



Interannual variability in dust emissions from the western Sahara: links to the West African Monsoon.

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The western Sahara is a strong dust source region, particularly in the boreal summer months. There are a range of mechanisms responsible for initiating dust emission here, which have been verified based on case studies from various field campaigns. However, the relative importance of different mechanisms is as yet unclear. Here we present evidence, using an automated dust detection scheme developed for use with SEVIRI, which suggests that interannual variability in dustiness from the western Sahara is strongly tied to variability in the West African Monsoon. The summer of 2005 was particularly dusty in comparison to the period 2004-2010, largely due to the occurrence of three exceptionally large dust events. Climatologically the summer was characterised by an enhanced south-westerly monsoon flow, more northwards mean location of the ITD, increased moisture over the whole Saharan region, and enhanced cloud cover over the Saharan fringe. This northwards displacement of the monsoon system favours the repeated occurrence of deep, moist convection over the strong source regions of the western Sahara, which initiated the three anomalous events. 2005 is also characterised by notable sea surface temperature anomalies globally and especially in the Gulf of Guinea and tropical Atlantic, and anomalously high geopotential over north Africa which favours an enhanced monsoon. We therefore suggests that interannual variability in dustiness from the western Sahara is tied to interannual variability in the strength and northward extent of the West African Monsoon.