

Characteristics of ELF waves in the ionosphere by simultaneous measurements of satellite and ground-based experiment

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Propagation characteristics of the low frequency electromagnetic waves in the ionosphere are experimentally derived using simultaneous measurement of electromagnetic waves from intensive lightning by satellite and ground-based observations. The lightning location and its electric characteristics are continuously monitored from ELF method whilst the low altitude satellite (DEMETER) successfully detects the electromagnetic waves over the same lightning source propagating through the ionosphere. Direct comparison of ELF waves observed by satellite with ground experiments give the unique opportunity to derive the experimental ionospheric property such as an ionospheric transmission loss. The ionospheric transmission loss is obtained for different latitude and local times, and can be compared with the theoretical expectations.