

# EAS372      Assignment 1      Due: 4 Feb., 2010

Please submit a tidy, organized report covering the two exercises below. Report should be single-sided, double spaced and the page limit is **three**, not counting figures.

## Part I (5%)

Choose a sounding that interests you: download the Skew T-log P diagram, and the underlying observations. Compute the following quantities based on formulae we have covered.

- potential temperature (referred to 1000 hPa) of the air at 700 hPa (compare your computed value with that deduced by an operation – which you should describe – on the thermodynamic chart);
- vapour pressure, absolute humidity, specific humidity, mixing ratio, and relative humidity of the air at 850 hPa.

## Part II (5%)

Compute a one week time series (two points per day) of the Edmonton 1000-500 hPa thickness, by interpolating between contours on the CMC 500hPa analyses at 00Z and 12Z.

Let any given point in this series be labelled  $\Delta Z_i$  ( $i = 1 \dots 14$ ). Compute the mean value  $\overline{\Delta Z}$  of your thickness time series, and form the series

$$q_i = \frac{1}{2} (\Delta Z_i - \overline{\Delta Z}) \quad (1)$$

(the factor of two corresponds to the relationship between changes in thickness and changes in mean layer temperature). Graph your time series  $q_i$ . Alongside, but with an arbitrary offset on the  $q$ -axis, plot the time series of the following (crudely-computed) layer mean temperature,

$$T_i = \frac{1}{9} \left[ 2T_i^{(850)} + 3T_i^{(700)} + 4T_i^{(500)} \right] . \quad (2)$$