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The Search for The W' Boson Through its All-Hadronic Decay[1]
MERRICK LAVINSKY, ALEXANDER KHANOV, Oklahoma State University-Stillwater, ATLAS COLLABORATION — In collaboration with the Oklahoma State University ATLAS group, I have been analyzing new kinematic cuts to purify theoretical W Boson signal. The W is a massive charged gauge boson that is predicted in a plethora of Standard Model Extensions Little Higgs, Kaluza-Klein, Technicolor, and many more. The all-hadronic decay channel for the W leads to the creation of a regular sized bottom-quark-jet (b-candidates) and a large sized top-quark-jet (boosted top). The dominant background for W is Standard Model multijet production; where a significant fraction of b-jets originate from gluon splitting. Such jets have distinct properties that can be used to separate them from single-b-jets produced in W decays. Based on these properties, I developed a novel method that will help to improve the signal-to-background separation in the W search analysis.

[1]NSF

Merrick Lavinsky
Oklahoma State University-Stillwater

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