

Deep Learning and Machine Learning algorithms for disruption prediction and heat-load monitoring in fusion devices

Barbara Cannas

Motivations

- Mitigate or prevent disruptions in tokamaks (JET)
- Prevent overloads on the first wall in stellarators (W7X)

Results

- Useful tools for dimensionality reduction, visualization and understanding of the high-dimensional plasma parameters space for disruption prediction at JET
- Heat-flux images encoding for heat-load monitoring and control at W7-X

Challenges

- the ability to extrapolate from present devices to full operational regimes.
- extraction of information from unlabeled data

