

Cross-Section Analysis

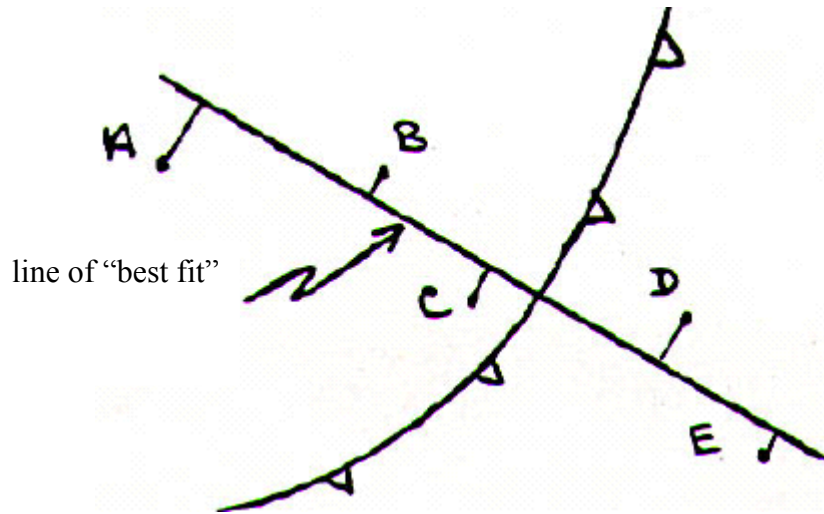
Purpose: To illustrate the vertical structure of the atmosphere and to complement horizontal analyses in diagnosing the three-dimensional structure. It is especially useful in determining the location of jets, baroclinic zones and other stable layers.

Procedure: There are four major steps in constructing a useful cross-section analysis:

A. Analysis of the soundings

From a horizontal chart, identify the feature(s) you want to analyze: e.g., a front, jet stream, etc. Then determine a “line” of rawinsonde stations (A, B, C, D, E) which is perpendicular to this feature (see Fig. 1).

Fig. 1



B. Identification of stable layers

The second step is to locate the stable layers and tropopause in each of the soundings. If some of the stable layers represent fronts and can be identified on two or more adjacent soundings, they should be connected. The tropopause should be connected where it is behaving as a material surface. Use the frontal and tropopause models discussed in class.

C. Transfer of sounding features

The fronts, tropopause, and remaining stable layers found on the sounding chart should be copied on to the cross-section analysis chart which has all the data plotted directly above the station.

D. Cross-section analysis

On the cross-section chart, perform scalar analyses of temperature, potential temperature and wind speeds. Be sure to adhere to the models described in the lecture when drawing for data in and near stable layers.