

60° < latitude < 90°

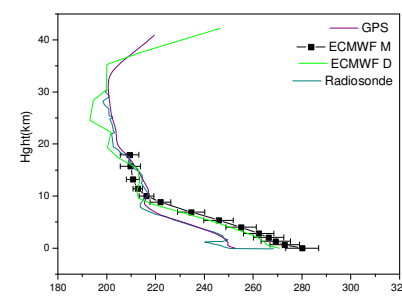
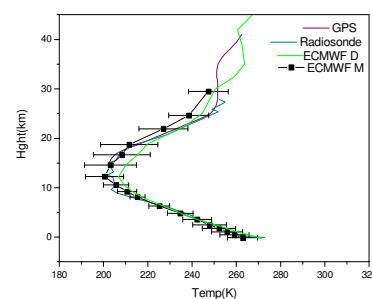
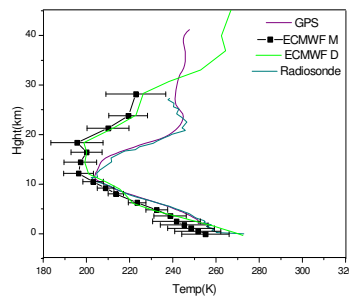
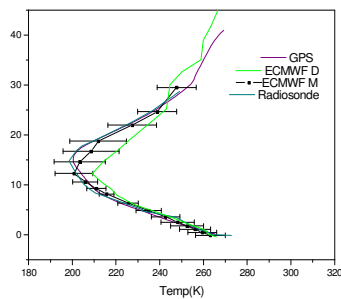
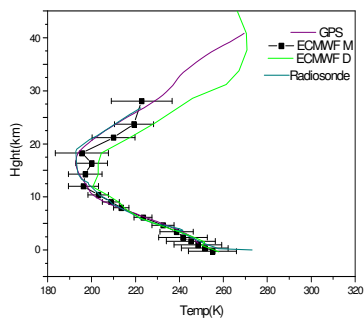


Figure 1. Vertical profiles derived from radiosonde data, reanalysis daily values, reanalysis monthly means value and GPS RO for SYOWA on a) October 04, 2001, CHAMP b) November 08, 2001 CHAMP c) CASEY October 20, 2001, CHAMP d) November 03, 2001, CHAMP e) May 17, 2002, CHAMP

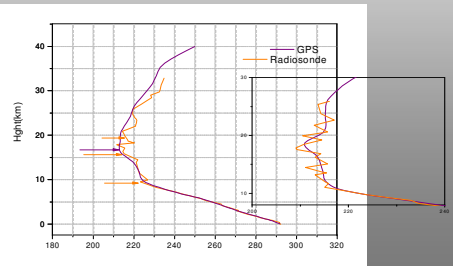
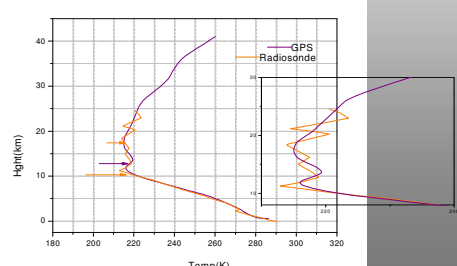
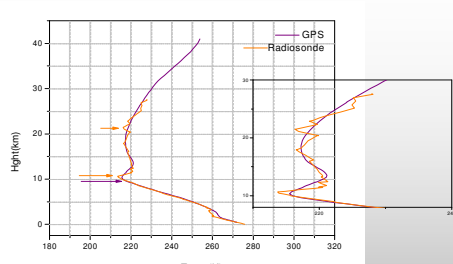
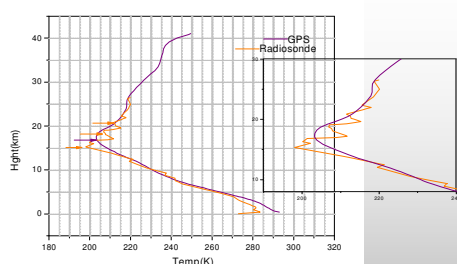
Station number	/Dev/(K) GPS 8-20 km	/Dev/(K) GPS 20-30 km	/Dev ± σ (K) ERA 40 8-20 km	/Dev ± σ (K) ERA40 20-30 km
87623	1 – 10	3 – 4	6 ± 2 - 9 ± 8	1 ± 8 - 10 ± 5
93112	1 – 4	1 - 6	3 ± 4 - 13 ± 8	1 ± 6 - 8 ± 8
93844	2 – 7	1 - 6	6 ± 4 - 10 ± 2	3 ± 8 - 8 ± 3
88889	2 – 4	2 - 6	3 ± 5 - 10 ± 4	5 ± 5 - 14 ± 9

Table 2. Value of deviation in kelvin derived of GPS and means monthly value ERA40 from radiosonde measurements. First (last) number in each column represent minimum (maximum) value of deviation for each station from radiosonde data. The ERA40 value are accompanied of the monthly standard diversion.

EZE 87576	Date	P(LRT1) (hPa)	H(LRT1) (km)	LRT1	P(LRT2) (hPa)	H(LRT2) (km)	LRT2	P(LRT2) (hPa)	H(LRT2) (km)	LTR3
Radiosonde	2001-05-23 12Z	104	16062	205.1	24	25178	273.7	13.6	28810	214.3
GPS	14.47	190.6	12364.7	214.4	---	---	---	---	---	---
Radiosonde	2001-06-08 12Z	179	12748	207.1	44.6	21214	208.1	---	---	---
GPS	11.37	188.2	12459.6	211.5	---	---	---	---	---	---
Radiosonde	2001-09-04 12Z	229	11077	215.1	---	---	---	---	---	---
GPS	16.50	171.9	12919.5	214.8	---	---	---	---	---	---
Radiosonde	2001-09-12 12Z	194	12258	210.5	---	---	---	---	---	---
GPS	03.37	147	14029.8	208.1	---	---	---	---	---	---
Radiosonde	2001-11-04 12Z	258	10394	222.7	134	14652	210.3	---	---	---
GPS	11.45	253.9	10535.9	226	---	---	---	---	---	---
Radiosonde	2001-11-15 12Z	287	9496	222.3	109	15804	215.3	62	19372	216.4
GPS	14.41	97.1	16546	213.2	---	---	---	---	---	---
Radiosonde	2002-03-12 12Z	89.1	17259	198.9	---	---	---	---	---	---
GPS	10.23	99.6	16628.5	201.9	---	---	---	---	---	---
Radiosonde	2002-05-29 12Z	229	10999	217.1	135	14345	214	64	18999	211.8
GPS	13.37	105.5	15908.2	212.4	---	---	---	---	---	---
Radiosonde	2002-06-16 12Z	210	11629	211.3	---	---	---	---	---	---
GPS	03.27	205.6	11733.6	215.5	---	---	---	---	---	---

Table 3. Tropopause parameters derived from RS and GPS retrievals for EZE as example of station under study. Values show the presence of LRT1, LRT2, LRT3 for some events from data collected from radiosonde, while values derived from GPS can detect only the first lapse rate.

b) TROPOPAUSE



CONCLUSION

- The comparison reveals best agreement with radiosonde profiles for GPS RO than for reanalysis product, both daily and monthly means values : small biases are detected at levels below tropopause level and around it. In spite of this, their profiles presents a slight trend to underestimate temperature values at altitudes below 10 km, even in temperature tropopause in most cases.
- The ERA40 daily and monthly mean values show biases more prominent at tropopause level as well as in the the lower stratosphere. Profiles shows a overestimation for temperature values.
- While RS data show the presence of LRT1, LRT2 and even LRT3 in almost all the station under study, GPS retrievals can detect in most cases only LRT1. By using the same procedure for RS, GPS RO do not reveal the presence of LRT2 and LRT3, as Table 3 show
- For the stations under study here, the presence of the multiple tropauses, derived form RS data, occurs not only over the ocean in the S.H., but also over coastal and land stations with percentages with maximum values around 40% as EZE .