



Pulsations of the Auroral Kilometric Radiation in the Pc-1 frequency range

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Sporadic events of AKR pulsations at frequencies from 1 to 3 Hz have been found in the high resolution data obtained from the WBD (Wideband Data) plasma wave receivers mounted on the four spacecraft of the Cluster mission. Such frequencies are typical for Pc-1 pulsations (range 0.2 to 5 Hz) of the Earth's magnetic field. A single chain of AKR pulsations contains up to a few tens of pulses, more or less regularly spaced. The event under analysis shows a characteristic decreasing frequency of the pulse repetition. Pulsating AKR emission has been observed in the AKR frequency range from 50 to 80 kHz simultaneously by all four satellites. Pc-1 magnetic field pulsations are usually interpreted as an evidence of electromagnetic ion-cyclotron (EMIC) waves. It is believed that EMIC waves can be generated in the Pc-1 range at frequencies near the proton cyclotron frequency, in the dayside magnetosphere in the plane of the magnetic equator. A Tamao [1964] model has been considered in order to explain the falling frequency of AKR pulse repetition. In this model the lower pulsation frequencies propagate as Alfvén waves along the larger L magnetic field lines, whereas the higher pulsation frequencies propagate along the smaller L magnetic field lines which results in different wave travel times for different L values. An electron density model of Denton et al. [2004] was used in the calculation of the velocity of the Alfvén wave propagation. The best fit for the falling pulse frequency has been reached when the Denton electron density was divided by a factor of 1.8.