



## Thermal turbulence in the very stable boundary layer: sodar observations at Dome C, Antarctica

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The characteristics of the atmospheric turbulence inside the extremely stable boundary layer are not well understandable till now. The knowledge of the properties of the atmospheric turbulence is important to understand the influence of the atmospheric surface layer thermal turbulence on distortion of astronomical images and the propagation of electromagnetic waves for telecommunication purposes. During a campaign carried out at Concordia station at Dome C, East Antarctica, in winter 2012, an experiment was made to determine the behaviour of the atmospheric turbulence in the lower a few hundred meters. The surface layer in the interior of Antarctica during winter is extremely stably stratified with the temperature inversion strength reaching 30-40 °C. The behaviour of the thermal turbulence was observed and measured both remotely using a specially designed high-resolution sodar, and in situ sonic anemometer measurements. Statistics of some meteorological variables including long-wave downwelling radiation characterising the presence of cloudiness are presented. Typical patterns of the turbulence determined by sodar are analysed. Statistics of the stable boundary layer height are presented. Wave activity inside the turbulent layer was observed during the major part of the time. The main characteristics of the wavy structures were determined.