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Plasma disruption prediction using machine learning methods: DIII-D[1] L. LUPIN-JIMENEZ, Stanford U., E. KOLEMEN, D. ELDON, PPPL, N. EIDIETIS, General Atomics — Plasma disruption prediction is becoming more important with the development of larger tokamaks, due to the larger amount of thermal and magnetic energy that can be stored. By accurately predicting an impending disruption, the disruptions impact can be mitigated or, better, prevented. Recent approaches to disruption prediction have been through implementation of machine learning methods, which characterize raw and processed diagnostic data to develop accurate prediction models. Using disruption trials from the DIII-D database, the effectiveness of different machine learning methods are characterized. Developed real time disruption prediction approaches are focused on tearing and locking modes. Machine learning methods used include random forests, multilayer perceptrons, and traditional regression analysis. The algorithms are trained with data within short time frames, and whether or not a disruption occurs within the time window after the end of the frame. Initial results from the machine learning algorithms will be presented.

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