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Cluster Scanning

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We propose a new model independent method of new physics searches called cluster scanning (CS). It utilises k-means algorithm to perform clustering in the space of low-level event or jet observables, and separates potentially anomalous clusters to construct the anomaly rich region from the rest that form the anomaly poor region. The spectra of the invariant mass in these two regions are then used to determine whether a resonant signal is present. We apply this approach in a pseudo-analysis using the LHC Olympics R&D dataset and demonstrate the performance gains over the methods based on the global n-parameter function fits commonly used in bump hunting. Emphasis is put on the speed and simplicity of the method

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