

BLOWING SNOW EXPERIMENT AT HALLEY STATION, ANTARCTICA (ABSTRACT)

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The Stable Antarctic Boundary Layer Experiment (STABLE) 1991 carried out at Halley station, Antarctica by the British Antarctic Survey was four experiments run in conjunction and the blowing experiment was run as part of this programme. The following instrumentation was installed on a mast:

- 1) Cup anemometers at 2, 4, 8 and 16 m.
- 2) Platinum resistance thermometers at 0.5, 1, 2, 5 and 10 m.
- 3) Humicap humidity sensors at 0.5, 1, 2, 5 and 10 m.
- 4) Snow particle counters at 0.2, 0.5, 1, 2, 5 and 10 m.

All the data were stored with 0.1 Hz. Halley is an ideal site for boundary layer studies since the Brunt Ice Shelf has a very small slope and extends for about 40 km inland. The surface is fairly uniform and characterized by small sastrugi which results in a large homogeneous and open area. The data obtained over the winter showed not only the horizontal flux of blowing snow as a function of wind speed and other factors such as temperature and snow age but also the relationship between surface roughness and friction velocity under blowing snow conditions.

More detailed analysis now going on will reveal the effective diffusivities for momentum, water vapor, heat and snow particle numbers which are fundamental to the use of an eddy diffusion model to predict the snow, humidity, heat and momentum balances. In addition, similarity theories to account for the mean temperature and humidity profiles will be discussed. They may break down in the presence of blowing snow.

Current theories assume a steady state and the only continuous observations extending over periods of more than a few minutes have been of integrated quantities such as the total mass flux. This study will make the onset and ending of periods of drifting snow clear as well.

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