Geophysical Research Abstracts, Vol. 9, 06253, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-06253

GPS derived Integrated Water Vapour content and its relationship with 6 years of surface radiation balance at MZS (Terra Nova Bay)

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A wide variety of monitoring networks are nowadays working in polar regions. GNSS-GPS networks are constantly increasing the number of observing sites and most of the times GPS systems are co-located with sensors used for investigating other scientific fields. A full exploitation of GPS networks can therefore be achieved through interdisciplinary studies; a very rewarding exchange of information is realized when applying GPS derived IWV to atmospheric and climate investigation. In particular, at MZS (74° 41' S, 164° 07' E) a permanent GPS system is observing since 1998 and it is co-located with two radiometers that started operations in 2000. The aim of this study is to investigate the relationship between the radiation fluxes and the GPS-derived atmospheric IWV. Surface incoming shortwave and longwave fluxes for clear sky conditions were isolated from a 6 years dataset, spanning December and January austral summer months. These measurements were collected with a pyranometer and a pyrgeometer, both integrated in the CNR1 - Kipp&Zonen instrument, primarly for the evaluation of clouds and aerosols radiative effects on the local climate. Additional information provided by GPS technique unable us to evaluate the role of IWV on the radiation measurements. Inter-annual variability of the IWV and its radiative contribution on the local climate will be investigated. The measured radiation will also be compared to the output values obtained through Radiative Transfer Codes (RTC), forcing their runs with measured surface and atmospheric profiles of meteorological parameters (T, p, RH).