



PIC simulations of wave-mode conversion on the plasmopause

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We study a conversion process from the electron Bernstein modes to electromagnetic free space modes using a 2D-3V electromagnetic PIC code with predefined particle density irregularities. We use a Gaussian profile of the particle density irregularity along the external magnetic field. Our results show the electron Bernstein modes generated by the ring-beam instability in the dense plasma region as well as their conversion into the electromagnetic waves. The resulting free space mode waves propagate out of the dense region perpendicular to magnetic field with the corresponding energy flux. Our simulation results are compared with measured data from Cluster and Van Allen Probes spacecraft. This wave mode conversion process might help us to explain generation of electromagnetic waves over the plasmopause density gradient.