# Nonlinear MHD Wave Propagation in the Magnetosphere

## 이 동 훈

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Dynamics of nonlinear MHD wave propagation is theoretically studied in the magnetosphere. In order to examine the time-dependent propagation of arbitrary initial impulses, we adopt the approach of simple waves, which is often used in ordinary fluids. We obtain an exact solution for the velocity profile in space and time when arbitrary initial perturbations are assumed in a simplified model. These formulae enable us to investigate the characteristics of nonlinear wave propagation and its steepening process while the shock is being formed. We describe how various nonlinear impulses differentially evolve and propagate in time by assuming different timescales for a driving source.