A curved gravity-wave structure in the mesospheric airglow images

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We found a unique wave structure, which had arc-like curved wave fronts in high contrast, by using an all-sky airglow imager located at Shigaraki (34.9N, 136.1E) on October 3, 2002. The curved structures were identified over 2.5 hours (1330-1600UT: 2230-0100LT) both in the OI (557.7 nm, emission altitude: 96 km) and OH-band (720-910 nm, 86 km) images. The wave structures had a wavelength of about 40 km and propagated northeastward with a horizontal phase velocity of about 80 m/s. Assuming that each wave pattern originated from a point source in the troposphere, the center of the curvature was projected on the sea near the tip of the Kii peninsula (33.5N, 135.1E). From the radar-AMeDAS precipitation map and an IR-image obtained by the GMS-5 satellite, we found a localized thundercloud developing at this area. The curved wave was probably generated from this source. In the presentation, we will discuss vertical propagation of this unique wave using background wind data in the middle atmosphere from NCEP reanalysis data, CIRA-86, and the MU radar.