Completed: Loaded data from the near\_field\_df.pkl file

## Out[10]:

	station name	distance	event	location	magnitude	mag type	max amplitude	frequency band	max amplitude (normalized)
0	R4002	908.268837124511492	2021-06- 27T20:09:49.584000Z	[16.5489, -76.277, 10.0]	4.2000000000000000	ml	0.000000534662376	(0.1, 0.25)	-0.635310200530751
1	R50D4	338.468946591174472	2021-06- 27T20:09:49.584000Z	[16.5489, -76.277, 10.0]	4.2000000000000000	ml	0.000000581083235	(0.1, 0.25)	-0.599151479049431
2	RCE1F	379.453807821896021	2021-06- 27T20:09:49.584000Z	[16.5489, -76.277, 10.0]	4.2000000000000000	ml	0.000003295512426	(0.1, 0.25)	0.154533129014280
3	RD4D8	579.622998482174808	2021-06- 27T20:09:49.584000Z	[16.5489, -76.277, 10.0]	4.2000000000000000	ml	0.000000602280946	(0.1, 0.25)	-0.583590700291451
4	R4002	908.268837124511492	2021-06- 27T20:09:49.584000Z	[16.5489, -76.277, 10.0]	4.2000000000000000	ml	0.000000200171017	(0.25, 0.5)	-1.061988629681866
115	RD4D8	210.678227300626787	2021-01- 12T19:16:27.853000Z	[16.5221, -72.0398, 14.17]	4.4000000000000000	mb	0.000002338647498	(0.5, 0.75)	0.764985240319231
116	R50D4	251.935331799828901	2021-01- 12T19:16:27.853000Z	[16.5221, -72.0398, 14.17]	4.4000000000000000	mb	0.000001186120558	(0.75, 1.0)	0.470149307608398
117	RD4D8	210.678227300626787	2021-01- 12T19:16:27.853000Z	[16.5221, -72.0398, 14.17]	4.4000000000000000	mb	0.000003527407220	(0.75, 1.0)	0.943476073825657
118	R50D4	251.935331799828901	2021-01- 12T19:16:27.853000Z	[16.5221, -72.0398, 14.17]	4.4000000000000000	mb	0.000001879365470	(1.0, 1.25)	0.670031717430464
119	RD4D8	210.678227300626787	2021-01- 12T19:16:27.853000Z	[16.5221, -72.0398, 14.17]	4.4000000000000000	mb	0.000007065519054	(1.0, 1.25)	1.245164546157867

120 rows × 9 columns

```
In [11]: max and normalized max plots(df)
```

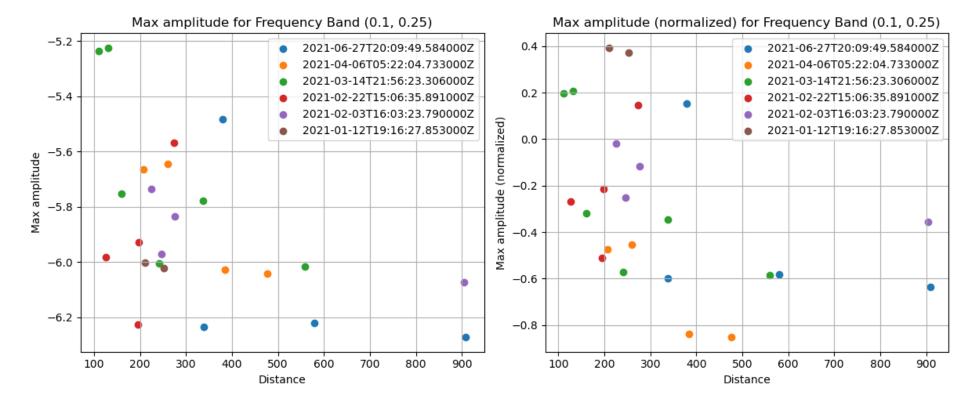
/Users/hkunwer/Documents/research/EQenergy/Wiggles/Attenuation/AttenuationFunctionsTesting.py:330: SettingWith CopyWarning:

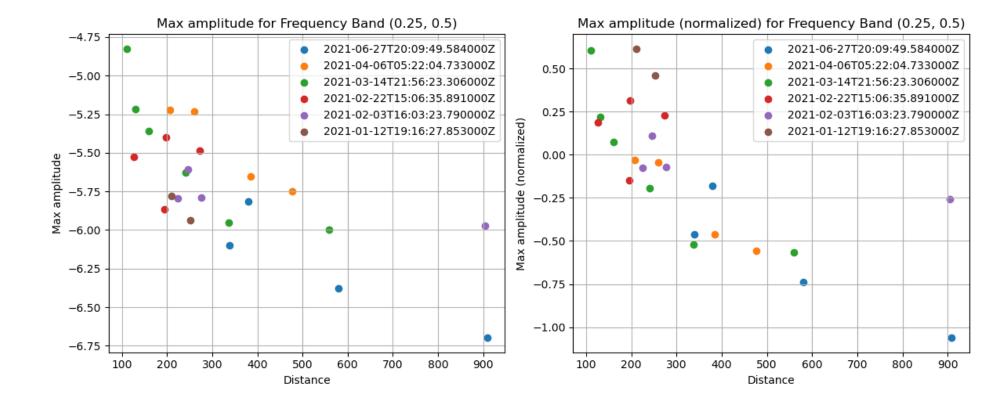
A value is trying to be set on a copy of a slice from a DataFrame.

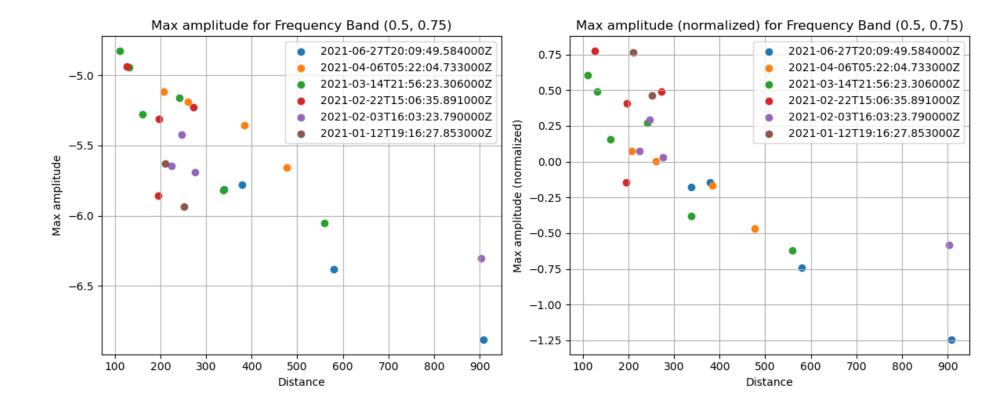
Try using .loc[row indexer,col indexer] = value instead

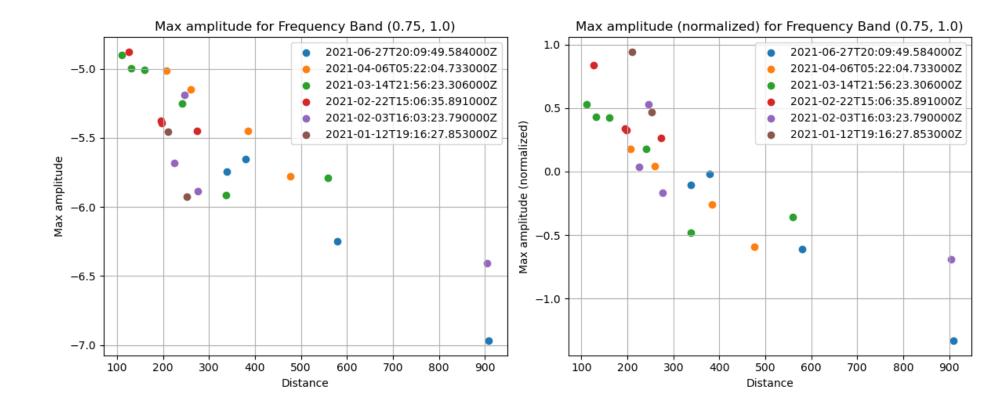
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#re turning-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy)

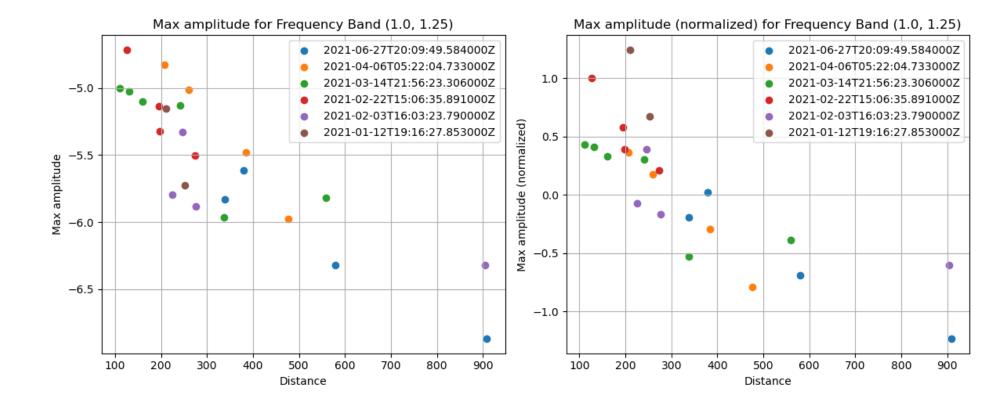
filtered\_df.loc[:, 'event'] = filtered\_df['event'].astype(str)











```
In [8]: import matplotlib.pyplot as plt
        import numpy as np
        import pandas as pd
        pd.set option('display.float format', lambda x: '%.15f' % x)
        # Convert 'event' column to string type
        df.loc[:, 'event'] = df['event'].astype(str)
        # # Get unique events (dates) from the filtered data
        unique_events = df['event'].unique()
        for target event in unique events:
            freglist = [(0.10, 0.25), (0.25, 0.50), (0.50, 0.75), (0.75, 1.00), (1.00, 1.25)]
            for freq band in freqlist:
                # Convert 'frequency band' to a tuple with the correct format
                filtered df = df[df['frequency band'] == freq band]
                # Filter for the target event in the specified frequency band
                filtered df = filtered df[filtered df['event'] == target event]
                print(filtered_df)
                if filtered df.empty:
                    continue
                fig, axs = plt.subplots(1, 2, figsize=(12, 5))
                for event in [target event]:
                    event data = filtered df[filtered df['event'] == event]
                    axs[0].scatter(
                        event data['distance'],
                        np.log10(event_data['max amplitude']),
                        label=event)
                    axs[0].set xlabel('Distance')
                    axs[0].set ylabel('Max amplitude')
                    axs[0].set title(f'Max amplitude for Frequency Band {freq band}')
                    axs[0].legend()
                    axs[0].grid(True)
                    axs[1].scatter(
```

```
event data['distance'],
               event data['max amplitude (normalized)'],
                label=event)
            axs[1].set xlabel('Distance')
            axs[1].set ylabel('Max amplitude (normalized)')
            axs[1].set title(f'Max amplitude (normalized) for Frequency Band {freq band}')
            axs[1].legend()
            axs[1].grid(True)
       plt.tight layout()
        plt.show()
# Call the function with your DataFrame
  station name
                           distance
                                                           event \
         R3CD4 1084.987082155695816 2021-06-27T20:09:49.584000Z
0
1
         R50D4 338.468946591174472 2021-06-27T20:09:49.584000Z
2
         RCE1F 379.453807821896021 2021-06-27T20:09:49.584000Z
         RD4D8 579.622998482174808 2021-06-27T20:09:49.584000Z
                   location
                                   magnitude mag type
                                                           max amplitude \
0 [16.5489, -76.277, 10.0] 4.20000000000000
                                                    ml 0.000000393948491
```

ml 0.000000581083235

ml 0.000003295512426

ml 0.000000602280946

1 [16.5489, -76.277, 10.0] 4.20000000000000

2 [16.5489, -76.277, 10.0] 4.20000000000000

3 [16.5489, -76.277, 10.0] 4.20000000000000

frequency band max amplitude (normalized)

-0.940729840237233

-0.771930936610780

-0.018246328547069

-0.756370157852800

(0.1, 0.25)

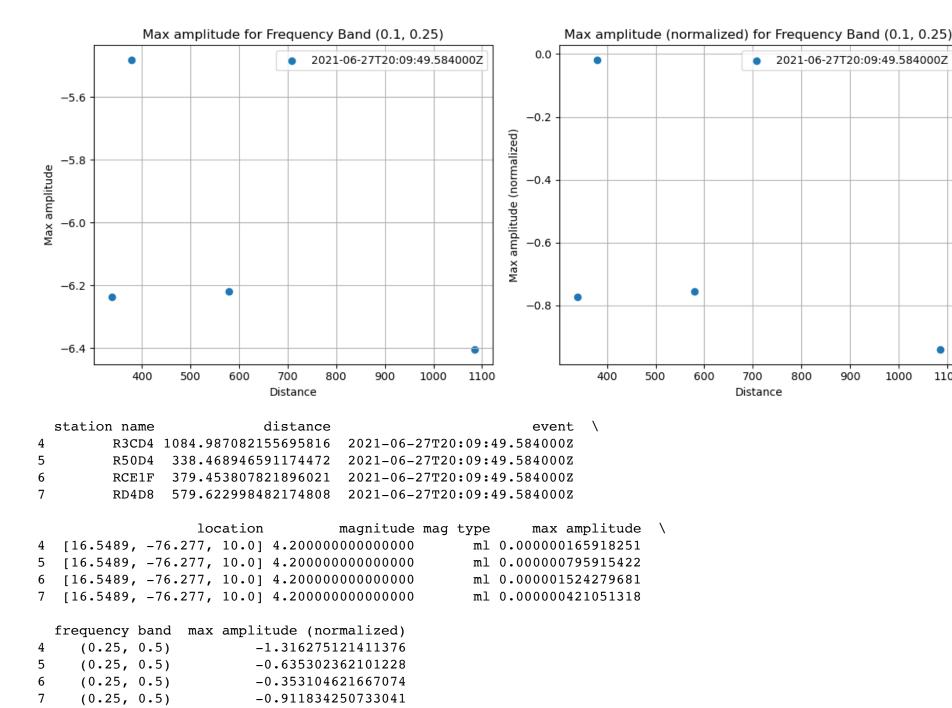
(0.1, 0.25)

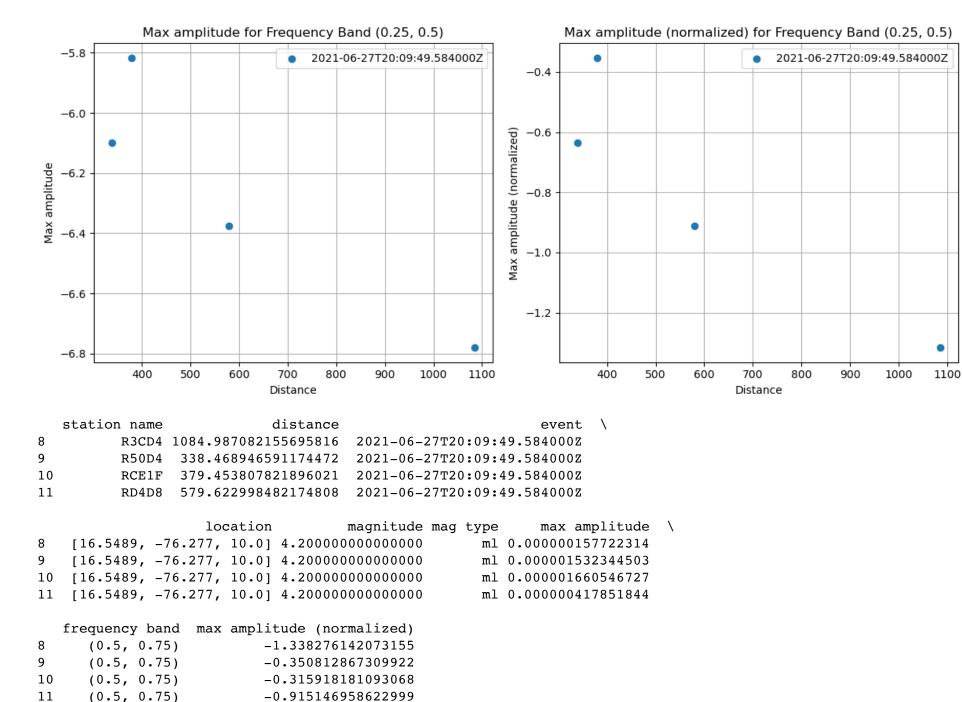
(0.1, 0.25)

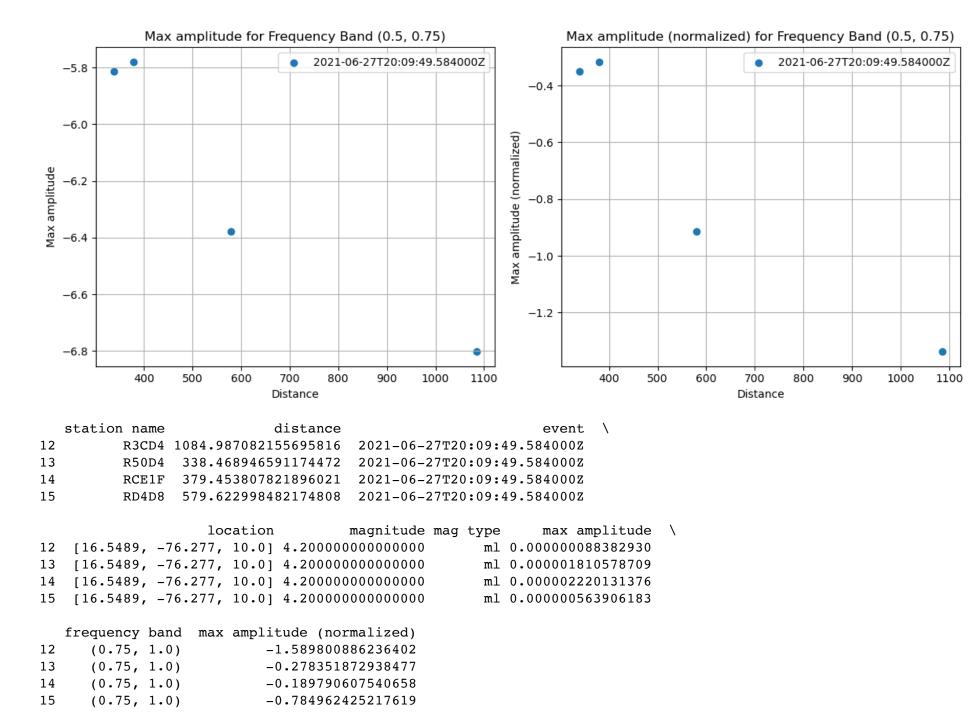
(0.1, 0.25)

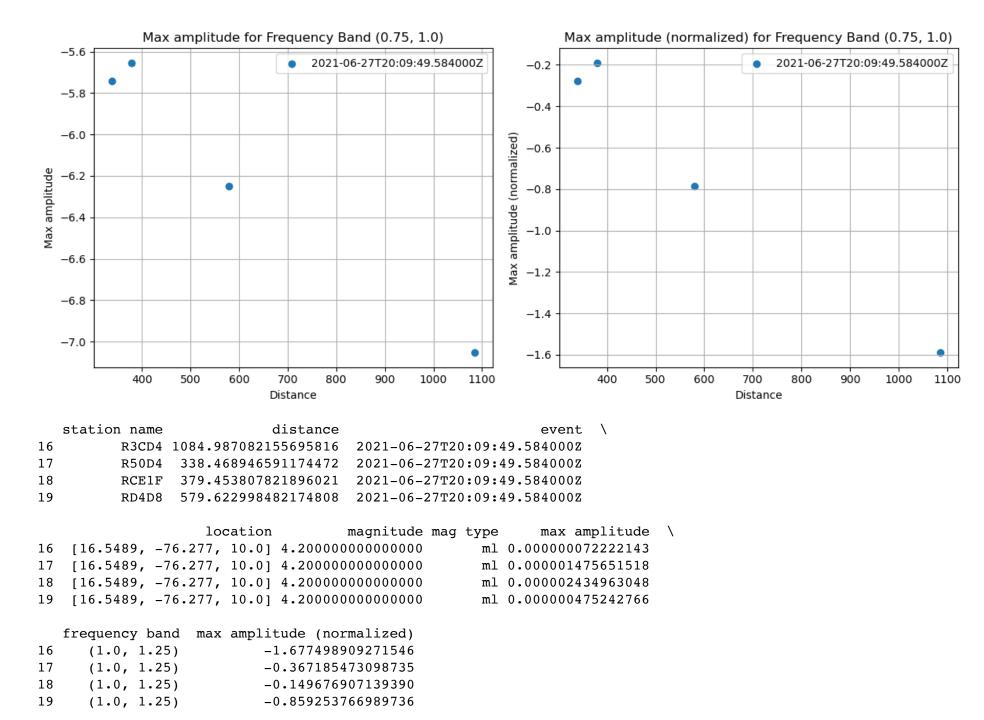
1

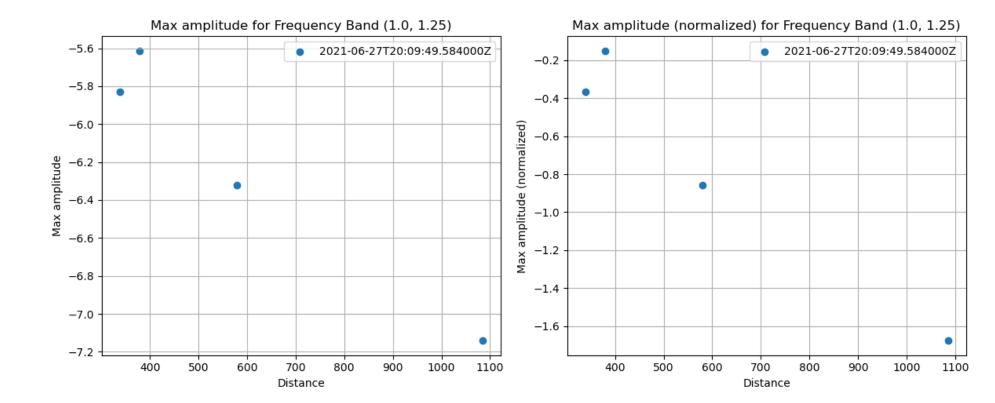
2







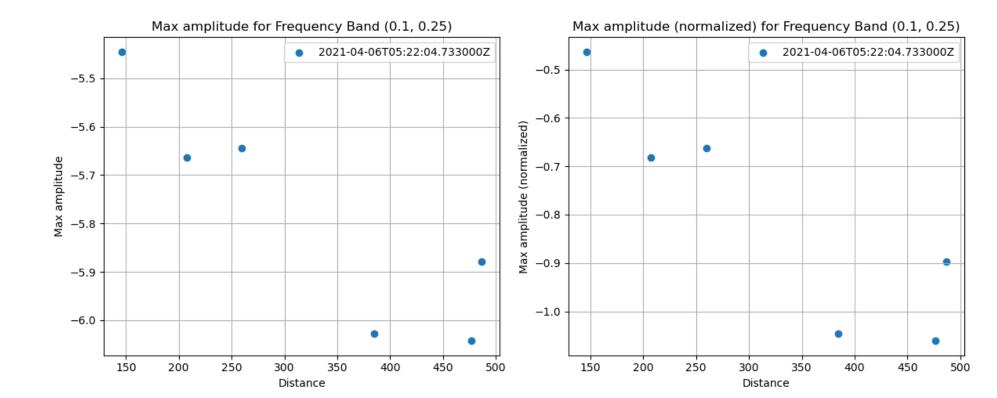




```
station name
                           distance
                                                           event \
          R1D7C 476.632096339389363
20
                                     2021-04-06T05:22:04.733000Z
21
         R4EEE 384.481997940264648
                                     2021-04-06T05:22:04.733000Z
22
         RD4D8 259.645688629670076
                                    2021-04-06T05:22:04.733000Z
23
         RE001 486.752011853869647 2021-04-06T05:22:04.733000Z
24
         REF37 146.042882404791158 2021-04-06T05:22:04.733000Z
25
         REFAF 207.432266420409036 2021-04-06T05:22:04.733000Z
                     location
                                                             max amplitude \
                                      magnitude mag type
   [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000000906703924
21 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000000939509818
22 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000002270525287
23 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000001323153614
24 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000003589071221
25 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000002166620704
   frequency band max amplitude (normalized)
     (0.1, 0.25)
                           -1.060800557425960
20
21
     (0.1, 0.25)
                           -1.045364729757249
22
     (0.1, 0.25)
                           -0.662139709719296
23
     (0.1, 0.25)
                           -0.896655785281998
     (0.1, 0.25)
24
                           -0.463283976236986
```

25

(0.1, 0.25)

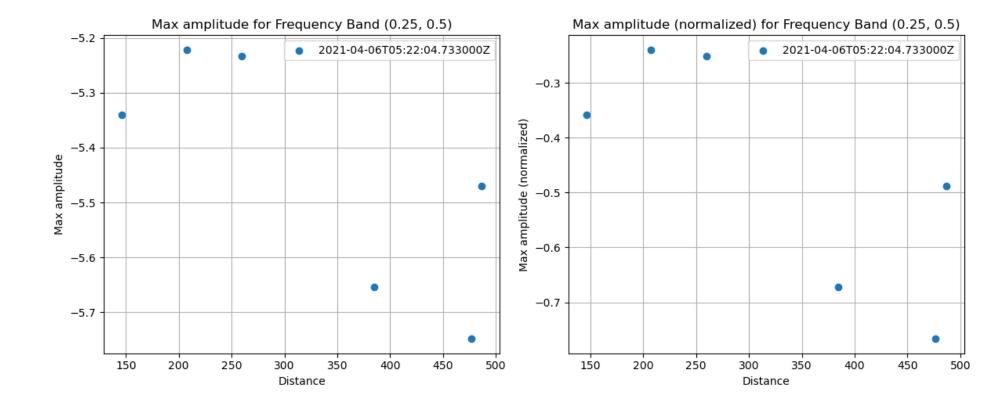


```
R1D7C 476.632096339389363
26
                                     2021-04-06T05:22:04.733000Z
27
         R4EEE 384.481997940264648
                                     2021-04-06T05:22:04.733000Z
28
         RD4D8 259.645688629670076
                                   2021-04-06T05:22:04.733000Z
         RE001 486.752011853869647 2021-04-06T05:22:04.733000Z
29
30
         REF37 146.042882404791158 2021-04-06T05:22:04.733000Z
31
         REFAF 207.432266420409036 2021-04-06T05:22:04.733000Z
                     location
                                                             max amplitude \
                                      magnitude mag type
   [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000001785529430
27 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000002221905740
28 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000005852578307
29 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000003391732606
30 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000004562696104
31 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000006003927432
   frequency band max amplitude (normalized)
     (0.25, 0.5)
                           -0.766499039836341
26
27
     (0.25, 0.5)
                           -0.671540421841121
28
     (0.25, 0.5)
                           -0.250918819466826
     (0.25, 0.5)
29
                           -0.487844446293266
     (0.25, 0.5)
30
                           -0.359044508964234
     (0.25, 0.5)
```

event \

distance

station name



```
R1D7C 476.632096339389363
32
                                    2021-04-06T05:22:04.733000Z
33
         R4EEE 384.481997940264648
                                     2021-04-06T05:22:04.733000Z
34
         RD4D8 259.645688629670076
                                   2021-04-06T05:22:04.733000Z
         RE001 486.752011853869647 2021-04-06T05:22:04.733000Z
35
36
         REF37 146.042882404791158 2021-04-06T05:22:04.733000Z
37
         REFAF 207.432266420409036 2021-04-06T05:22:04.733000Z
                     location
                                                            max amplitude \
                                     magnitude mag type
32 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000002199600881
33 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000004410413798
34 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000006507794549
35 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000005516484180
36 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000006634492967
37 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000007688178461
   frequency band max amplitude (normalized)
     (0.5, 0.75)
                           -0.675922167742025
32
33
     (0.5, 0.75)
                           -0.373786714566497
34
     (0.5, 0.75)
                           -0.204832218942882
35
     (0.5, 0.75)
                           -0.276603675660835
     (0.5, 0.75)
36
                           -0.196458314659639
```

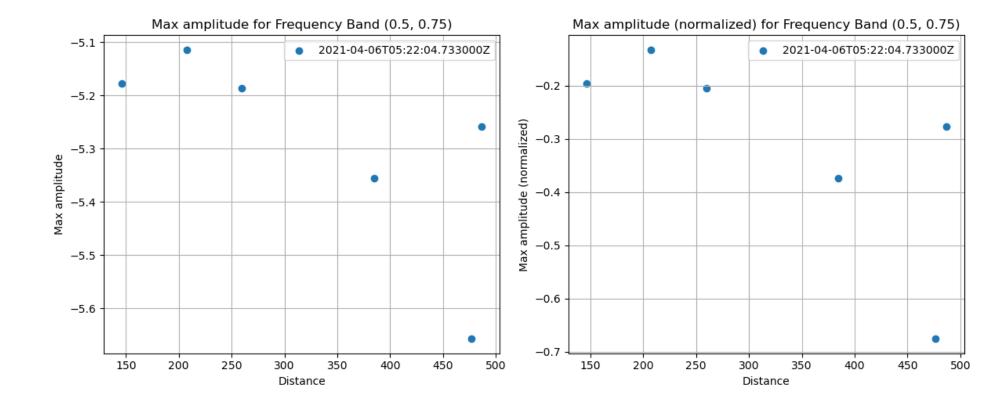
event \

distance

station name

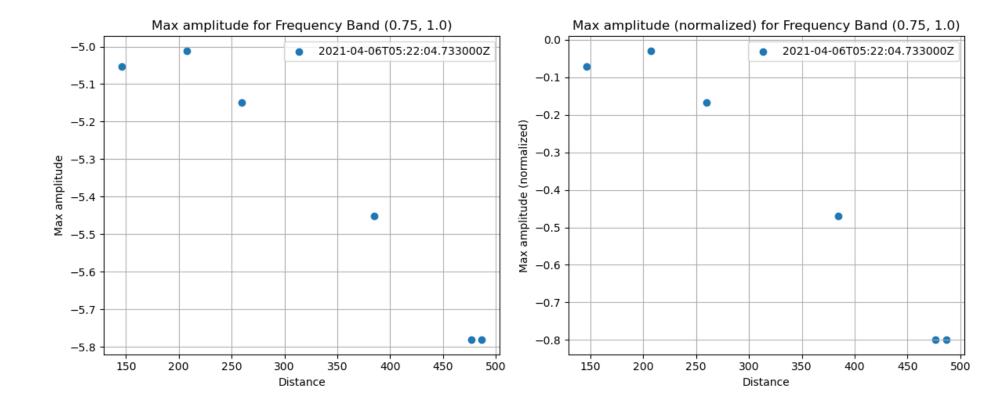
37

(0.5, 0.75)



```
station name
                           distance
                                                           event \
          R1D7C 476.632096339389363
38
                                     2021-04-06T05:22:04.733000Z
39
         R4EEE 384.481997940264648
                                     2021-04-06T05:22:04.733000Z
40
         RD4D8 259.645688629670076
                                    2021-04-06T05:22:04.733000Z
         RE001 486.752011853869647 2021-04-06T05:22:04.733000Z
41
42
         REF37 146.042882404791158
                                    2021-04-06T05:22:04.733000Z
43
         REFAF 207.432266420409036 2021-04-06T05:22:04.733000Z
                     location
                                                             max amplitude \
                                      magnitude mag type
   [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000001659023845
39 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000003535802947
40 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000007090457288
41 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000001654232240
42 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000008842147467
43 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000009749020497
   frequency band max amplitude (normalized)
     (0.75, 1.0)
                           -0.798413424471421
38
39
     (0.75, 1.0)
                           -0.469777999329800
     (0.75, 1.0)
40
                           -0.167591807503889
     (0.75, 1.0)
41
                           -0.799669572116048
     (0.75, 1.0)
42
                           -0.071708299049010
```

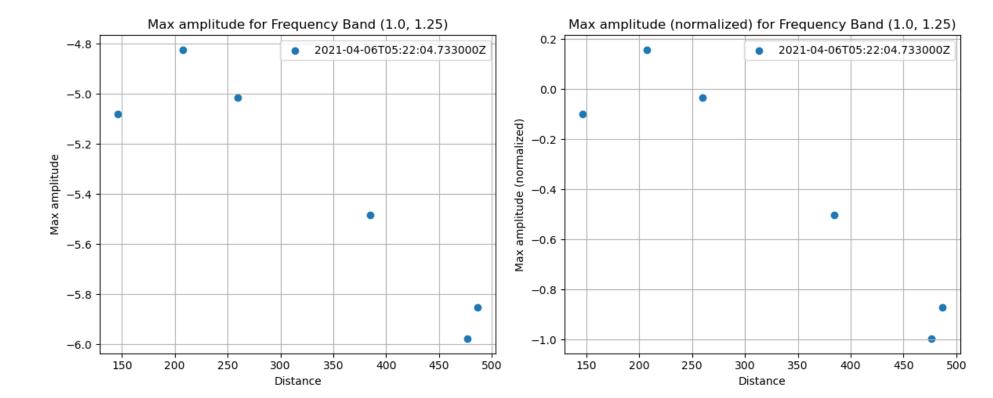
(0.75, 1.0)



```
station name
                           distance
                                                           event \
          R1D7C 476.632096339389363
44
                                     2021-04-06T05:22:04.733000Z
45
         R4EEE 384.481997940264648
                                     2021-04-06T05:22:04.733000Z
46
         RD4D8 259.645688629670076
                                    2021-04-06T05:22:04.733000Z
         RE001 486.752011853869647 2021-04-06T05:22:04.733000Z
47
48
         REF37 146.042882404791158
                                    2021-04-06T05:22:04.733000Z
49
         REFAF 207.432266420409036 2021-04-06T05:22:04.733000Z
                     location
                                                             max amplitude \
                                      magnitude mag type
44 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000001052163090
45 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000003290093259
46 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000009643819974
47 [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000001404614867
   [18.4369, -73.5434, 10.0] 4.200000000000000
                                                     mwr 0.000008327380523
49 [18.4369, -73.5434, 10.0] 4.20000000000000
                                                     mwr 0.000015012895647
   frequency band max amplitude (normalized)
44
     (1.0, 1.25)
                           -0.996182990041251
45
      (1.0, 1.25)
                           -0.501057844421292
46
     (1.0, 1.25)
                           -0.034016958139385
47
     (1.0, 1.25)
                           -0.870708792007757
     (1.0, 1.25)
48
                           -0.097757642352926
```

0.158198413147027

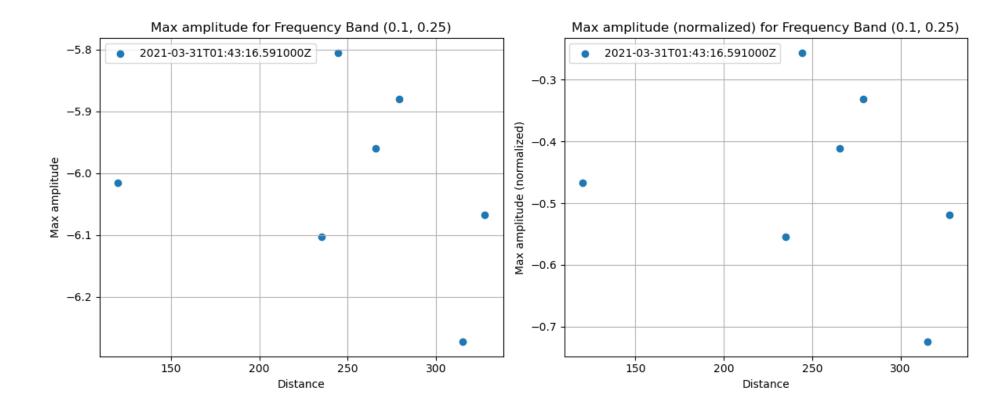
(1.0, 1.25)



```
station name
                           distance
                                                           event \
50
          R2974 235.037978134149853 2021-03-31T01:43:16.591000Z
51
         R2BF8 315.247296391148495 2021-03-31T01:43:16.591000Z
52
         R4DB9 265.699656405245946 2021-03-31T01:43:16.591000Z
53
         R4EEE 120.069760031071681 2021-03-31T01:43:16.591000Z
54
         RD17E 244.500968312444257 2021-03-31T01:43:16.591000Z
55
         REFAF 279.036614782990512 2021-03-31T01:43:16.591000Z
56
          S4051 327.518124379792880 2021-03-31T01:43:16.591000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
50 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000788318496
51 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000533478853
52 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001095937045
53 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000965206830
54 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001567265658
55 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001320566426
56 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000855414317
   frequency band max amplitude (normalized)
50
      (0.1, 0.25)
                           -0.554896402560845
51
      (0.1, 0.25)
                           -0.724480909864163
     (0.1, 0.25)
52
                           -0.411812511550092
     (0.1, 0.25)
53
                           -0.466977732396860
     (0.1, 0.25)
54
                           -0.256455501507457
55
     (0.1, 0.25)
                           -0.330837867247608
```

56

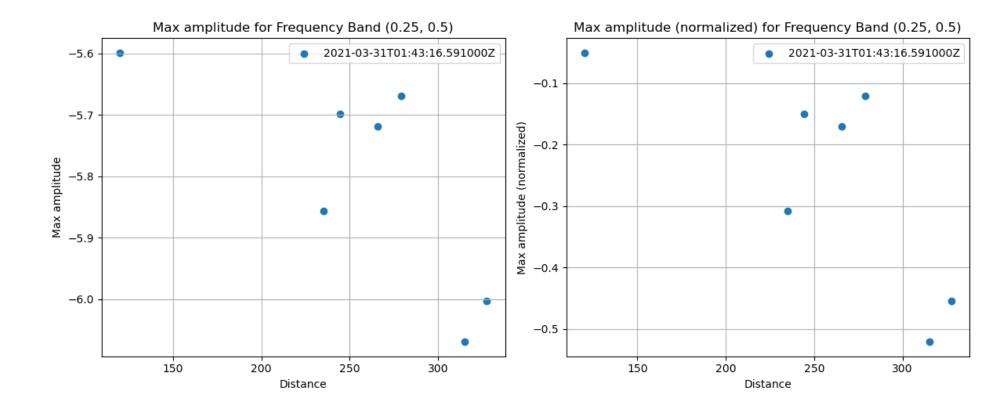
(0.1, 0.25)



```
station name
                           distance
                                                           event \
57
          R2974 235.037978134149853 2021-03-31T01:43:16.591000Z
58
         R2BF8 315.247296391148495 2021-03-31T01:43:16.591000Z
59
         R4DB9 265.699656405245946 2021-03-31T01:43:16.591000Z
60
         R4EEE 120.069760031071681 2021-03-31T01:43:16.591000Z
61
         RD17E 244.500968312444257 2021-03-31T01:43:16.591000Z
62
         REFAF 279.036614782990512 2021-03-31T01:43:16.591000Z
63
          S4051 327.518124379792880 2021-03-31T01:43:16.591000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
57 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001392415633
58 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000852764357
59 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001911512605
60 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000002518043260
61 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000002002665709
62 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000002141240504
63 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000995334356
   frequency band max amplitude (normalized)
                           -0.307829228489035
57
      (0.25, 0.5)
58
      (0.25, 0.5)
                           -0.520769079068742
     (0.25, 0.5)
59
                           -0.170220952828689
60
     (0.25, 0.5)
                           -0.050534931986834
     (0.25, 0.5)
61
                           -0.149989657464918
62
     (0.25, 0.5)
                           -0.120932668995366
```

63

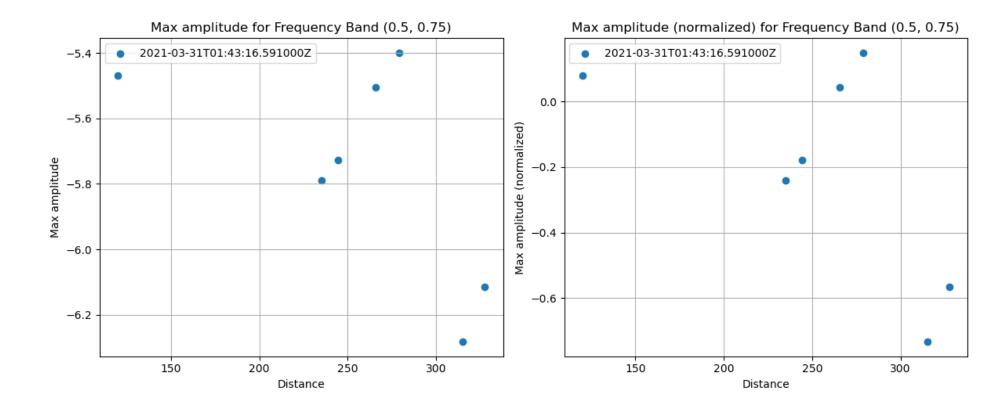
(0.25, 0.5)



```
station name
                           distance
                                                           event \
64
          R2974 235.037978134149853 2021-03-31T01:43:16.591000Z
65
         R2BF8 315.247296391148495 2021-03-31T01:43:16.591000Z
66
         R4DB9 265.699656405245946 2021-03-31T01:43:16.591000Z
67
         R4EEE 120.069760031071681 2021-03-31T01:43:16.591000Z
68
         RD17E 244.500968312444257 2021-03-31T01:43:16.591000Z
69
         REFAF 279.036614782990512 2021-03-31T01:43:16.591000Z
70
          S4051 327.518124379792880 2021-03-31T01:43:16.591000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
64 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001620183518
65 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                     mb 0.000000521910677
66 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                     mb 0.000003133770965
67 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000003395224558
68 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                     mb 0.000001869011375
69 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                     mb 0.000003987914700
70 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                     mb 0.000000767280436
   frequency band max amplitude (normalized)
      (0.5, 0.75)
                           -0.242033909079309
64
65
      (0.5, 0.75)
                           -0.734001937479628
     (0.5, 0.75)
66
                            0.044469133418018
67
     (0.5, 0.75)
                            0.079270384496847
     (0.5, 0.75)
68
                           -0.179986174495138
69
     (0.5, 0.75)
                           0.149147741369710
```

70

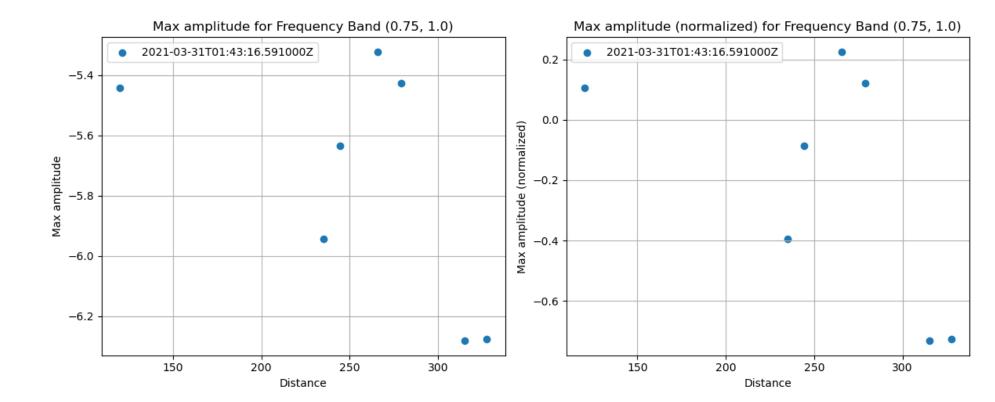
(0.5, 0.75)



```
station name
                           distance
                                                           event \
71
          R2974 235.037978134149853 2021-03-31T01:43:16.591000Z
72
         R2BF8 315.247296391148495
                                    2021-03-31T01:43:16.591000Z
73
         R4DB9 265.699656405245946 2021-03-31T01:43:16.591000Z
74
         R4EEE 120.069760031071681 2021-03-31T01:43:16.591000Z
75
         RD17E 244.500968312444257 2021-03-31T01:43:16.591000Z
76
         REFAF 279.036614782990512 2021-03-31T01:43:16.591000Z
77
          S4051 327.518124379792880 2021-03-31T01:43:16.591000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
71 [19.1729, -69.0456, 7.95] 4.100000000000000
                                                      mb 0.000001136716157
72 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000523471974
73 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000004758511291
74 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000003614577447
75 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000002322522939
76 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000003741288604
77 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000531997801
   frequency band max amplitude (normalized)
71
                           -0.395946085967577
      (0.75, 1.0)
     (0.75, 1.0)
72
                           -0.732704683923029
     (0.75, 1.0)
73
                            0.225872985137027
     (0.75, 1.0)
74
                            0.106459415522317
75
     (0.75, 1.0)
                           -0.085638106819445
76
     (0.75, 1.0)
                           0.121423092107108
```

77

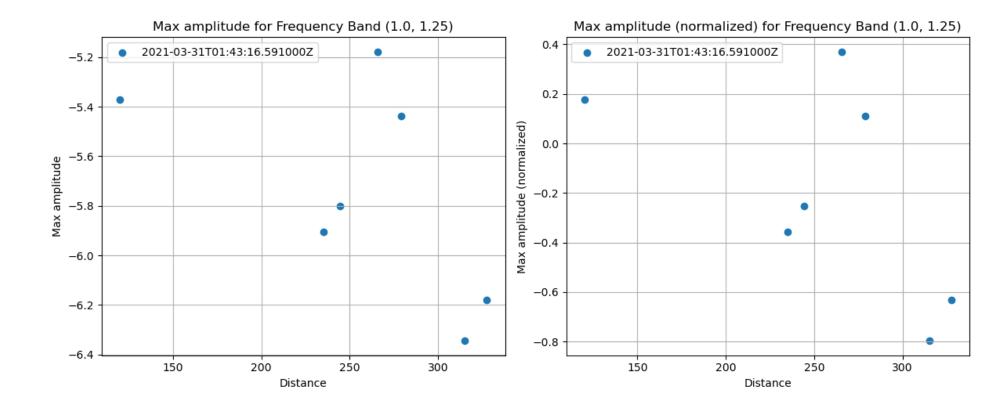
(0.75, 1.0)



```
station name
                           distance
                                                           event \
78
          R2974 235.037978134149853 2021-03-31T01:43:16.591000Z
79
         R2BF8 315.247296391148495
                                    2021-03-31T01:43:16.591000Z
80
         R4DB9 265.699656405245946 2021-03-31T01:43:16.591000Z
81
          R4EEE 120.069760031071681 2021-03-31T01:43:16.591000Z
82
         RD17E 244.500968312444257 2021-03-31T01:43:16.591000Z
83
         REFAF 279.036614782990512 2021-03-31T01:43:16.591000Z
84
          S4051 327.518124379792880 2021-03-31T01:43:16.591000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
78 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001247073662
79 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000451813650
80 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000006635004967
81 [19.1729, -69.0456, 7.95] 4.100000000000000
                                                      mb 0.000004241976391
82 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000001586169344
83 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000003646288772
84 [19.1729, -69.0456, 7.95] 4.10000000000000
                                                      mb 0.000000660181132
   frequency band max amplitude (normalized)
      (1.0, 1.25)
                           -0.355706012035452
78
79
      (1.0, 1.25)
                           -0.796638771518008
80
     (1.0, 1.25)
                            0.370243133299094
81
     (1.0, 1.25)
                            0.175970128086629
82
     (1.0, 1.25)
                           -0.251248566984522
83
     (1.0, 1.25)
                           0.110252941188410
```

84

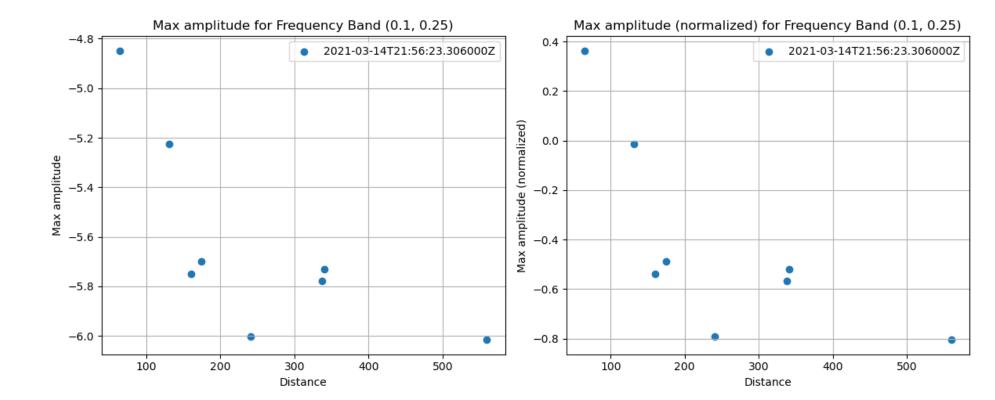
(1.0, 1.25)



```
station name
                           distance
                                                            event \
85
          R1D7C 337.263946456217639
                                     2021-03-14T21:56:23.306000Z
86
          R4DB9 559.408477510914281
                                     2021-03-14T21:56:23.306000Z
87
          R4EEE 240.700722346566863
                                     2021-03-14T21:56:23.306000Z
88
          R50D4 160.492559947893398
                                     2021-03-14T21:56:23.306000Z
89
          RAA21 64.731939373601293
                                     2021-03-14T21:56:23.306000Z
90
          RE001 340.475694429640157
                                     2021-03-14T21:56:23.306000Z
91
         REF37 174.813711375686097 2021-03-14T21:56:23.306000Z
92
          REFAF 131.050399035502522 2021-03-14T21:56:23.306000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
85 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                      mb 0.000001669197395
86 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                      mb 0.000000963298009
   [17.9685, -72.1205, 10.0] 4.300000000000000
                                                      mb 0.000000990968750
88 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                      mb 0.000001773449402
   [17.9685, -72.1205, 10.0] 4.300000000000000
                                                      mb 0.000014174135391
   [17.9685, -72.1205, 10.0] 4.300000000000000
                                                      mb 0.000001861898729
   [17.9685, -72.1205, 10.0] 4.300000000000000
                                                      mb 0.000002003580631
92 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                      mb 0.000005959551799
   frequency band
                   max amplitude (normalized)
85
      (0.1, 0.25)
                           -0.566250305628420
      (0.1, 0.25)
86
                           -0.804997341193190
      (0.1, 0.25)
87
                           -0.792698044705353
88
      (0.1, 0.25)
                           -0.539939201710290
89
      (0.1, 0.25)
                            0.362738572903186
90
     (0.1, 0.25)
                           -0.518801948518623
91
      (0.1, 0.25)
                           -0.486951179182095
```

92

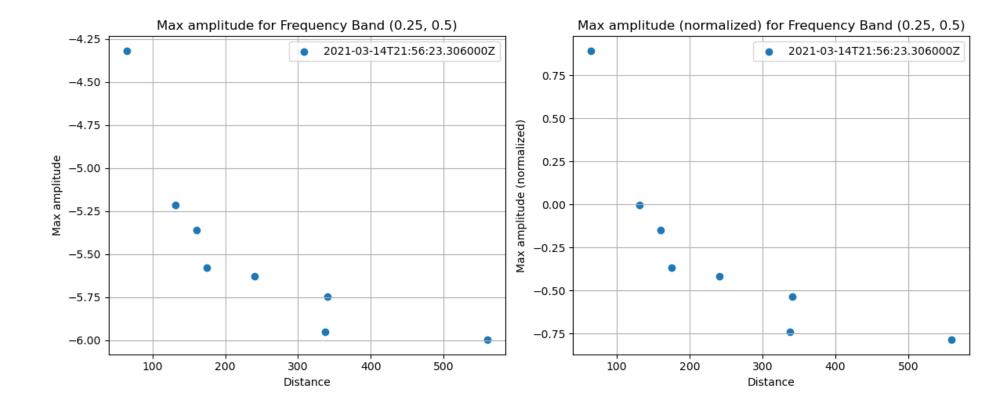
(0.1, 0.25)



```
station name
                            distance
                                                             event
93
           R1D7C 337.263946456217639
                                      2021-03-14T21:56:23.306000Z
94
           R4DB9 559.408477510914281
                                      2021-03-14T21:56:23.306000Z
95
           R4EEE 240.700722346566863
                                      2021-03-14T21:56:23.306000Z
96
           R50D4 160.492559947893398
                                      2021-03-14T21:56:23.306000Z
97
           RAA21 64.731939373601293
                                      2021-03-14T21:56:23.306000Z
98
           RE001 340.475694429640157
                                      2021-03-14T21:56:23.306000Z
99
           REF37 174.813711375686097
                                     2021-03-14T21:56:23.306000Z
100
           REFAF 131.050399035502522 2021-03-14T21:56:23.306000Z
                      location
                                       magnitude mag type
                                                               max amplitude \
93
     [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000001119924665
     [17.9685, -72.1205, 10.0] 4.300000000000000
94
                                                        mb 0.000001006558836
     [17.9685, -72.1205, 10.0] 4.300000000000000
95
                                                        mb 0.000002360175253
     [17.9685, -72.1205, 10.0] 4.300000000000000
96
                                                        mb 0.000004364007169
97
     [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000048141730983
     [17.9685, -72.1205, 10.0] 4.300000000000000
98
                                                        mb 0.000001788603801
99
     [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000002641091849
     [17.9685, -72.1205, 10.0] 4.300000000000000
100
                                                        mb 0.000006093222050
    frequency band max amplitude (normalized)
93
       (0.25, 0.5)
                            -0.739569194480532
94
       (0.25, 0.5)
                            -0.785918838152607
       (0.25, 0.5)
95
                            -0.415813751486795
96
       (0.25, 0.5)
                            -0.148872548584642
97
       (0.25, 0.5)
                             0.893763697792492
98
       (0.25, 0.5)
                            -0.536243854468006
99
       (0.25, 0.5)
                            -0.366974499015517
```

100

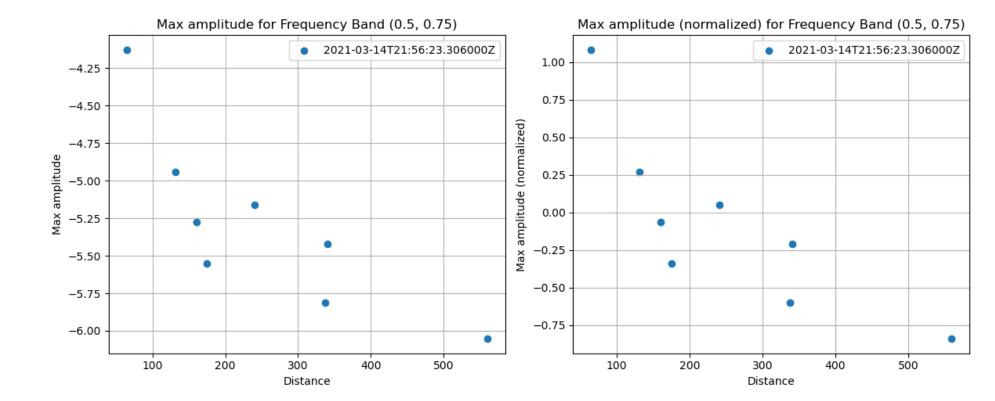
(0.25, 0.5)



```
station name
                            distance
                                                             event
                                      2021-03-14T21:56:23.306000Z
101
           R1D7C 337.263946456217639
102
           R4DB9 559.408477510914281
                                      2021-03-14T21:56:23.306000Z
103
           R4EEE 240.700722346566863
                                      2021-03-14T21:56:23.306000Z
104
           R50D4 160.492559947893398
                                      2021-03-14T21:56:23.306000Z
105
           RAA21 64.731939373601293
                                      2021-03-14T21:56:23.306000Z
106
           RE001 340.475694429640157
                                      2021-03-14T21:56:23.306000Z
107
           REF37 174.813711375686097
                                      2021-03-14T21:56:23.306000Z
108
           REFAF 131.050399035502522 2021-03-14T21:56:23.306000Z
                      location
                                       magnitude mag type
                                                               max amplitude \
101 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000001531119788
102 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000000884068949
103 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                       mb 0.000006925609287
104 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                       mb 0.000005298904946
105
   [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000074503914655
    [17.9685, -72.1205, 10.0] 4.300000000000000
106
                                                        mb 0.000003799797242
    [17.9685, -72.1205, 10.0] 4.300000000000000
107
                                                        mb 0.000002819794121
    [17.9685, -72.1205, 10.0] 4.300000000000000
108
                                                       mb 0.000011393290315
    frequency band max amplitude (normalized)
101
       (0.5, 0.75)
                            -0.603748834705347
       (0.5, 0.75)
102
                            -0.842271866798791
103
       (0.5, 0.75)
                             0.051699982950265
                            -0.064571874877538
104
       (0.5, 0.75)
105
       (0.5, 0.75)
                             1.083421088550666
106
       (0.5, 0.75)
                            -0.208997580749513
       (0.5, 0.75)
107
                            -0.338540603095209
```

0.267891159959229

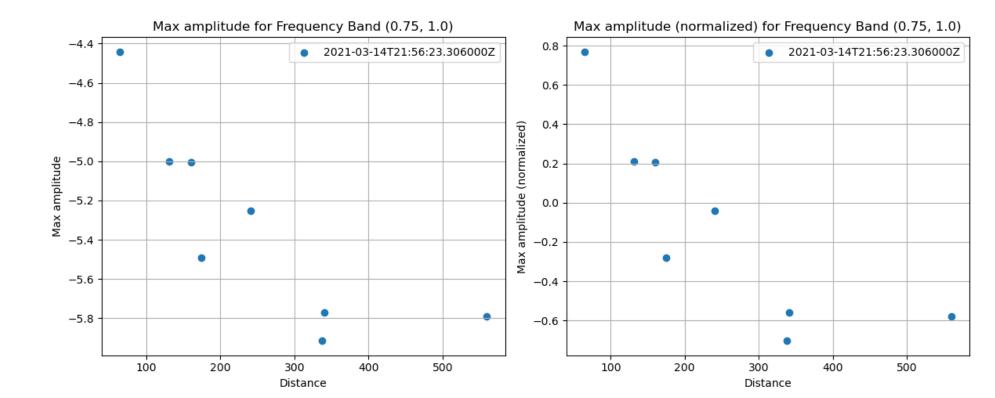
(0.5, 0.75)



```
station name
                            distance
                                                             event
                                      2021-03-14T21:56:23.306000Z
109
           R1D7C 337.263946456217639
110
           R4DB9 559.408477510914281
                                      2021-03-14T21:56:23.306000Z
111
           R4EEE 240.700722346566863
                                      2021-03-14T21:56:23.306000Z
112
           R50D4 160.492559947893398
                                      2021-03-14T21:56:23.306000Z
113
           RAA21 64.731939373601293
                                      2021-03-14T21:56:23.306000Z
114
           RE001 340.475694429640157
                                      2021-03-14T21:56:23.306000Z
115
           REF37 174.813711375686097
                                      2021-03-14T21:56:23.306000Z
116
           REFAF 131.050399035502522 2021-03-14T21:56:23.306000Z
                      location
                                       magnitude mag type
                                                               max amplitude
109
    [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000001215580227
110 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000001623766635
111 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                        mb 0.000005601022411
112 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000009862974707
113 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000036176140572
                                                        mb 0.000001690542978
114 [17.9685, -72.1205, 10.0] 4.300000000000000
    [17.9685, -72.1205, 10.0] 4.300000000000000
115
                                                        mb 0.000003217093860
116 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000010021440311
    frequency band
                    max amplitude (normalized)
109
       (0.75, 1.0)
                            -0.703974376756825
110
       (0.75, 1.0)
                            -0.578234390509421
111
       (0.75, 1.0)
                            -0.040490693546121
112
       (0.75, 1.0)
                             0.205249915499904
113
       (0.75, 1.0)
                             0.769664228660892
114
       (0.75, 1.0)
                            -0.560731787817509
115
       (0.75, 1.0)
                            -0.281294272145158
```

0.212172140194485

(0.75, 1.0)

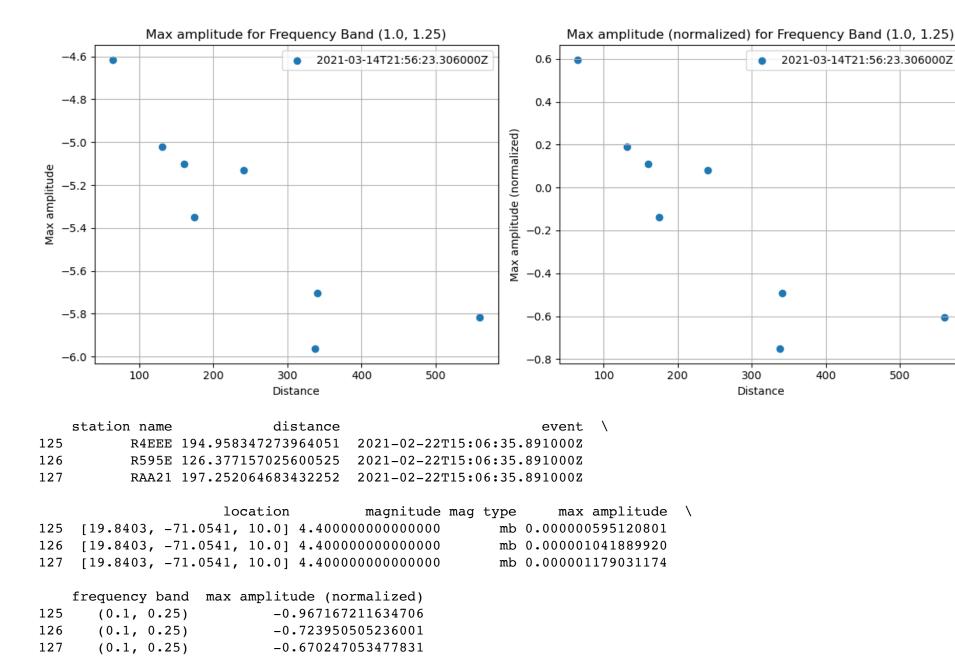


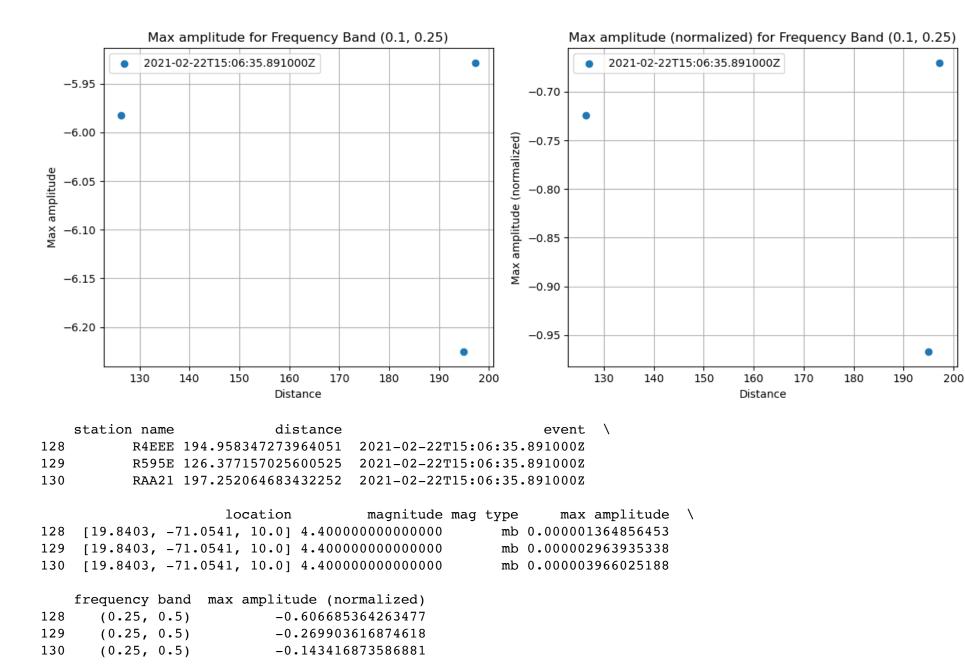
```
station name
                            distance
                                                             event
                                      2021-03-14T21:56:23.306000Z
117
           R1D7C 337.263946456217639
118
           R4DB9 559.408477510914281
                                      2021-03-14T21:56:23.306000Z
119
           R4EEE 240.700722346566863
                                      2021-03-14T21:56:23.306000Z
120
           R50D4 160.492559947893398
                                      2021-03-14T21:56:23.306000Z
121
           RAA21 64.731939373601293
                                      2021-03-14T21:56:23.306000Z
122
           RE001 340.475694429640157
                                      2021-03-14T21:56:23.306000Z
123
           REF37 174.813711375686097
                                      2021-03-14T21:56:23.306000Z
124
           REFAF 131.050399035502522 2021-03-14T21:56:23.306000Z
                      location
                                       magnitude mag type
                                                              max amplitude \
117
    [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000001088117001
118 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000001523199027
    [17.9685, -72.1205, 10.0] 4.300000000000000
119
                                                       mb 0.000007397405596
120 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                       mb 0.000007919780332
121 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000024260420123
122 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                        mb 0.000001979554558
123 [17.9685, -72.1205, 10.0] 4.30000000000000
                                                        mb 0.000004486394868
124 [17.9685, -72.1205, 10.0] 4.300000000000000
                                                       mb 0.000009504715834
    frequency band max amplitude (normalized)
       (1.0, 1.25)
117
                            -0.752082408011646
       (1.0, 1.25)
118
                            -0.606001350177762
119
       (1.0, 1.25)
                             0.080321427578663
                             0.109955131986232
120
       (1.0, 1.25)
121
       (1.0, 1.25)
                             0.596140313464804
122
       (1.0, 1.25)
                            -0.492190528194359
123
       (1.0, 1.25)
                            -0.136860508757151
```

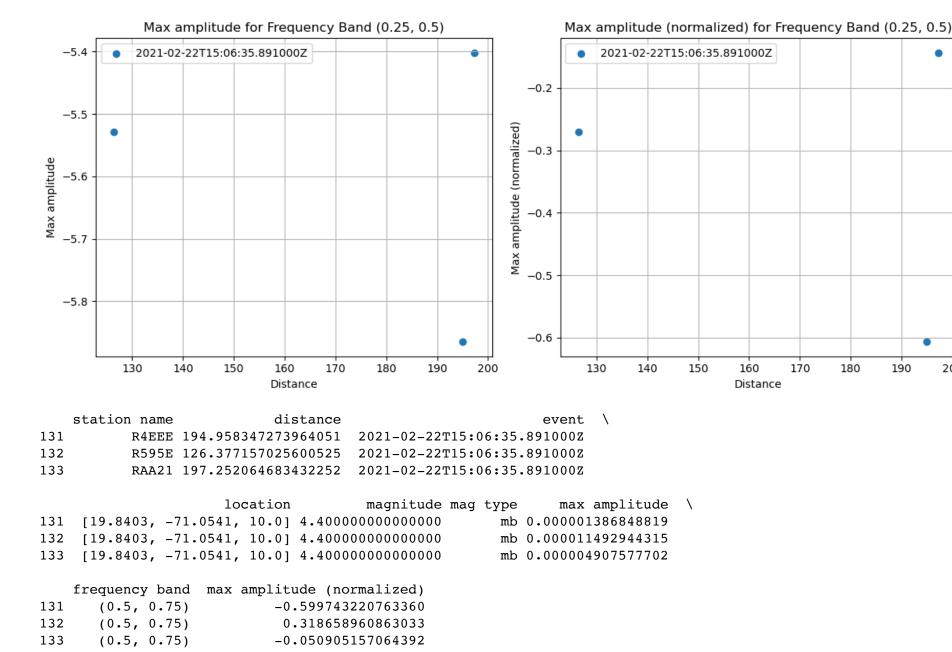
0.189181133214984

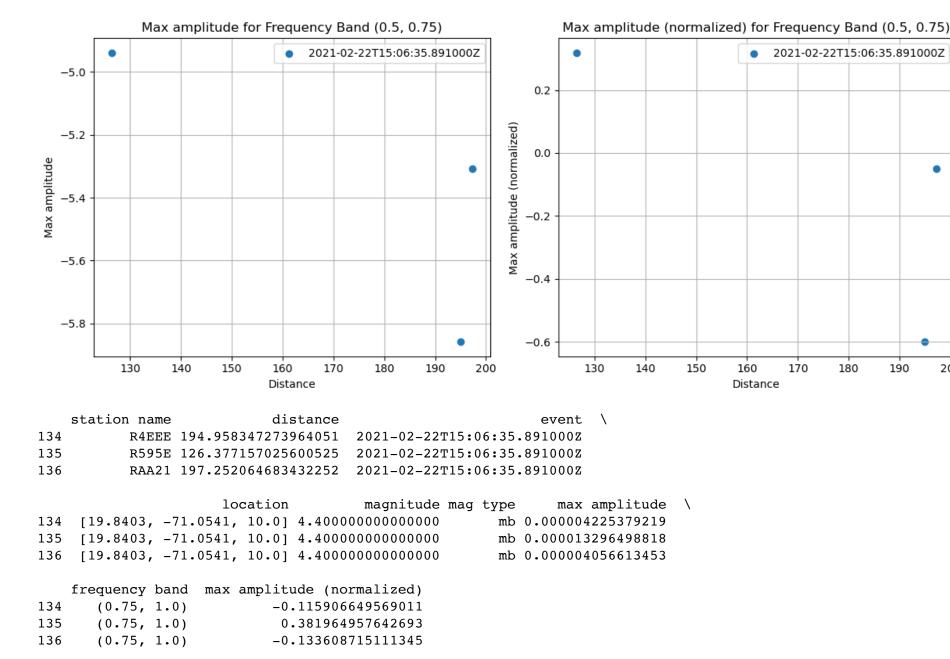
124

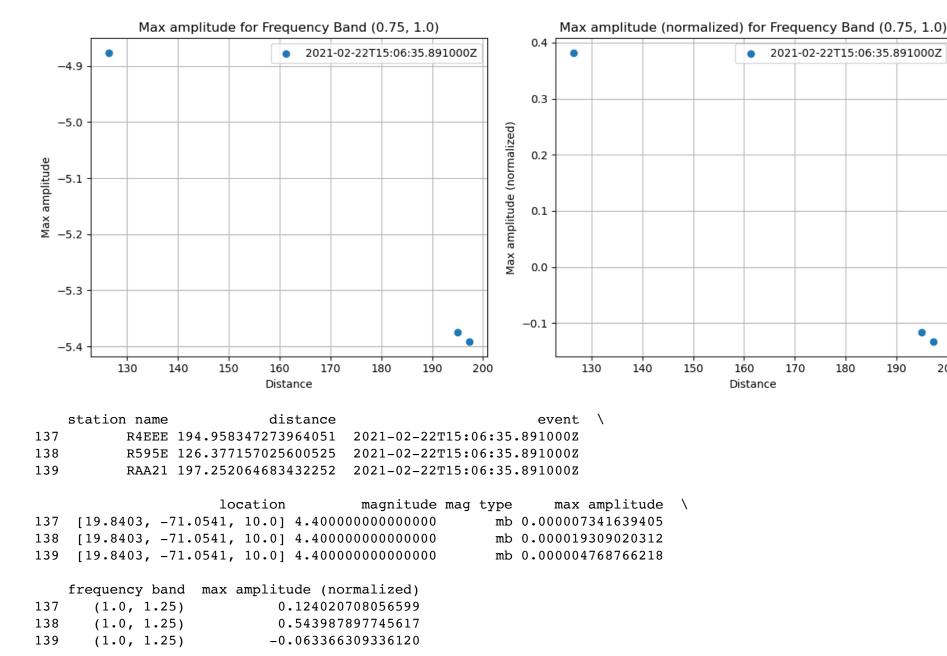
(1.0, 1.25)

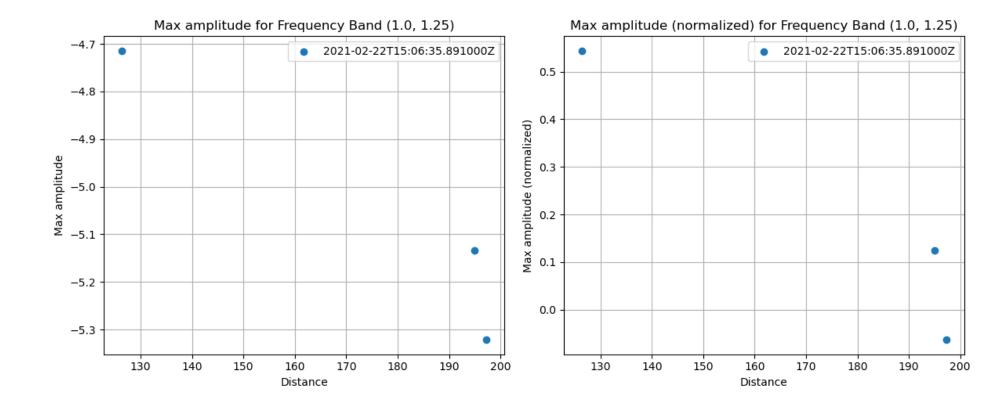








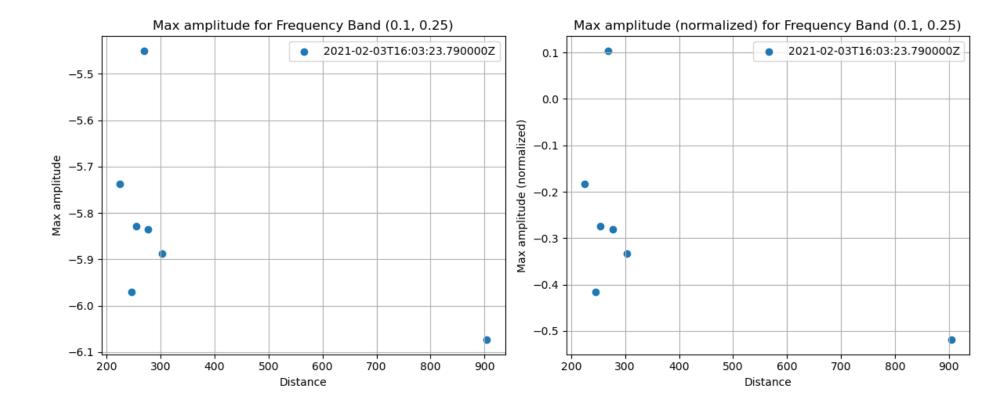




```
station name
                            distance
                                                             event
140
           R34A9 276.448964525551446
                                      2021-02-03T16:03:23.790000Z
141
           R3E0C 904.159956087788146
                                      2021-02-03T16:03:23.790000Z
142
           R4DB9 245.897258514659399
                                      2021-02-03T16:03:23.790000Z
143
           RCCD1 268.568770093039689
                                      2021-02-03T16:03:23.790000Z
144
           RD17E 224.707141477152106
                                      2021-02-03T16:03:23.790000Z
145
           RD4D8 254.353897726109722
                                     2021-02-03T16:03:23.790000Z
146
           RE1CC 302.945638417220835
                                     2021-02-03T16:03:23.790000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
    [19.0905, -68.8785, 8.0] 4.180000000000000
140
                                                      md 0.000001462277511
141 [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000000844349855
142 [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000001070475482
143 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000003545184047
144 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001834055503
145 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001487021190
146 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001297438192
    frequency band max amplitude (normalized)
140
       (0.1, 0.25)
                            -0.280583350476042
141
       (0.1, 0.25)
                            -0.519090717885361
       (0.1, 0.25)
142
                            -0.416036426468438
       (0.1, 0.25)
143
                             0.104025635119354
       (0.1, 0.25)
144
                            -0.182200676926279
145
       (0.1, 0.25)
                            -0.273295993891955
```

146

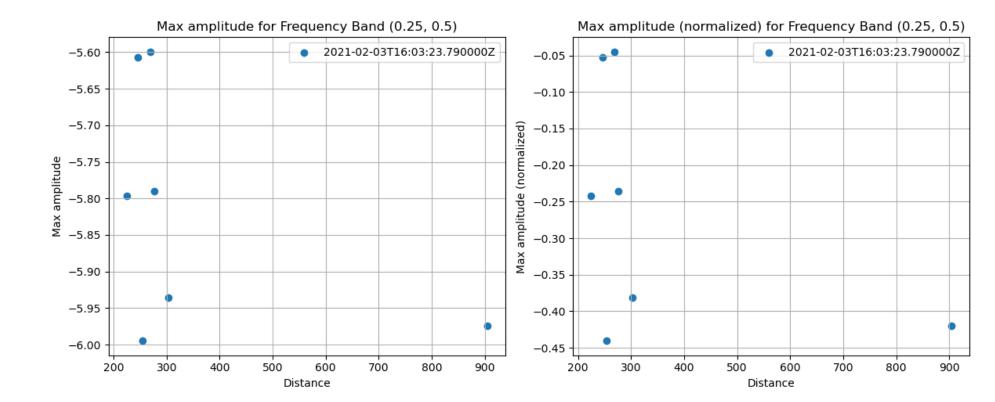
(0.1, 0.25)



```
station name
                            distance
                                                            event
147
           R34A9 276.448964525551446
                                      2021-02-03T16:03:23.790000Z
148
           R3E0C 904.159956087788146
                                      2021-02-03T16:03:23.790000Z
149
           R4DB9 245.897258514659399
                                      2021-02-03T16:03:23.790000Z
150
           RCCD1 268.568770093039689
                                      2021-02-03T16:03:23.790000Z
151
           RD17E 224.707141477152106
                                      2021-02-03T16:03:23.790000Z
152
           RD4D8 254.353897726109722 2021-02-03T16:03:23.790000Z
153
           RE1CC 302.945638417220835
                                     2021-02-03T16:03:23.790000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
   [19.0905, -68.8785, 8.0] 4.180000000000000
147
                                                      md 0.000001621414053
148
    [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000001060670679
149 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000002472436089
150 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000002515965375
151 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001598506221
152 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001011909263
153 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001159558406
    frequency band max amplitude (normalized)
147
       (0.25, 0.5)
                            -0.235719218461289
148
       (0.25, 0.5)
                            -0.420032587733223
       (0.25, 0.5)
149
                            -0.052488077073299
150
       (0.25, 0.5)
                            -0.044908491222706
151
       (0.25, 0.5)
                            -0.241898820431565
152
       (0.25, 0.5)
                            -0.440471579736715
```

153

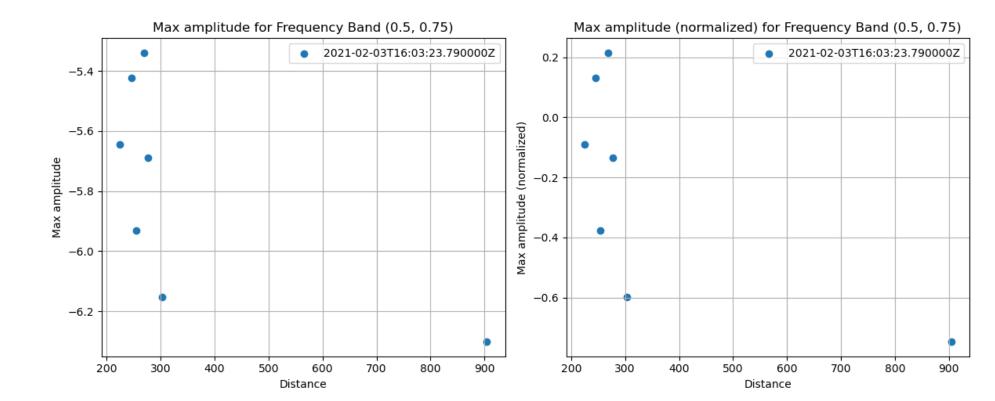
(0.25, 0.5)



```
station name
                            distance
                                                             event
154
           R34A9 276.448964525551446
                                      2021-02-03T16:03:23.790000Z
155
           R3E0C 904.159956087788146
                                      2021-02-03T16:03:23.790000Z
156
           R4DB9 245.897258514659399
                                      2021-02-03T16:03:23.790000Z
157
           RCCD1 268.568770093039689
                                      2021-02-03T16:03:23.790000Z
158
           RD17E 224.707141477152106
                                      2021-02-03T16:03:23.790000Z
159
           RD4D8 254.353897726109722
                                     2021-02-03T16:03:23.790000Z
160
           RE1CC 302.945638417220835
                                     2021-02-03T16:03:23.790000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
154 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000002053884333
155
    [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000000498954488
156 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000003777343925
157 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000004582634302
   [19.0905, -68.8785, 8.0] 4.180000000000000
158
                                                      md 0.000002267116022
159
    [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000001170991727
    [19.0905, -68.8785, 8.0] 4.180000000000000
160
                                                      md 0.000000704867726
    frequency band max amplitude (normalized)
154
       (0.5, 0.75)
                            -0.133037169116252
155
       (0.5, 0.75)
                            -0.747552217843945
       (0.5, 0.75)
156
                             0.131573377729480
       (0.5, 0.75)
157
                             0.215502050328388
158
       (0.5, 0.75)
                            -0.090139404990152
159
       (0.5, 0.75)
                            -0.377059324498950
```

160

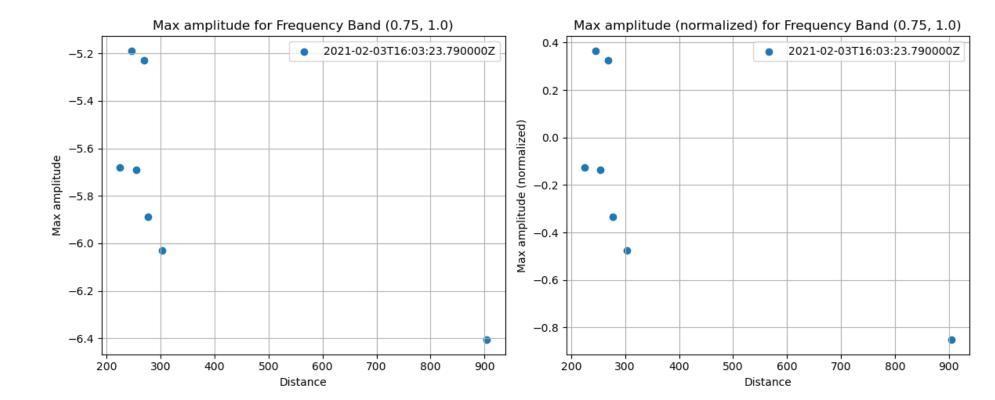
(0.5, 0.75)



```
station name
                            distance
                                                             event
161
           R34A9 276.448964525551446
                                      2021-02-03T16:03:23.790000Z
162
           R3E0C 904.159956087788146
                                      2021-02-03T16:03:23.790000Z
163
           R4DB9 245.897258514659399
                                      2021-02-03T16:03:23.790000Z
164
           RCCD1 268.568770093039689
                                      2021-02-03T16:03:23.790000Z
165
           RD17E 224.707141477152106
                                      2021-02-03T16:03:23.790000Z
166
           RD4D8 254.353897726109722
                                     2021-02-03T16:03:23.790000Z
167
           RE1CC 302.945638417220835
                                     2021-02-03T16:03:23.790000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
161
    [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000001294083438
162 [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000000392305791
163 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000006476976809
164 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000005904885210
   [19.0905, -68.8785, 8.0] 4.180000000000000
165
                                                      md 0.000002083883263
166 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000002042847435
167 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000000933078570
    frequency band max amplitude (normalized)
       (0.75, 1.0)
161
                            -0.333650872079529
162
       (0.75, 1.0)
                            -0.851988431658668
       (0.75, 1.0)
163
                             0.365759190850877
164
       (0.75, 1.0)
                             0.325598308213634
165
       (0.75, 1.0)
                            -0.126739764540950
       (0.75, 1.0)
166
                            -0.135377217500755
```

167

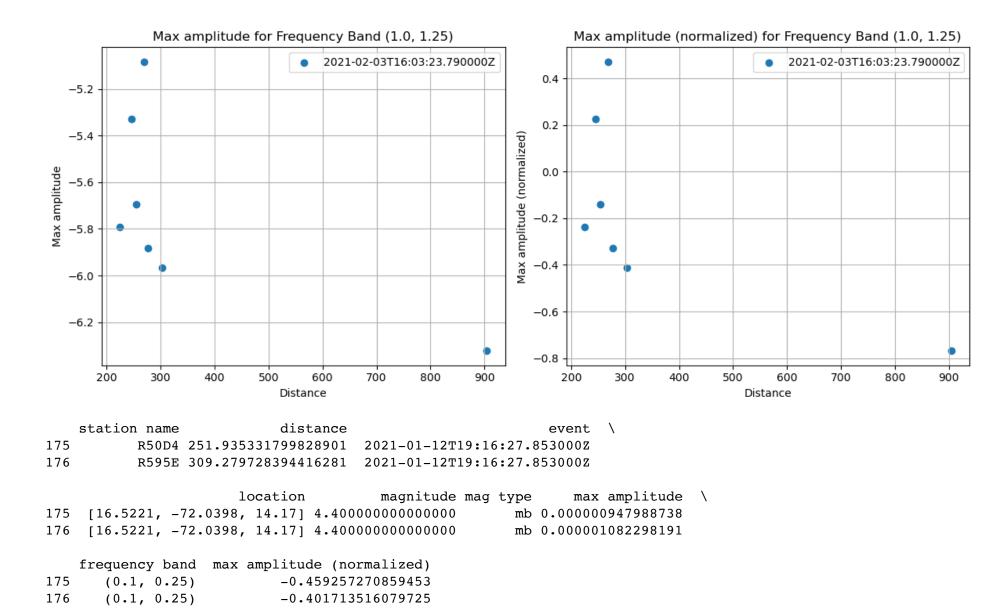
(0.75, 1.0)

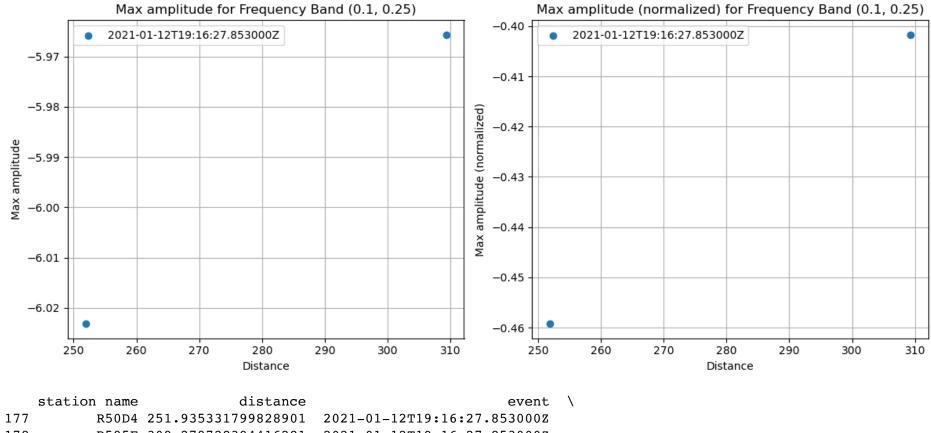


```
station name
                            distance
                                                             event
168
           R34A9 276.448964525551446
                                      2021-02-03T16:03:23.790000Z
169
           R3E0C 904.159956087788146
                                      2021-02-03T16:03:23.790000Z
170
           R4DB9 245.897258514659399
                                      2021-02-03T16:03:23.790000Z
171
           RCCD1 268.568770093039689
                                      2021-02-03T16:03:23.790000Z
172
           RD17E 224.707141477152106
                                      2021-02-03T16:03:23.790000Z
173
           RD4D8 254.353897726109722
                                     2021-02-03T16:03:23.790000Z
174
           RE1CC 302.945638417220835
                                     2021-02-03T16:03:23.790000Z
                     location
                                      magnitude mag type
                                                             max amplitude \
    [19.0905, -68.8785, 8.0] 4.180000000000000
168
                                                      md 0.000001308983958
169
    [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000000475403797
170 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000004685028845
171 [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000008255930814
172 [19.0905, -68.8785, 8.0] 4.180000000000000
                                                      md 0.000001609936066
173 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000002013303970
174 [19.0905, -68.8785, 8.0] 4.18000000000000
                                                      md 0.000001076924324
    frequency band max amplitude (normalized)
168
       (1.0, 1.25)
                            -0.328678827134132
169
       (1.0, 1.25)
                            -0.768550504825305
       (1.0, 1.25)
170
                             0.225099117873688
       (1.0, 1.25)
171
                             0.471152893627439
172
       (1.0, 1.25)
                            -0.238804521667918
173
       (1.0, 1.25)
                            -0.141703801290801
```

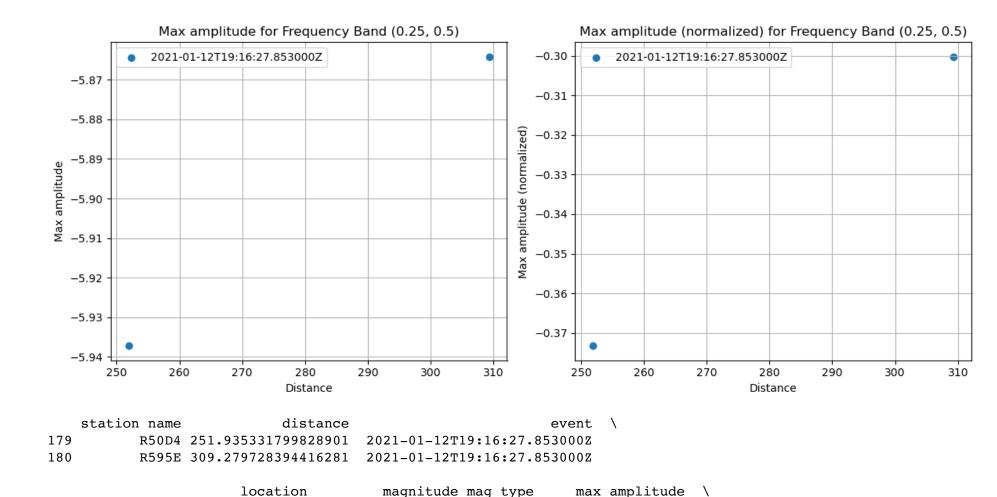
174

(1.0, 1.25)





```
178
          R595E 309.279728394416281 2021-01-12T19:16:27.853000Z
                       location
                                       magnitude mag type
                                                              max amplitude \
177 [16.5221, -72.0398, 14.17] 4.400000000000000
                                                       mb 0.000001155604625
178 [16.5221, -72.0398, 14.17] 4.400000000000000
                                                       mb 0.000001367148162
    frequency band max amplitude (normalized)
       (0.25, 0.5)
                           -0.373251177399696
177
178
       (0.25, 0.5)
                           -0.300244865786743
```



mb 0.000001169280925

mb 0.000001027414617

179 [16.5221, -72.0398, 14.17] 4.400000000000000

180 [16.5221, -72.0398, 14.17] 4.400000000000000

frequency band max amplitude (normalized)

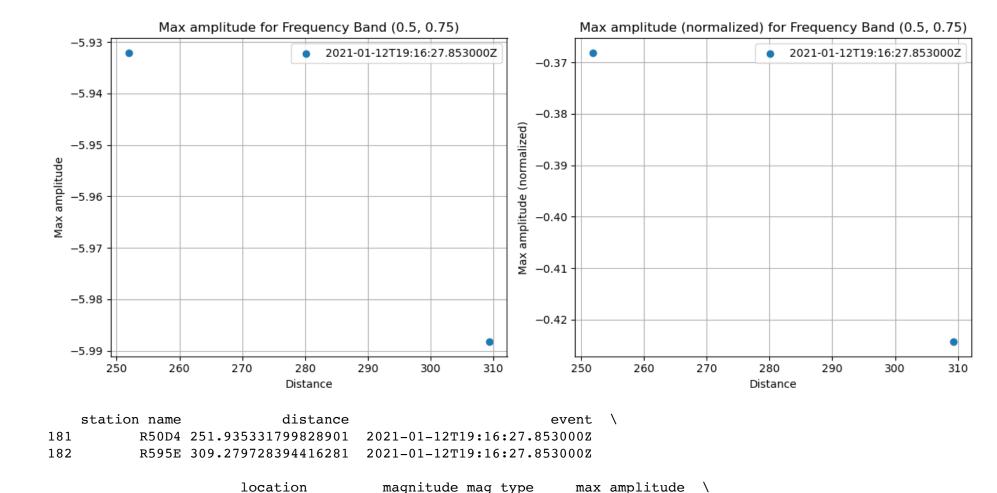
-0.368141583735087

-0.424314708437135

(0.5, 0.75)

(0.5, 0.75)

179



mb 0.000001186120558

mb 0.000001208089783

181 [16.5221, -72.0398, 14.17] 4.400000000000000

182 [16.5221, -72.0398, 14.17] 4.400000000000000

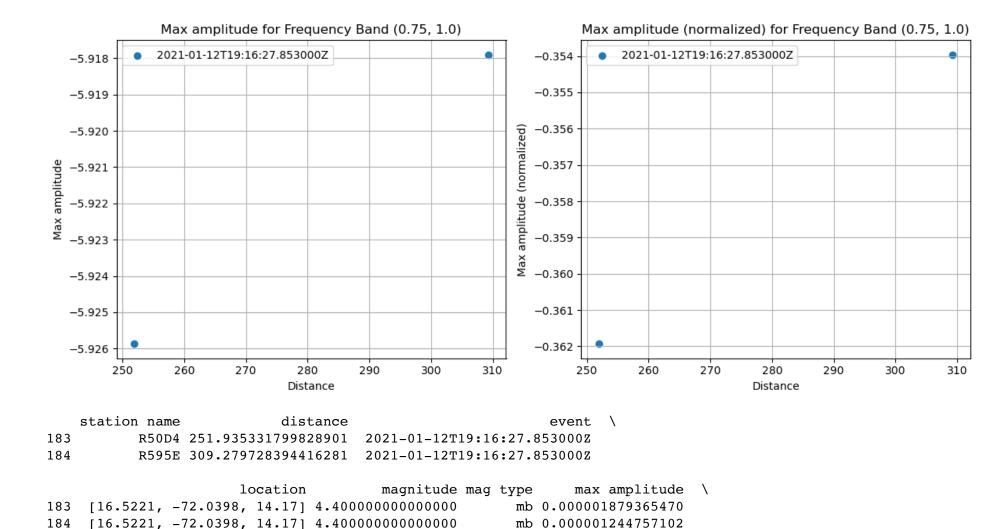
frequency band max amplitude (normalized)

-0.361931615297146

-0.353961237262676

(0.75, 1.0)

(0.75, 1.0)



frequency band max amplitude (normalized)

-0.162049205475080

-0.340975835662342

(1.0, 1.25)

(1.0, 1.25)

183

