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Signatures of the Ionospheric Alfven Resonator in the polar cap region

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Since 2002 the Polar Geophysical Institute (PGI) of the Russian Academy of Science carries the continuous observations of the magnetic fluctuations in the range of 0.1-10 Hz by means of the induction coil magnetometer at the observatory Barentsburg on Svalbard (L=13). Spectrograms obtained from the magnetometer data often demonstrate the presence of the spectral resonance structures (SRS) that are believed to be a consequence of a resonator for Alfven waves, which existence is suggested in the upper ionosphere. Such SRS are often observed at low latitudes and in the auroral zone. (Up to now, there was no information on the SRS observations at L$>$5.) The particle precipitation data from low-orbiting satellites as well as auroral oval models show that during the SRS observations the observatory is well poleward of the auroral oval, most likely in the polar cap region. Similar to the auroral zone, the occurrence rate of SRS in Barentsburg is higher in night time then in daytime as well as it is higher in winter than in summer. The SRS occurrence rate decreases when the geomagnetic activity increases. In contrast to the auroral zone, where SRS disappear during substorm related PiB pulsations, these phenomena can co-exist in polar cap region. Perhaps, this is because at high latitudes PiBs appear as result of the waveguide propagation, but does not relate to the source overhead.