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Mon-Af-Po1.16-03 [46]: Quench Detection of High-Temperature Superconducting Magnet using Unsupervised Learning Method

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Quench detection of high-temperature superconducting (HTS) magnet is carried out using various signals like voltage, current and temperate from the magnet. Normally, the detection point is set to a fixed value, and when the measured value exceeded detection point, it is detected as a quench. The problem of this method is that the detection system may malfunction in a sequence that the user has not set before or high disturbance situation. In this study, various signals from normal operating state of HTS magnet are learned to the detection system using clustering which is one of the unsupervised learning methods. The learned data are clustered into a set of patterns that are classified through a K-means algorithm. Signals that are over the clustered range are detected as a quench. Quench detection is simulated using MATLAB and is analyzed the results with respect to the learning parameters.

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