

Ionospheric Alfvén resonance observed at a low-latitude station, Wakuya

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Ionospheric Alfvén resonance (IAR) can be identified in dynamic power spectrum plot as a spectral resonance structure in the frequency range of 0.1 Hz - 7.0 Hz. Most of previous studies about IAR were done for mid- to high-latitudes. Only a few studies reported IAR at low latitude station, Creta (33.1 deg geomagnetic latitude (GMLAT)) [e.g., T. Bosinger et al., 2004]. There is a report that no IAR was found near Tokyo [Hayakawa, 2004]. We, however, observed a clear signature of IAR in data obtained by an induction magnetometer at Wakuya (29.7 deg GMLAT). To our knowledge, this is an IAR observed at the lowest geomagnetic latitude. Then we performed a statistical study using the induction magnetometer data recorded at Wakuya from 2007 to 2009. The sampling rate of the data is 15 Hz. We identified IAR by a criterion that a spectral harmonic structure has three bands. IAR occurred from evening to dawn with the maximum occurrence rate around 0300 LT. There is a seasonal variation that few events were found in May to September, but there were a lot of events in October to April. The harmonic frequency gradually increases over evening to post midnight, reaches the maximum around 0300 LT, and then decreases until dawn. The average frequency difference between two adjacent harmonics dF also has seasonal change. dF is larger in winter than in summer. The occurrence rate of IAR has no clear relation to the Dst index, while it has a weak negative correlation with the Kp index.