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Unfolding New Physics with the OmniFold Method WILLIAM MCCORMACK, University of California, Berkeley, BENJAMIN NACHMAN, Lawrence Berkeley National Lab, PATRICK KOMISKE, Massachusetts Institute of Technology — To allow a direct comparison with theoretical predictions, experimentally measured particle physics data must be corrected for detector effects, or "unfolded" (a process often also called deconvolution). The recently introduced OmniFold method uses machine learning to unfold data at particle-level, thereby simultaneously unfolding all variables and accounting for effects that would be neglected using traditional unfolding schemes. Because the OmniFold method uses the full phase space of the data to perform the unfolding, it should naturally allow for the potential presence of Beyond the Standard Model (BSM) physics without concern over potential distortions that the BSM physics might cause in the truth-to-measured response matrix. In this study we examine the power of the OmniFold method to preserve BSM information and the feasibility of performing searches in fully unfolded data. This approach applies to any application of deconvolution in a complex phase space that models detector response with simulation.

William McCormack
University of California, Berkeley

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