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Operational daily snow extent products from EUMETSAT weather satellites

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In this work, we describe two currently operational H SAF snow extent products (H31 MSG/SEVIRI and H32 Metop/AVHRR) which provide daily data about snow extent.

These H SAF snow extent products have been developed for meteorological and hydrological applications, such as additional information for numerical weather prediction. They are both based on single sensor data and are independent of any outside data sources, such as surface observations and weather model data.

The H SAF MSG/SEVIRI provides daily snow extent for the full MSG/SEVIRI disk. The MSG/SEVIRI snow extent product has been operational since 2008. The H SAF Metop/AVHRR snow extent product reached operational status 2018, but the product is available since 2015. It provides global daily snow extent data in 0.01x0.01 degree lat-lon grid.

Both products are based on optical channels which provide excellent spatial resolution. The MSG/SEVIRI product benefits also of the high temporal resolution which allows snow detection throughout the day. We employ semi-empirical approach which uses thresholding method based on subjective classification of over half a million satellite pixels. During the development of the algorithms we have aimed to provide an algorithm which prefers accuracy even if it means some pixels are not classified.

Recent validation results based on surface observations of snow depth and the state of the ground are very good and suggest that these products could have excellent potential for applications which need information about snow cover extent.

We describe the products, show recent validation results and some examples of the products. Similar products are expected to be available when the next generation EUMETSAT weather satellites will become operational.