# Nonlinear 2D Structures in Heliosphere and Particle Transport

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Nonlinear Alfven waves and related Alfven vortices are studied in the framework of nearly incompressible MHD. These vortices contribute to background 2D turbulence modifying magnetic field and plasma flow in the heliosphere. We study energetic test particle transport in a medium populated with randomly distributed 2D nonlinear structures and estimate corresponding transport coefficients. Particle trapping and acceleration due to turbulent fields are considered. Applications to cosmic ray transport are discussed.