



Characterisation of mineral dust emission in the Middle East using Remote Sensing techniques

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Using the Spinning Enhanced Visual and InfraRed Imager (SEVIRI) on-board Meteosat's second generation satellite (MSG), mineral dust emission from the Middle East was observed on a 15 minute temporal and 4-5 km² spatial resolution over the entire year of 2006. This research provides a subjective derivation of mineral dust source locations in the Middle East using the thermal infrared Dust RGB product. This methodology will be used to build up a dust climatology of the region across the current lifespan of the SEVIRI mission (currently 2006 to present). Focusing on the brightness temperature difference around 10.8 μm channel and their spectral contrast with clear sky conditions, the Dust RGB product has been recognised as a major asset in detecting dust in important areas such as the Sahara. This would be the first attempt at using this methodology in one of the dustiest regions in the world, second only to the Sahara Desert. For every dust storm generated within the Middle East, the point of first emission is derived from visual inspection of each 15 minute image, these points were then recorded in a database, along with time and direction of dust movement. To take account of potential errors inherent in this subjective detection method, a degree of confidence is associated with each data point with relevance to time of day (which has a strong effect on ability to detect dust in these products) and climatic conditions, in particular presence of clouds. The process was replicated by 2 different observers to allow determination of the variation inherent in this subjective method.