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An analysis of an intense precipitation event over West Africa using TIGGE data

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African easterly waves (AEWs) and their embedded mesoscale convective systems are important weather systems of the West African monsoon, providing generally beneficial rains to the semi-arid region of the Sahel. Occasionally, however, these systems become very intense and have been known to cause localized to regional flooding. One of these events occurred over Ouagadougou in Burkina Faso in late August/early September of 2009, when >260mm of rain fell in a 12 hour period, displacing large amounts of people from their homes.

Forecasting these kinds of high impact weather and the possible ranges of intensity or evolution that can be supported by the large scale environmental conditions is essential. Important guidance for this can be obtained from ensemble forecasts. To assess how much information is present in the ensembles of the THORPEX Interactive Grand Global Ensemble (TIGGE) data, an EOF and cluster analysis is performed to identify distinct AEW scenarios that are contained in the ensemble data. The goal is to assess how much information is present in the low resolution ensembles that can be used to identify this convective event, and to provide suggestions on how TIGGE data could be used for downscaling purposes.