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Periodic bursts of non-Io DAM and its relationship to Jovian aurora phenomena

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Periodic radio bursts of the non-Io component of Jovian decametric radio emission (non-Io DAM), recently revealed in the dynamic radio spectra recorded by STEREO/WAVES, Wind/WAVES and Cassini/RPWS, typically recur during several Jovian days with an averaged period of $\sim$10.07 hours which is $\sim$1.5% longer than the rotation period of the Jovian magnetosphere. The bursts are observed in a decametric frequency range from $\sim$4 MHz to $\sim$12-16 MHz between 300° and 60° of Jovian Central Meridian Longitude (CML). The stereoscopic multispacecraft observations have shown that the radio sources of the periodic bursts sub-corotate with Jupiter and can be active during several Jupiter rotations.

In this study we discuss the relation between the occurrence of the periodic radio bursts of non-Io DAM, solar wind activity at Jupiter and sub-corotating long lasting ultraviolet arcs of Jovian aurora. The aurora phenomena were imaged by the Hubble Space Telescope during two aurora campaigns in winter 2000 /2001 and February - March and May - June 2007. We suggest that the periodic non-Io DAM bursts and sub-corotating UV arcs are deeply connected with the complex interaction between the Jovian magnetosphere and co-rotating highly structured plasma environment.