

# Long-term statistical analysis of the ionospheric observation with the MU radar

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An incoherent scatter radar (ISR) is a powerful tool to observe various ionospheric parameters. The ISR enables us to estimate various physical quantities in the ionosphere from the spectrum of the radar backscatters. The MU radar located in Shigaraki, Japan has regularly been operated as the ISR since the beginning of the MU radar operation in 1986. Electron and ion temperatures, ion drift, and echo power are observed and released in a public database. We have conducted a long-term statistical analysis of the IS observation with the MU radar from 1986 to 2019. The results are mostly consistent with the past results and IRI model outputs. The results during the deep solar minimum in the previous solar cycle show a large discrepancy between the observation and IRI model.

Keywords: MU radar, Ionosphere, Incoherent scatter observation