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Gyrokinetic Particle Simulation of Mirror Instability[1] HONGPENG QU, ZHIHONG LIN, LIU CHEN, University of California, Irvine — Magnetic mirror instability is the slow magnetosonic wave driven unstable by the anisotropic pressure in collisionless high-beta plasmas. In previous analysis, it is found that the maximum growth rate increases with perpendicular wave number until the perpendicular wavelength becomes comparable to the ion-gyroradius. Therefore, the finite Larmor radius effects are important in determining the threshold and the wavelength of the kinetic mirror instability. We have developed a general dispersion relation of the mirror mode with finite Larmor radius effects. In the short wavelength limit, we find that the finite Larmor radius effect has stabilizing effects. Besides, the coupling to the slow sound wave is also found to be stabilizing. Linear gyrokinetic particle has recovered the linear dispersion relation. Nonlinear simulation will be carried out to study saturation mechanism of mirror instability.

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Zhihong Lin
University of California, Irvine

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