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The effect of a soil moisture wave on the Atmosphere over West Africa

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A strong pattern in soil moisture was observed across the continent during late July 2006, which took the form of a wave with approximately the same wavelength as a typical African Easterly Wave (AEW) in the atmosphere. It is suggested that the passage of a strong AEW was responsible for leaving the distinct soil moisture pattern due to rainfall from Mesoscale convective systems.

The atmospheric response to this coherent pattern in the surface wetness is investigated. As part of the AMMA field campaign, the British FAAM aircraft flew East to West transects across this pattern at 15.5N on 28/07/06. Data from this flight was analysed along with dropsondes launched during the flight, and the results are compared to model evaluations of the event using the Met Offices Unified Model (UM) and Limited Area Model (LAM).

It is suggested that land surface properties have an effect on low level atmospheric dynamics, and that this is also likely to feedback into the properties of the AEW.