# 内部磁気圏におけるＭＨＤ擾乱の伝搬

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# Propagation of the MHD signals in the inner Magnetosphere

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Behavior of the fast-magnetosonic-mode MHD signals driven by the impulsive, localized current flowing in the east-west direction in the magnetosphere is investigated as the model of the Pi2 signal propagation. The magnetosphere is treated as the axisymmetric cold MHD regime with dipole magnetic fields. The magnetosphere is bounded by the ionosphere, the inner boundary that corresponds to the turning point of the fast-mode wave, and an artificial wave-absorbing layer in the outermost part of the model magnetosphere. The ionosphere is assumed to be a perfect conductor. The plasmaspheric structure of the Alfven speed distribution is also assigned. The MHD perturbation is assumed to be axisymmetric. Therefore, the MHD signal considered here has the azimuthal electric field perturbation and the compressional and poloidal magnetic field perturbations. The numerical calculation reveals the followings:

1) the impulsive current that drives the fast magnetosonic wave induces the transient plasmaspheric resonance oscillation;

2) the compressional magnetic field perturbation is confined near the equator compared with the electric field perturbation. This behavior is almost independent of the field-aligned profile of the source current.;

3) the poloidal magnetic field perturbation at the lower altitudes (near the ionosphere) has the common waveform independent of the L value;

4) the waveform of the compressional magnetic perturbation in the inner plasmasphere (the plasmaspheric resonance oscillation) depends on L-extent of the source current as well as its temporal variation;

5) when the source current is located off the equator, the compressional magnetic pertuebation as well as the poliodal magnetic perturbation appear at the equator. Both perturbations have the different waveforms.