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Signal Morphing techniques and possible application to Higgs properties measurements

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One way of describing deviations from the Standard Model is via Effective Field Theories or pseudo-observables, where higher order operators modify the couplings and the kinematics of the interaction of the Standard Model particles. Generating Monte Carlo events for every testable set of parameters for such a theory would require computing resources beyond the ones currently available in ATLAS. Up to now, Matrix-Element based reweighting techniques have been often used to model Beyond Standard Model process starting from Standard Model simulated events. In this talk, we review the advantages and the limitations of morphing techniques to construct continuous probability model for signal parameters, interpolating between a finite number of distributions obtained from the simulation chain. The technique will be exemplified by searching for deviations from the Standard Model predictions in Higgs properties measurements.

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