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Polarization response of the attenuation bands within Jupiter's hectometric radio emissions observed by Cassini/RPWS

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It is believed that the attenuation band within Jupiter's HOM is significant to help understand the source locations of HOM as well as the plasma environment around Jupiter. We have investigated the statistical analysis of Jovian HOM polarization plotted as a function of Jovian magnetic latitude and frequency below 3 MHz using the Cassini Radio and Plasma Wave Science (RPWS) data from Oct. 2, 2000 to Mar. 22, 2001. As a result, we found that the attenuation band plays a crucial role in not only reducing specific regions of occurrence probability and average intensity, but also amplifying the occurrence probability and average intensity of the HOM emissions next to the attenuated regions. This new additional information suggests a method of indirectly estimating the plasma environment around Jupiter by means of the ray-tracing technique. We present the polarization response of the attenuation bands within Jupiter HOM and a model which takes into account the amplified HOM radiation via ray-tracing technique.

Keywords: Jupiter's Hectometric Radio Emissions, Attenuation Bands, Cassini Spacecraft, Jupiter's Radio Occurrence Probability Map, Jupiter's Radio Average Intensity Map, Jupiter's Magnetic Field