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Escape of the Auroral Kilometric Radiation from a thin plasma cavity

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According to recent observations, the Auroral Kilometric Radiation (AKR) sources are thin plasma cavities oriented tangentially to the auroral oval and aligned with the background magnetic field. They have a small latitudinal width as compared with their longitudinal extent. Plasma of AKR sources is tenuous with electron population essentially composed of energetic particles with a horseshoe velocity distribution that drives the cyclotron maser instability. There is a problem in studies of cyclotron maser instability in a localized space region with a reduced density: how the radiation generated below the cutoff frequency of the external cold plasma would escape from a source or, in other words, gets onto the branch of the cold plasma dispersion. The results of our investigation of the AKR escape from a thin plasma cavity made under an assumption of the geometric optics are presented. We have examined effects of plasma and magnetic field inhomogeneities, existing in the background cold plasma and inside a source region, on the AKR exit from a source.