What do we know from activities of Jupiter's radio emissions? - III

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Since the early 1990s, observations for Jupiter's aurora have been intensively made in UV and IR ranges. Auroral phenomena are one of good indicators of magnetic activities of planetary magnetospheres. Planetary radio phenomena also tell us the magnetic activities, but our knowledge seem to be limited since we do not realize well where and how the radio emissions are generated, particularly for the emissions which have no relation with the Galilean satellites.

We have made comparative surveys between Jupiter's UV aurora and HOM to DAM radio activities using the aurora data observed with the ACS instrument onboard the Hubble Space Telescope (HST) and radio wave data observed with the WAVES instrument onboard the WIND satellite. The Planetary Atmospheres and Space Science Group of Boston University made intensive observations for the Jovian aurora from February to June, 2007 using HST. The observations provided a precious opportunity to make precise source surveys of the radio emissions.

From precise comparison analyses between variations of radio bursts and those of auroral intensities, it is suggested that radio intensities of non satellite controlled component show low correlation with the main bright oval regions and high latitude polar emission regions, but some correlation with dawn side diffuse region or the swirl regions located at relatively lower latitudes. This result implies that the observed Jupiter's radio emisions inform us magnetic activities in the middle to outer magnetosphere outside the quasi-corotation region cconnected to the main oval region. This further suggests some correlation should be detected between magnetic activities in the middle magnetosphere and observed radio emissions. In order to examine this hypothesis we have made a comparative survey between the in-situ magnetic field data measured by Galileo and the WIND/WAVES radio data.

In the presentation, we will discuss what observed radio phenomena inform us by introducing the comparative surveys between auroral and radio activities, and in-situ magnetic field and remotely observed radio emission data.

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