



3D Magnetic reconnection and Kelvin–Helmholtz instabilities at the Earth’s magnetopause

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We present recent results on 3D magnetic reconnection at play after the development of the Kelvin–Helmholtz instability (KHI) in a collisionless, magnetized plasma. Our study intends to reproduce typical conditions at the flank Earth’s magnetosphere during northward periods where the KH instability is driven by the velocity inhomogeneity at Earth’s magnetopause. The intrinsic 3D dynamics is investigated in a simplified geometry showing that the KHI is able to kink the magnetic field lines at a mid-latitude and to create current layers where magnetic reconnection spontaneously develops. It is shown that at mid-latitude reconnection is able to change the global topology of the magnetic field and to connect interplanetary field lines to the Earth’s cups, allowing the solar wind to directly enter the magnetosphere.

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