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Interpreting Disruption Prediction Models to Improve Plasma Control[1] MATTHEW PARSONS, University of Illinois at Urbana-Champaign — In order for the tokamak to be a feasible design for a fusion reactor, it is necessary to minimize damage to the machine caused by plasma disruptions. Accurately predicting disruptions is a critical capability for triggering any mitigative actions, and a modest amount of attention has been given to efforts that employ machine learning techniques to make these predictions. By monitoring diagnostic signals during a discharge, such predictive models look for signs that the plasma is about to disrupt. Typically these predictive models are interpreted simply to give a 'yes' or 'no' response as to whether a disruption is approaching. However, it is possible to extract further information from these models to indicate which input signals are more strongly correlated with the plasma approaching a disruption. If highly accurate predictive models can be developed, this information could be used in plasma control schemes to make better decisions about disruption avoidance.

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