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The ozone layer is recovering in mid-latitudes?

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During the recent decades there has been an increasing concern related to ozone layer and solar ultraviolet radiation, UV-B (280-320 nm), reaching the surface of the earth. The Antarctic Ozone Hole (AOH) is a phenomenon of strong ozone depletion in the Antarctic stratosphere, this is a consequence of heterogeneous chemical reactions and dynamical processes which enhance ozone losses by reactions with chlorine. Punta Arenas (53.0S,70.9W) is the southernmost city in Chile with a population of approximately 120000. Due to its location, well within the area affected by the Antarctic Ozone Hole. Systematic observation of ozone and UV-B with a Brewer spectrophotometer have been made in order study during the ozone hole conditions. In addition, the vertical distribution using ozosonde has been investigated during campaigns in spring time and in 2009 started regularly ECC-ozonesonde measurements, also since 2002 measurements of the ozone vertical distribution using Umkehr technique have been carry out. Intercomparisons with different ozone measurement platforms were presented. Particularly we compared a DIAL ozone vertical profile in Rio Gallegos (Argentina) with an ozonesonde measurement launched in Punta Arenas. The results were in good agreement over the 16-32 km altitude range. Also, here we present measurements of column ozone, vertical distribution of ozone and ultraviolet radiation UV-B made in Punta Arenas and Magallanes region to period 1992-2009. To analyze the behavior of the stratospheric ozone layer over Magallanes was used the reference AVE-CLI-TOMS minus twice the standard deviation of the reference mean (TOMS;1978-1987, mean monthly – 2SD). The number of days per year shows an interesting cycle of 8 to 10 years, but monthly variations did not show a significant decrease, especially during September-October period.