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木星オーロラ電波の長期変動特性-II

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Long-term variable nature of Jupiter's auroral radio emissions - II

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It is known that Jupiter's auroral radio emission (hereafter "JAR") shows long term occurrence variations with the time scale of about a decade. The variations were first considered to be initiated by the solar and/or solar wind activities since the variations seemed to inversely correlate with the solar activity in 1960's. A longer term analysis were made in 1970's and showed that the variations relate with the Jovicentric declination of the earth (De) rather than the solar and/or solar wind activities. So far, their plausible causalities are considered to be mainly brought by the two geometrical effects; i.e., De relates to amount of reachable rays to the earth from the source regions, and the geocentric declination of Jupiter relates to incidence angle of the radio wave to the terrestrial ionosphere and varies the ionospheric shielding level (e.g. Oya+, 1984). However, when we think the solar cycle dependence on the terrestrial auroral radio activity (e.g. Kumamoto+, 2003), the solar and/or solar wind control directly affecting JAR may not be negligible for the long term variations.

In order to assess such the proposed causalities and the other effects, we have investigated occurrence features of Jupiter's radio emissions using the radio wave data observed by the WIND satellite with equal-quality for almost 30 years. We have derived occurrence probabilities from the data observed in the frequency range of about 0.7 to 14MHz ("HOM" to "DAM" radio wave ranges) for each timing around Jupiter's opposition. In the presentation, we will show the long time variable nature of JAR particularly for its CML (Central Meridian Longitude) occurrence dependence and evaluate possible causalities.