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Satellite based bio-geophysical parameter mapping and aggregation modelling for weather prediction and climate models

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Abstract

The non-linear area-averaging or aggregation is performed by the method of Hasager and Jensen (1999, Q.J.R.Meteorol. Soc, 125, 2075-2102). The model is a linearized flow model where the advection term is balanced by the diffusion term. Model equations are solved by Fast Fourier Transforms, hence the model is computationally fast. The highly non-linear turbulent responses at each roughness step-change between all patches in the landscape are taken into consideration. The resulting average or effective surface roughnesses for momentum and for energy are used as input in the HIRLAM model. Results of using improved surface boundary conditions in HIRLAM will be validated from wind and temperature data at synoptic weather stations and surface flux data from land- and ocean meteorological masts in Denmark.