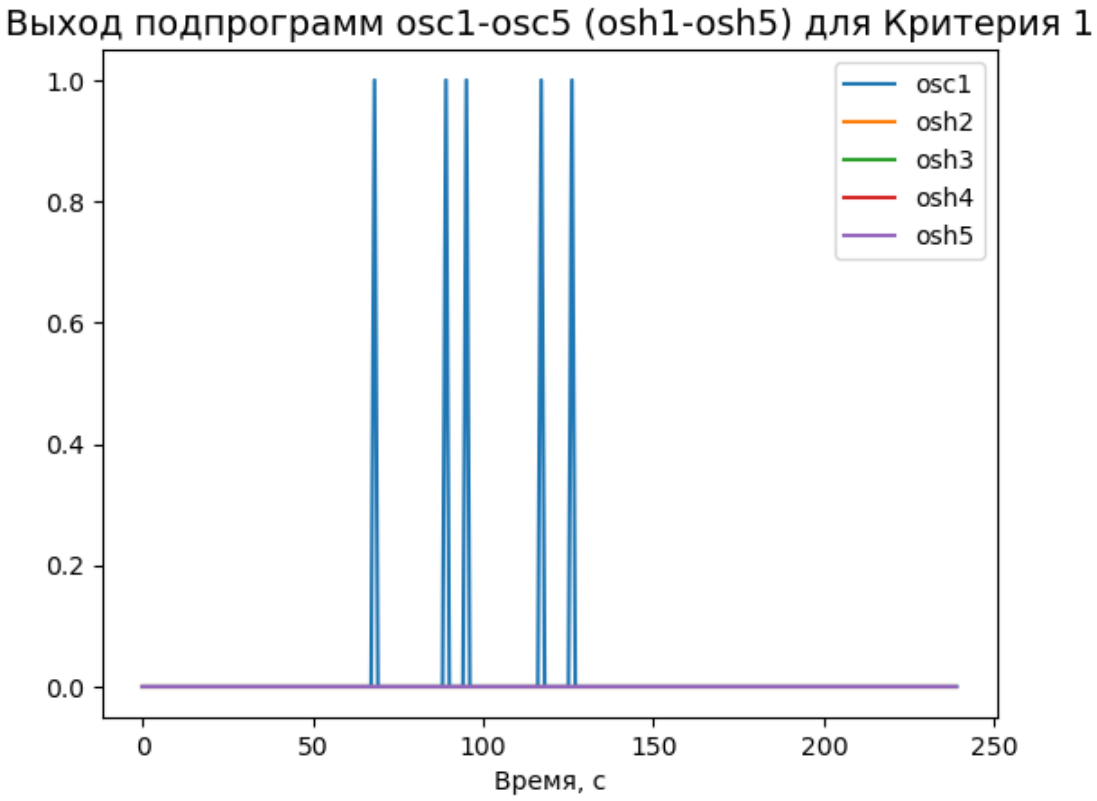
```
#                    1
plt.title('                    1    ', fontsize=14)
plt.xlabel('   ,  ')
plt.plot(diagno["bug1"], label='bug1')
plt.plot(diagno["bug2"], label='bug2')
plt.plot(diagno["bug3"], label='bug3')
plt.plot(diagno["bug4"], label='bug4')
plt.plot(diagno["bug5"], label='bug5')
plt.legend()
plt.show()
```

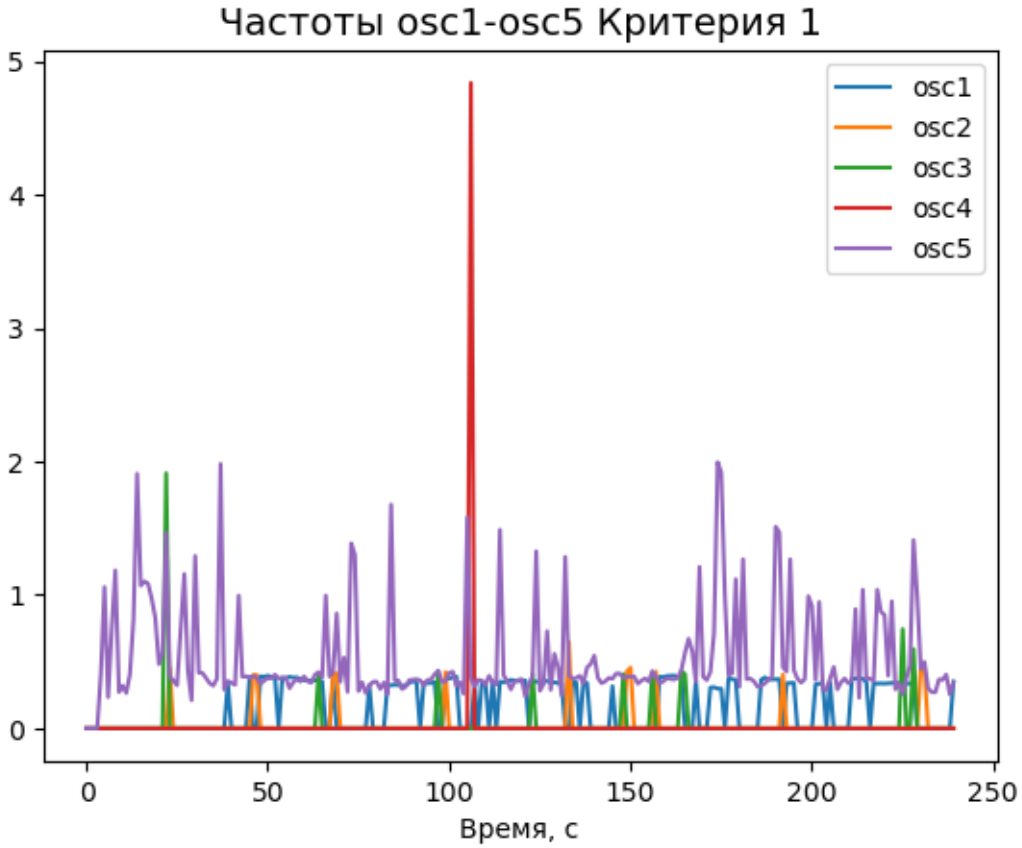


[ ]:
```
#           osc1-osc5 (osh1-osh5)      1
plt.title('          osc1-osc5 (osh1-osh5)        1', fontsize=14)
plt.xlabel('   ,  ')
plt.plot(osh["osc1"], label='osc1')
plt.plot(osh["osc2"], label='osh2')
plt.plot(osh["osc3"], label='osh3')
plt.plot(osh["osc4"], label='osh4')
plt.plot(osh["osc5"], label='osh5')
plt.legend()
plt.show()
```



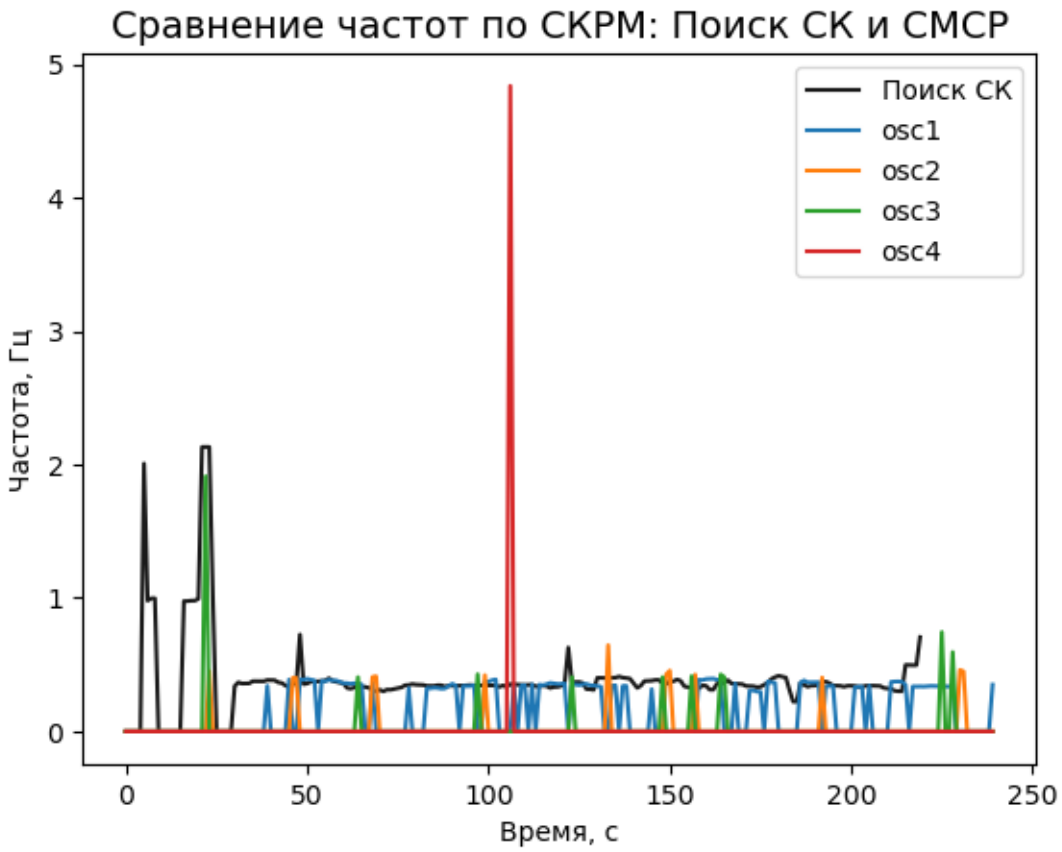

[ ]:
```
#      osc1-osc5      1
plt.title('     osc1-osc5      1', fontsize=14)
plt.xlabel('   ,  ')
plt.plot(results["osc1_f"], label='osc1')
plt.plot(results["osc2_f"], label='osc2')
plt.plot(results["osc3_f"], label='osc3')
plt.plot(results["osc4_f"], label='osc4')
```

```
plt.plot(results["osc5_f"], label='osc5')
plt.legend()
plt.show()
```




[ ]:
```
#           -     (            )
x=df_sk["time"]
y1=df_sk["G1_def_P_freq"]
y1_filled = pd.Series(y1).fillna(method='ffill')
y2=results["osc5_f"]
plt.title('              :          ', fontsize=14)
plt.xlabel('   ,  ')
plt.ylabel('    ,  ')
plt.plot(x,y1_filled,'0.1', label='     ')
plt.plot(results["osc1_f"], label='osc1')
plt.plot(results["osc2_f"], label='osc2')
plt.plot(results["osc3_f"], label='osc3')
plt.plot(results["osc4_f"], label='osc4')
plt.legend()
plt.show()
```

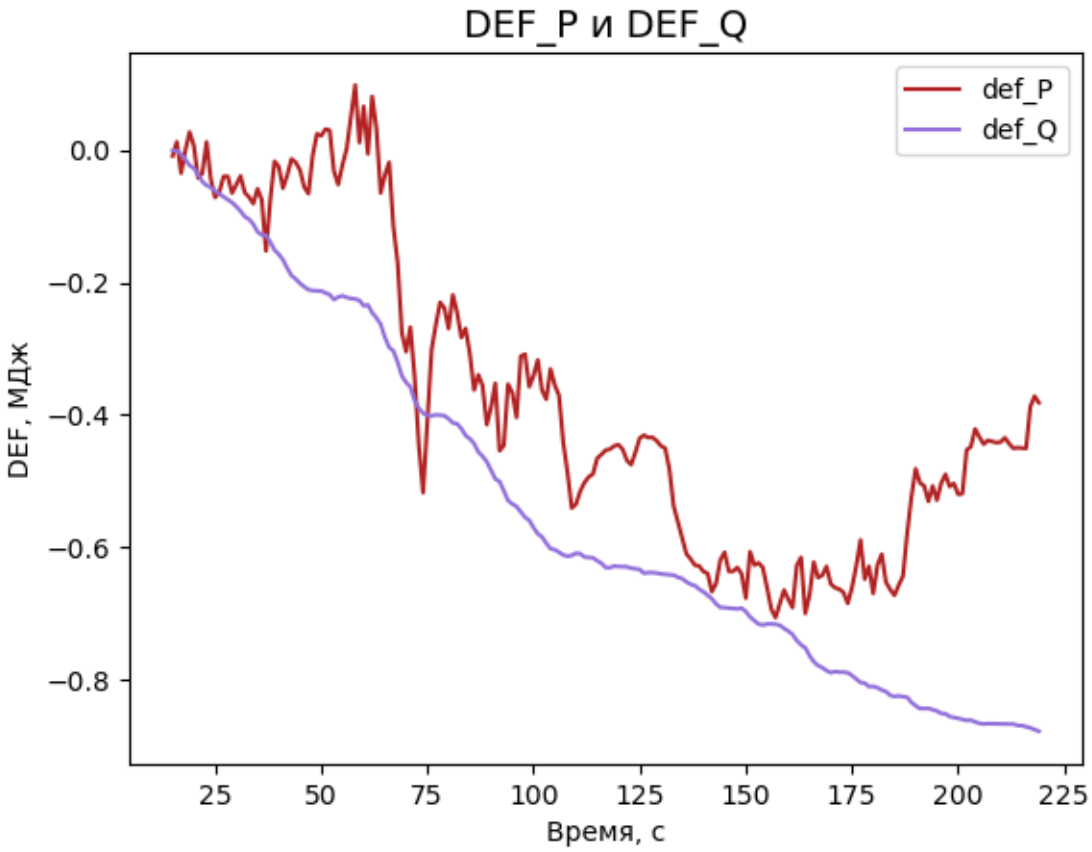
```
C:\Users\das\AppData\Local\Temp\ipykernel_15460\3900864808.py:4: FutureWarning:
Series.fillna with 'method' is deprecated and will raise in a future version.
Use obj.ffill() or obj.bfill() instead.
  y1_filled = pd.Series(y1).fillna(method='ffill')
```




[ ]:
```
#       -       (             )
x=df_sk["time"]
y1=df_sk["G1_def_Q_amp"]/1000000
y1_filled = pd.Series(y1).fillna(method='ffill')
plt.title('                :      ', fontsize=14)
plt.xlabel('   ,  ')
plt.ylabel('     ,    ')
plt.plot(x,y1_filled,'mediumpurple', label='     ')
plt.legend()
plt.show()
```

```
C:\Users\das\AppData\Local\Temp\ipykernel_15460\2729482021.py:4: FutureWarning:
Series.fillna with 'method' is deprecated and will raise in a future version.
Use obj.ffill() or obj.bfill() instead.
  y1_filled = pd.Series(y1).fillna(method='ffill')
```


[ ]:
```
# DEF_P   DEF_Q
x=df_sk["time"]
y1=df_sk["G1_def_P"]/1000000
y2=df_sk["G1_def_Q"]/1000000
plt.title('DEF_P   DEF_Q', fontsize=14)
plt.xlabel('   ,  ')
plt.ylabel('DEF,   ')
plt.plot(x,y1,'firebrick',label='def_P')
plt.plot(y2,'mediumpurple',label='def_Q')
plt.legend()
plt.show()
```

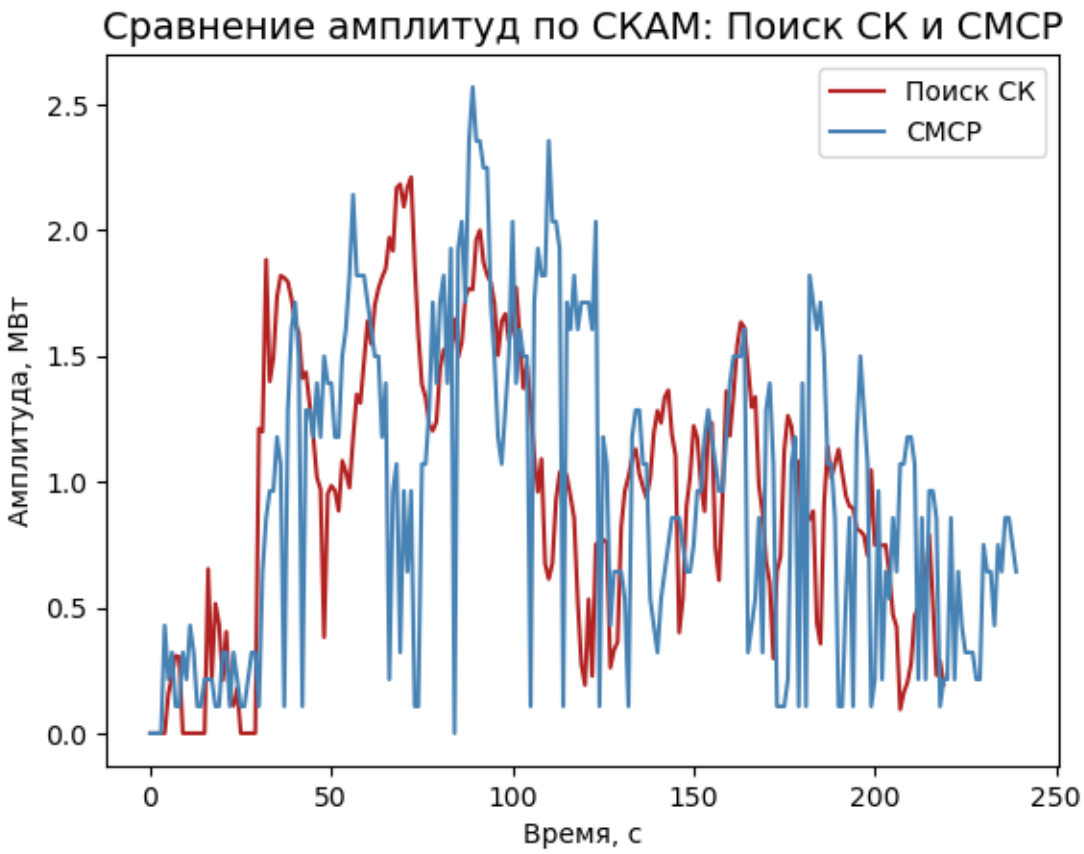



[ ]:
```
#            -      (             )
x=df_sk["time"]
y1=df_sk["G1_def_P_freq"]
y1_filled = pd.Series(y1).fillna(method='ffill')
y2=results["osc5_f"]
plt.title('                :           ', fontsize=14)
plt.xlabel('   ,  ')
plt.ylabel('    ,   ')
plt.plot(x,y1_filled,'firebrick', label='     ')
plt.plot(y2,'steelblue', label='   ')
plt.legend()
plt.show()
```

```
C:\Users\das\AppData\Local\Temp\ipykernel_15460\1811170415.py:4: FutureWarning:
Series.fillna with 'method' is deprecated and will raise in a future version.
Use obj.ffill() or obj.bfill() instead.
  y1_filled = pd.Series(y1).fillna(method='ffill')
```


[ ]:
```
#           -      (           )
x=df_sk["time"]
y1=df_sk["G1_def_P_amp"]/1000000
y1_filled = pd.Series(y1).fillna(method='ffill')
y2=results["osc5_amp"]*Pnom1
plt.title('                :          ', fontsize=14)
plt.xlabel('   ,  ')
plt.ylabel('     ,   ')
plt.plot(x,y1_filled,'firebrick', label='     ')
plt.plot(y2,'steelblue', label='   ')
plt.legend()
plt.show()
```

```
C:\Users\das\AppData\Local\Temp\ipykernel_15460\1977992034.py:4: FutureWarning:
Series.fillna with 'method' is deprecated and will raise in a future version.
Use obj.ffill() or obj.bfill() instead.
  y1_filled = pd.Series(y1).fillna(method='ffill')
```


Сравнение амплитуд по СКАМ: Поиск СК и СМСР
Поиск СК
СМСР
Амплитуда, МВт
Время, с
0.0
0.5
1.0
1.5
2.0
2.5
0
50
100
150
200
250