



UNIVERSITY
of HAWAII®
MĀNOA

ATMO XXX
CLASS NAME HERE
FALL 2023

Lab 00
Title of the lab

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1 Questions

Q1 Question 1 goes here in bold

answer goes here with a reference as an example (“Anatomy of a Hurricane (U.S. National Park Service)”, n.d.).

- a) **Subquestion 1**
Answer goes here

- b) **Subquestion 2**
Answer goes here.

- c) **Subquestion 3**
Answer goes here

Q2 Question 2 goes here in bold

You can insert code files also

```
1  % This is just a test file, it does nothing but random operations
2
3  % Make a wavelet analysis of a random signal
4
5  % Make a random signal
6  x = randn(1,1000);
7
8  % Make a wavelet analysis
9  [wt,period,scale,coi] = cwt(x,'morse',1,'VoicesPerOctave',48);
10
11 % Plot the wavelet analysis
12 figure
13 contourf(1:1000,period,abs(wt))
14 set(gca,'yscale','log')
15 hold on
16 plot(1:1000,coi,'k','linewidth',2)
17 hold off
18 xlabel('Time')
19 ylabel('Period')
20 title('Wavelet analysis of a random signal')
21
22 % End of file
```

The first dimension is the number of vertical bins (125) and the second dimension is the number of profiles (37082). The maximum value for each vertical bin is plot in Figure 1.

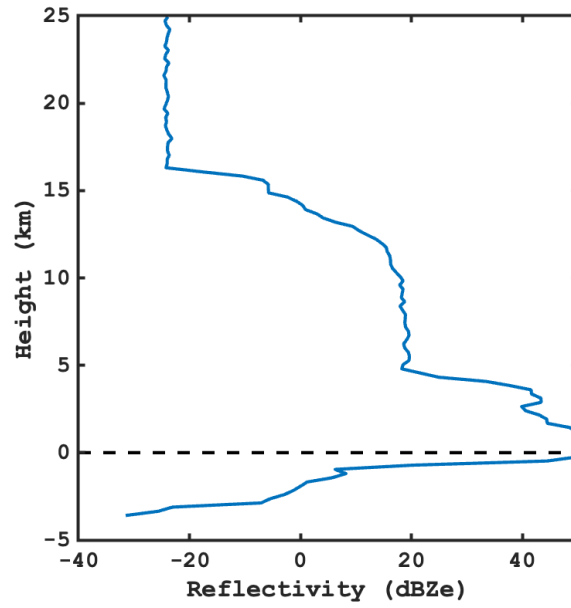


Figure 1: Maximum reflectivity for each vertical bin. The dashed line on bin 105 (0km) correspond to the closest height to mean sea level.

Q3 Question 3 goes here in bold

answer goes here.

Q4 Question 4 goes here in bold

answer goes here.

References

Anatomy of a hurricane (u.s. national park service). (n.d.). Retrieved October 5, 2023, from <https://www.nps.gov/articles/anatomy-of-a-hurricane.htm>

2 Figures



Figure 2: A nice capybara.



Figure 3: Same capybara

3 Code

Python

test.py

This code is used to generate figures 2 and 3.

```
1  # This is just a test file, it does nothing but random operations
2
3  # Make a wavelet analysis of a random signal
4
5  import numpy as np
6  import matplotlib.pyplot as plt
7  import pywt
8  import random
9
10 # Create a random signal
11 N = 1000
12 t = np.linspace(0, 1, N)
13 x = np.zeros(N)
14 for i in range(N):
15     x[i] = random.random()
16
17 # Make a wavelet analysis
18 w = pywt.ContinuousWavelet('mor1')
19 scales = np.linspace(1, 100, 100)
20 coef, freqs = pywt.cwt(x, scales, w, dt=1/N)
21
22 # Plot the results
23 plt.figure()
24 plt.subplot(211)
25 plt.plot(t, x)
26 plt.subplot(212)
27 plt.contourf(t, freqs, coef)
28 plt.show()
29
30 # End of file
```
