

# THE LOW ATMOSPHERE TURBULENCE AT DOME C

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## Abstract

In the search for the ultimate ground-base astronomical site, Antarctica is being extensively studied and has already shown considerable advantages over temperate sites currently hosting the largest telescopes. Within the continent, Dome C differentiates itself by being on a local elevation maximum of the Antarctic plateau. In consequence, the lower part of the atmosphere suffers less from the katabatic wind which is the main cause of seeing in Antarctica. Here, we present the first turbulence profiles taken at Dome C in winter using a SODAR. This instrument is part of the site testing AASTINO project deployed in 2002/2003 by the University of New South Wales in collaboration with the IPEV and Italianartide. We discuss the implications of the turbulence for astronomy and compare it with previous measurements at the South Pole.

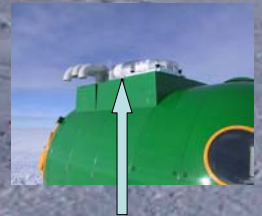
### What do we know so far?

- Dome C (3,250m) is higher than the South Pole (2,836m) => Less atmosphere to look through
- Dome C is on a local maximum of the Antarctic Plateau => Katabatic wind weaker than at the South Pole (2 m/s at Dome C, 5.4 m/s at the South Pole). We expect less turbulence and therefore better seeing.

Let's verify this!

### The Instrument

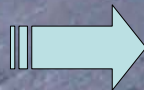
- SODAR Remtech PA-1
- Measures  $C_t^2$  and 3D wind profile
- Average range of 900m at 40db background
- Vertical resolution 30m
- Temporal resolution 20minutes



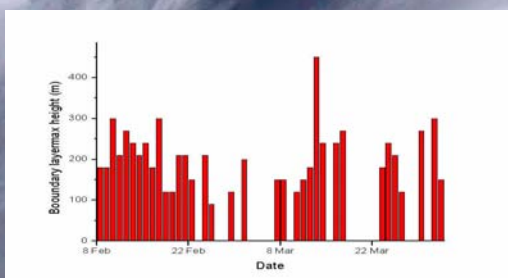
Sodar antenna installed on the AASTINO

### The Data

- Data gathered since the day of closure of the station (9<sup>th</sup> of February)
- Data presented here covers 9/2 => 17/4
- 60 profiles per day (from 3am to 11pm)
- Updated daily via Iridium Satellite



Do we need the Eiffel tower to get above the boundary lower?



Ground wind speed:

