

## ELF Q-bursts from African Squall Lines

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A number of large amplitude ELF transient signals (Q-bursts) are documented at multiple sites around the world (Japan, Hungary, Israel, South Pole, and USA) in association with westward moving mesoscale convective systems (MCSs) in West Africa during the African Monsoon and Multidisciplinary Analysis campaign in 2006. Some of these bursts are associated with red sprites firstly observed from ground-based measurement in Africa. Using MIT Doppler radar and electric field measurements locally installed in Niamey, we investigate quantitatively the meteorological conditions responsible for generating these powerful Q-bursts. Detailed meteorological information is provided from radar such as the spatio-temporal evolution of radar echo, while the electrical properties of large Q-bursts (e.g. charge moment change (CMC)) are experimentally derived from a remote-sensing method based on theory for the Earth-ionosphere waveguide.