

Abstract Submitted
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Discovering Unexpected Signals through Background Ranking¹

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The Matrix Element Method (MEM) has become an important tool in experimental particle physics, as it provides optimal sensitivity in using data to distinguish between models that could explain that data. However, it has generally required some concrete model to describe the potential signal. Motivated by the possibility of surprises at the Large Hadron Collider (LHC), we develop MEM-based methods for determining the presence of new physics without assumptions about the signal process responsible for the new physics. One such method, which we believe is especially robust with respect to systematic uncertainties, involves the ranking of events with respect to the value of background matrix element.

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