

## Nonlinear Evolution of Mirror Instability

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Coalescence of the mirror mode structures in nonlinear stage has been found in our previous study. Through the coalescence, the scale size of the mirror mode structure in the transient coalescence process of the three-dimensional model ( $\sim 40$  ion inertial lengths) becomes in good agreement with planetary magnetosheath observations. We developed new hybrid simulation models to analyze the coalescence of monochromatic mirror mode structure with the filter using fast Fourier transform. In these models, the seeds to grow the waves that we do not need are suppressed in the wavenumber space in each time step. We realized the coalescence of the monochromatic mirror mode waves in the two- and three-dimensional models. We found that the motions of the protons which consists the mountains in the region where the magnetic field is weak play an important role in the coalescence phase. Moreover, the curious ion currents among the mountains of protons are also found.