

Expected source regions of Jupiter' s hectometric radio components viewed from their polarization characteristics

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It has been known that Jupiter' s auroral radio emission in the hectometric wave range (HOM) is roughly classified into two type occurrence components. One is a component relating to solar wind variations (sw(solar wind)-HOM) appearing around CML (Central Meridian Longitude of an observer) $\sim 180^\circ$ when solar wind pressure enhances. The other one is generally more intense than sw-HOM and has no or weak relation with solar wind variations (nsw(non sw)-HOM) appearing around CML $\sim 110^\circ$ and $\sim 280^\circ$ (the 1st and 2nd nsw-HOM, respectively) when De (Jovicentric declination of an observer) $\sim -1^\circ$ (Nakagawa et al., 2000; Nakagawa, 2003). Recently, we found one more nsw-HOM component appearing around CML $\sim 340^\circ$ (the 3rd nsw-HOM), which highly correlates occurrence of magnetic reconnection events in Jupiter' s magnetotail region (Misawa et al., 2018). This component is an important role for the studies of global magnetospheric dynamics of Jupiter since it is a possible remote marker of the reconnection events occurring in Jupiter' s magnetosphere. However, due to difficulty in precise direction finding in the hectometric wave range, the radio source of this component (and also those of the other components), that is, location of transported energy input should be originated from the tail region, has been still unrevealed.

In order to investigate source location of each HOM component we have made their polarization analyses using the data provided by High Frequency Analyzer (HFA) which is a subsystem of Plasma Wave Experiment (PWE) onboard the Arase (ERG) spacecraft. Preliminary analyses show that the 3rd nsw-HOM is left-handed circular polarization. The result suggests that the 3rd nsw-HOM is radiated from the southern hemisphere by taking account of Jupiter' s magnetic polarity. In the presentation, we will discuss possible sources of the 3rd nsw-HOM based the polarization analyses by comparing the expected observable rays calculated from Jupiter' s magnetic field models, and will also show polarization characteristics and expected source regions of the other HOM components.

Keywords: Jupiter, hectometric radiation, polarization, source region