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Setting the basis for a high-resolution European fog/low stratus climatology

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Low clouds have been shown to play an important role as a modifier in the global climate system. Fog more specifically also has a direct impact on human safety and quality of life. The spatially accurate mapping of low stratus and fog distribution has posed problems in the past, not to speak of climatological aggregation. Newest generation geostationary satellite data for the first time provide the potential for automated high-resolution fog and low stratus detection and thus climatological evaluation. This is exploited here for the generation of climatologies. The retrieval methodology used is based on Meteosat 8 SEVIRI (Spinning-Enhanced Visible and Infra-Red Imager) data. A combination of spectral and spatial tests serves to identify low stratus clouds; a microphysics-based analysis of cloud vertical extent further allows for the delineation of (ground) fog areas.

This paper presents some initial satellite-based "climatologies" of low stratus and fog for Europe, based on SEVIRI data, which has been available since 2004. The climatologies have a nominal spatial resolution of 3km; the high temporal resolution of the data (15min) allows for the computation of parameters such as average fog/low stratus hours per day and average fog dissipation time. In this way, the temporal aggregation of the SEVIRI-based fog/low stratus products can contribute to the understanding of inter- and intra-annual variability of fog and low stratus distribution at various spatial scales, and set a sound basis for long-term climate change monitoring.