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Reconstruction of magnetic reconnection signatures in a compressible plasma

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A Petschek-type model of magnetic reconnection is used to describe the behaviour of nightside flux transfer events (NFTEs). Based on the Cagniard-deHoop method we calculate the magnetic field and plasma flow parameters for a compressible plasma. In order to achieve the reconnection rate from data measured by a satellite, we solve an inverse problem. This we treat with the method of regularisation, since the solution of the Cagniard-deHoop method is given in the form of a convolution integral, which is a well-known problem in the theory of inverse problems. Application of this method for incompressible plasma to Cluster measurements from September 8th, 2002, where a series of Earth-ward propagating 1-minute scale magnetic field and plasma flow variations are observed outside of the plasma sheet, showed good agreement for the z-component of the reconstructed magnetic field. But the x-component of the reconstructed magnetic field was overestimated because of the incompressibility of the plasma. We present first model calculations for the compressible case, where a better agreement between measured and calculated data is found.