Contribution ID: **822** Type: **Poster**

Probing BSM physics with Recursive Jigsaw Reconstruction

Friday, July 6, 2018 8:15 PM (15 minutes)

The recursive jigsaw reconstruction technique provides a powerful way to tackle challenging SUSY final states with multiple missing particles. By altering the input "decay tree" we demonstrate a new approach to considering compressed SUSY signatures from a variety of different sources. The imposition of this decay tree provides a clear way to define which objects are associated with decay states and to partition the visible an invisible objects in a given system. From the imposition of a series of rules, a set of variables emerge, providing a method to distinguish BSM physics cases from the pernicious standard model backgrounds present. These allow sensitivity to signals without having to apply harsh cuts on object momenta or invisible momenta leading to selecting events in unique regions of phase-space.

We introduce this new approach, comparing it briefly to other methods used to probe for BSM physics and demonstrate it's power through application to several final states sensitive to new physics. We will further touch on the applicability of this same method to other physics processes where the use of conventional kinematic handles is challenging.

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Session Classification: POSTER

Track Classification: Beyond the Standard Model