Abstract

We present a methodology for generating probabilistic predictions for the *Disturbance Storm Time* (*Dst*) geomagnetic activity index. We focus on the *One Step Ahead* (OSA) prediction task and use the OMNI hourly resolution data to build our models.

Our proposed methodology is based on the technique of *Gaussian Process Regression* (GPR). Within this framework we develop two models; *Gaussian Process Auto-Regressive* (GP-AR) and *Gaussian Process Auto-Regressive with eXogenous inputs* (GP-ARX).

We also propose a criterion to aid model selection with respect to the order of auto-regressive inputs. Finally we test the performance of the GP-AR and GP-ARX models on a set of 63 geomagnetic storms between 1998 and 2006 and illustrate sample predictions with error bars for some of these events.

0.1 Intro

Chutiyapa!