METHODS in ANALYTICAL METEOROLOGY and OCEANOGRAPHY

LEARNING ACTIVITY SHEET

Exercise #4 **Date:** 22 October 2021

Activity Title : Data in z space

Learning Target(s): Assess degree of mixing or stability of atmosphere/ocean using vertical profiles

The density of an air or water parcel relative to its surroundings determine whether it ascends or descends vertically. It is thus important to be able to determine state (density/stability) based on temperature, pressure, moisture content, gas content.

Exercise:
Using the RAOBS website of University of Wyoming, select 1 sounding site and your desired time period

1. Download single radiosonde data
    1. Make variable(T,RH)-depth(P) plots
    2. Determine tropospheric height
    3. Plot single skew-t

    For PYTHON users, use SIPHON and METPY or see https://unidata.github.io/python-training/gallery/skewt_example/

    For MATLAB users, scripts getsounding.m skewt.m and tropopause_height_ko.m are in classdrive, also available from https://ocw.mit.edu/courses/earth-atmospheric-and-planetary-sciences/12-811-tropical-meteorology-spring-2011/tools/

2. Download a whole year of data for 2020
    1. Make plots for averaged upper air conditions for JAN and JULY (either variable-pressure or skew-t plots). If you can't do averages, single sounding plots (Jan vs July) will do.
    2. Discuss if there are seasonal differences apparent in your selected site using plots or tables

Reference:
COMET-SKEWT (https://www.meted.ucar.edu/mesoprim/skewt/index.htm)

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