

Observational study on the source characteristics of the Jovian multiple Quasi-Periodic burst

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Jovian multiple QP burst (Morioka et al., 2006), which occurs in the LF/VLF band with quasi-periodicities (a few to tens of minutes), has been observed by Galileo and Cassini in the equatorial region. Some studies discussed directivity and several occurrence characteristics of the radio component (Hospodarsky et al., 2004; Morioka et al., 2006). Simultaneous observations of Jovian radio and auroral activities recently performed by Galileo and Cassini spacecraft suggested that quasi-periodic burst of short period (a few minutes) is associated with polar UV auroral variations (Pryor et al., 2005).

However, fundamental properties of the radio component, especially source region, are still unclear. In order to reveal the source mechanisms of multiple QP burst, detailed statistical approach was performed based on the wave data observed by Galileo/PWS. The results indicate that multiple QP burst has the shadow zone in the equatorial region less than 30 R_J and occurs in a particular rotational phase (triggered at SSL~290 deg (SSL : Sub Solar Longitude) and lasts for 5.5 h). These results imply that the multiple QP burst emits from the polar region and propagates toward the equatorial region, and it has time dependent source activation occurring once per planetary rotation (flashing light behavior). To confirm the effects of the visibility and time-dependent source, the ray tracing approach is going to be performed comparing with the observed results, and the source location of the multiple QP burst will be discussed in this presentation.

References

Hospodarsky et al., J. Geophys. Res., 109, A09S07, 2004.

Morioka et al., J. Geophys. Res. 111, A04233, 2006.

Pryor et al., Icarus, 178, 312-326, 2005.