

2.9 DUAL-POLARIZATION RADAR OBSERVATIONS OF DEEP CONVECTION OVER THE LAKE VICTORIA BASIN IN EAST AFRICA

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Lake Victoria in East Africa supports the livelihood of thousands of fisherman and it is estimated that 5000 deaths occur per year over the lake. It is believed that these fatalities are due to localized, severe winds produced by intense thunderstorms over the lake during the rainy season and larger scale, intense winds over the lake during the dry season. The intense winds are causing rough state of the lake (Big wave heights) that cause fishermen boats to capsize.

The Tanzania Meteorological Agency operates an S-band polarimetric radar in Mwanza, Tanzania, along the south shore of Lake Victoria. Observations show that there is a pronounced diurnal cycle of storm formation in the Lake Victoria Basin region. During the daytime, storms develop and intensify over the higher terrain surrounding the lake. This pattern is reversed at night with storm formation over the lake. The nocturnal thunderstorms are well observed by the Mwanza radar and are strongly forced by sea breezes, land breezes and gust fronts. Unexpected is the detection of clear air echo (backscattering by insects) to ranges ≥ 100 km over the lake that makes it possible to observe clear air winds, gust fronts and other convergence lines over the lake. Tracking the movement of thunderstorms and these low level convergence lines provide the opportunity to nowcasts intense winds and also subsequent thunderstorm development.

We will present examples of these radar features and discuss efforts that are currently underway at the Tanzania Meteorological Agency to use the radar observations to verify and to improve the performance of numerical weather prediction fields.