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Application of LES to blowing snow

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Drifting snow is an important issue in both engineering and climatological fields. On roads, drifting snow causes snowdrifts and reduced visibility. In mountainous regions, nonuniform distribution of snow due to blowing snow, leads to avalanche release. Redistribution of snow by blowing snow is also important for hydrological processes and mass balance in polar regions. Although recent numerical research, based on RANS method, has revealed many basic properties of drifting snow, in reality, spatial and temporal variations is significant in blowing snow. In this study, we applied Large-Eddy Simulation (LES), which is superior in the unsteady calculation of the turbulence phenomenon, to blowing snow. Calculated concentrations fluctuate because of the wind turbulence: the concentrations show similar fluctuating characteristics to the wind. Instantaneous concentrations on a horizontal plane exhibit strong spatial variability. The vertical correlation of the instantaneous concentrations is not significant if the height difference exceeds 1m.

Keywords: Blowing snow, LES