

HTPD 2018



Contribution ID : 387

Type : not specified

6.10 Inverse estimate of the perturbation current density profile of the interchange mode from the magnetic probe measurement in LHD

Tuesday, 17 April 2018 10:31 (120)

In order to evaluate the effect of the MHD instabilities, estimate of the shape the eigenfunction of the MHD mode is necessary. It is not easy to estimate from the magnetic field data measured by the Mirnov coil arrays since the magnetic fluctuation signal is integrated from the perturbation currents inside the plasma. It is a kind of ill-posed inverse problem. However, in the case of the interchange mode where the eigenfunction is quite localized on the rational surface, perturbation current profile perpendicular to the magnetic field line may be estimated from the magnetic fluctuation data. From the numerical test assuming that the current density is localized on the rational surface, the inverse estimate of the current density profile is found to be possible if the suitable regularization method, such as L2-regularization, is used for solving the inverse problem. LHD is a Heliotron type device where net toroidal current is small. Pressure driven mode, such as the interchange mode is the dominant MHD instabilities. Quite deformed waveform, different from the sinewave, are often observed in experiments. Methods for solving the inverse problem and the estimate of the parallel current density profile of complicated MHD phenomena is presented.

Primary author(s) : OHDACHI, Satoshi (National Institute for Fusion Science)

Presenter(s) : OHDACHI, Satoshi (National Institute for Fusion Science)

Session Classification : Session #6, Tuesday Morning Poster Session