1. INTRODUCTION and OBJECTIVE

During the last years, the tropopause region has received an increased interest as the transition boundary that separates the troposphere from the stratosphere, two regions with significantly different aspects: dynamics, radiation and chemistry. Tropopause is characterized by changes in atmospheric properties (temperature vertical gradient, potential vorticity and chemical species), therefore there are several definitions. In the present study, the location of the tropopause is obtained by applying the dynamical and thermal definitions, for the Northern Hemisphere and latitudes extratropical (20°-80°) and only the pressure of the tropopause is considered. Seasonal climatology of the tropopause pressure for the period (1960-2001) of the ERA-40 reanalysis data for both definitions have been compared.

2. SEASONAL CLIMATOLOGIES

Mean seasonal pressure structure for the thermal and dynamical tropopause is clearly similar but there is a higher variability for the dynamical tropopause. An overestimation of the dynamical tropopause versus thermal tropopause is observed, particularly in summer and above the subtropical jet stream.

3. PROFILES and TRENDS

There is a good relationship between the meridional profiles of thermal and dynamical definitions, especially in winter. Dynamical tropopause pressure (height) is slightly higher (lower) than the thermal tropopause in both seasons. The dynamic’s results are within the range of one standard deviation of the thermic’s results.

4. CONCLUSIONS

- First thermal tropopause and dynamical tropopause of 3.5PVU reflect a similar structure.
- An overestimation of the dynamical tropopause versus the thermal tropopause is observed and it’s higher above the subtropical jet stream in summer.
- The meridional profiles show a good agreement between both tropopauses, and a same pattern in the trends is observed for the period (1960-2001).