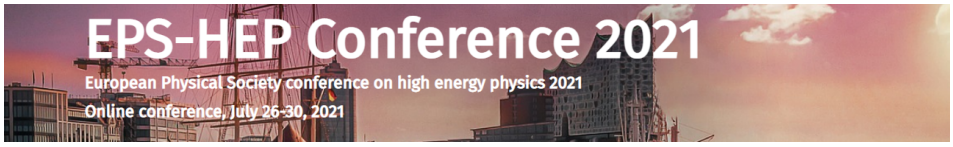

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METNet: A combined missing transverse momentum working point using a neural network with the ATLAS detector

In order to suppress pile-up effects and improve resolution, ATLAS employs a suite of working points for missing transverse momentum ($p_{\mathrm{T}}^{\mathrm{miss}}$) reconstruction, and each is optimal for different event topologies and different beam conditions. A neural network (NN) can exploit various event properties to pick the optimal working point on an event-by-event basis and also allows to combine complementary information from each of the working points. The resulting regressed $p_{\mathrm{T}}^{\mathrm{miss}}$ (METNet) offers improved resolution and pile-up resistance across a number of different topologies compared to the current $p_{\mathrm{T}}^{\mathrm{miss}}$ working points. Additionally, by using the NN's confidence in its predictions, a machine learning-based $p_{\mathrm{T}}^{\mathrm{miss}}$ significance ('METNetSig') can be defined. This poster presents simulation-based studies of the behaviour and performance of METNet and METNetSig for several topologies compared to current ATLAS $p_{\mathrm{T}}^{\mathrm{miss}}$ reconstruction methods.

Collaboration / Activity

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