Example usage for moment.py

1. Specify parameters to use:

In [1]:

```
import numpy as np
import moment
```

In [2]:

```
# Specify variables:
stations_to_calculate_moment_for = ["SKR01", "SKR02", "SKR03", "SKR04", "SKR05",
"SKR06", "SKR07"]
stations_not_to_process = ["SKG08", "SKG09", "SKG10", "SKG11", "SKG12", "SKG13",
"GR01", "GR02", "GR03","GR04","BARD"]
mseed_filename = "data/mseed_data/20140629184210331.m"
inventory_fname = None
instruments_gain_filename = "data/instrument_gain_data.txt" # File with instrume
nt name, instrument gains (Z,N,E) and digitaliser gains (Z,N,E)
NLLoc_event_hyp_filename = "data/NLLoc_data/loc.Tom__RunNLLoc000.20140629.18421
0.grid0.loc.hyp"
window_before_after = [0.004, 0.196] # The time before and after the phase pick
 to use for calculating the magnitude within
filt_freqs = []
# MT_data_filename = "data/MT_data/20140629184210363MT.mat"
MT_six_tensor = np.array([1.,1.,1.,0.,0.,0.])
density = 917. # Density of medium, in kg/m3
Vp = 3630. # P-wave velocity in m/s
Q = 150. # Quality factor for the medium
verbosity_level = 1 # Verbosity level (1 for moment only) (2 for major parameter
s) (3 for plotting of traces)
```

Run moment calculation:

In [3]:

```
# Find seismic moment release:
M_0, M_0_err = moment.calc_moment(mseed_filename, NLLoc_event_hyp_filename, stat
ions_to_calculate_moment_for, density, Vp, inventory_fname=inventory_fname, inst
ruments_gain_filename=instruments_gain_filename, Q=Q, window_before_after=window
_before_after, filt_freqs=filt_freqs, stations_not_to_process=stations_not_to_pr
ocess, MT_six_tensor=MT_six_tensor, verbosity_level=verbosity_level)
print("Seismic moment release (Nm):", M_0)

# And find corresponding moment magnitude, M_w (Hanks and Kanamori 1979):
M_w = (2./3.)*np.log10(M_0) - 6.0
print("Local moment magnitude, M:", M_w)
```

```
Processing data for station: SKR01
Overall seismic moment (Nm): 18213771.45898596
Processing data for station: SKR02
Overall seismic moment (Nm): 10188781.016174326
Processing data for station: SKR03
Overall seismic moment (Nm): 6236025.461794561
Processing data for station: SKR04
Overall seismic moment (Nm): 8573795.56545731
Processing data for station: SKR05
Overall seismic moment (Nm): 6351311.5163656175
Processing data for station: SKR06
Overall seismic moment (Nm): 3736092.863904548
Processing data for station: SKR07
Overall seismic moment (Nm): 7871438.4065007055
Average seismic moment for event: 8738745.184169004 +/- 1626616.1947
75836
Seismic moment release (Nm): 8738745.184169004
Local moment magnitude, M: -1.3723672827986757

/Users/eart0504/opt/anaconda3/lib/python3.7/site-packages/obspy/sign
al/headers.py:93: FutureWarning: Passing (type, 1) or '1type' as a s
ynonym of type is deprecated; in a future version of numpy, it will
be understood as (type, (1,)) / '(1,)type'.
  ], align=True)
```