Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10156, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10156
EGU General Assembly 2008

Large Eddy Simulations of the Atmospheric Flow over the Gaudergrat Ridge

C.W. Higgins (1), M.B. Parlange (1), M. Lehning (2), F. Faure (2), and C. Meneveau (3)

(1) School of Architecture, Civil and Environmental Engineering, EPFL, Lausanne, Switzerland, (2) Swiss Federal Institute for Snow and Avalanche Research, SLF, Davos, Switzerland, (3) Department of Mechanical Engineering, Johns Hopkins University, Baltimore, USA

A detailed understanding the atmospheric flow over complex alpine topographies is of key importance in predicting the deposition of snow on alpine peaks, and ensuing avalanches. In these steep terrains (slope>40 degrees), terrain following schemes employed in most mesoscale models break down. In this research, a Large Eddy Simulation (LES) code using the immersed boundary method is first validated against wind tunnel data of flow over a steep three dimensional Gaussian hill. Here, comparisons are favorable in both flow velocity and variance profiles. The validated LES code is then used to perform high resolution simulations of the atmospheric flow over the Gaudergrat ridge located in eastern Switzerland where slopes are in excess of 45 degrees. These simulation results are further compared against lower resolution mesoscale models of the same region as well as in-situ measurements from the intensive GAUDEX 2003 measurement campaign.