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The ion cyclotron turbulence generated by a low frequency kinetic Alfven wave, and the related turbulent heating of ions[1]
VOLODYMYR S. MYKHAYLENKO, VOLODYMYR V. MYKHAYLENKO, HAE JUNE LEE, Pusan National University, South Korea — The ion cyclotron instability driven by the strong kinetic Alfven wave is investigated as a possible source of the anisotropic heating of ions in the coronal holes and solar wind. We present a novel model of a plasma with coupled inhomogeneous current and the sheared flow, which follows from the studies of the particles motion in the electric field of the kinetic Alfven wave of the finite wavelength. The investigation is performed employing the non-modal kinetic theory grounded on the shearing modes approach. The solution of the governing linear integral equation for the perturbed potential displays that the flow velocity shear, which for the corona conditions may be above the growth rate of the ion cyclotron instability in plasma with steady current, changes the exponential growth of the ion cyclotron potential on the power function of time, that impedes the growth of the unstable ion cyclotron wave and reduces the turbulent heating rate of ions across the magnetic field.

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