Contribution ID: **115**   Type: **talk**

Progress towards a more sensitive CWoLa hunt with the ATLAS detector

Monday 12 July 2021 15:15 (15 minutes)

As the search for physics beyond the Standard Model widens, 'model-agnostic' searches, which do not assume any particular model of new physics, are increasing in importance. One promising model-agnostic search strategy is Classification Without Labels (CWoLa), in which a classifier is trained to distinguish events in a signal region from similar events in a sideband region, thereby learning about the presence of signal in the signal region. The CWoLa strategy was recently used in a full search for new physics in dijet events from Run-2 ATLAS data; in this search, only the masses of the two jets were used as classifier inputs. It has since been observed that while CWoLa performs well in such low-dimensional use cases, difficulties arise when adding additional jet features as classifier inputs. In this talk, we will describe ongoing work to combat these problems and extend the sensitivity of a CWoLa search by adding new observables to an ongoing analysis using $139 \, \text{fb}^{-1}$ of data from pp collisions at $\sqrt{s} = 13$ TeV in the ATLAS detector. In particular, we will discuss the anticipated benefits of adding classifier features, as well as the implementation of a simulation-assisted version of CWoLa which makes the strategy more robust.

Are you are a member of the APS Division of Particles and Fields?

No

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