EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-163, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9th European Conference on Applications of Meteorology
High resolution meteorology
- applications and services

Boundary Layer Profiles of Winds and Turbulence Statistics using a Scanning Doppler Lidar

R. Frehlich and Y. Meillier
University of Colorado, CIRES, Boulder, United States (rgf@cires.colorado.edu)

Recent developments in Doppler lidar technology have produced operational systems for real-time measurements of boundary layer profiles of horizontal winds and turbulence statistics. New lidar scanning patterns and signal processing algorithms have demonstrated reliable high resolution capabilities that are ideally suited for the most challenging conditions such as stable night time boundary layers with low turbulence and light winds. The most interesting new information is contained in the profiles of small scale turbulence which are essential for defining the boundary layer mixing height which is important for numerical weather prediction model parameterization and for transport and diffusion models. Recent results are presented for typical convective conditions and more challenging stable conditions. The lidar derived profiles are compared to high resolution in situ measurements from an instrumented blimp and to nearby tower measurements. Critical science and operational issues are discussed to help guide future research efforts.