

# **A multi-instrument measurement of a mesospheric front-like structure at the equator**

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We have made a comprehensive measurement of a front-like structure in the mesosphere at the equator at Kototabang, Indonesia ( $0.2^{\circ}$ S,  $100.3^{\circ}$ E), using an airglow imager, an airglow temperature photometer, a meteor radar, and the SABER instrument on board the TIMED satellite. The event was detected in airglow images of both OH-band (peak emission altitude: 87 km) and 557.7-nm (96 km) emissions, as east-west front-like structure propagating northward with a velocity of 52-58 m/s. Wave trains with a horizontal wavelength of 30-70 km were observed after the passage of the front. The airglow intensity decreased for all the mesospheric emissions of OI (557.7 nm), OH-band, O2-band (altitude: 94 km), and Na (589.3 nm) (90 km) after the front passage. The rotational temperatures of both OH-band and O2-band also decreased  $\sim 10$  K. An intense shear in northward wind velocity of 80 m/s was observed at altitudes of 84-90 km by the meteor radar. Kinetic temperature profile at altitudes of 20-120 km was observed near Kototabang by TIMED/SABER. The front-like structure and trailing waves were similar to those of the mesospheric tidal bore. However, we found that the ducting condition, which is necessary to form a bore, was not satisfied for the observed wave parameters. We speculate that the intense wind shear may play some role for generation of the front-like structure.