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Spin and coupling determination of signals with missing energy at the LHC

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Once new heavy particles are discovered at the Large Hadron Collider (LHC), determination of the properties of these particles, such as masses, spins and couplings, is important to distinguish major scenarios of TeV scale new physics. However, new physics processes with missing energy in the final state are challenging to analyze at the LHC since they offer only few kinematical handles. In this talk, I will focus on the spin and coupling determination in production and decay of new heavy particles with missing energy in the final state. This class of processes is analyzed with minimal model assumptions by considering all the possible combinations of spin 0, 1/2 or 1 and couplings for the new particles. Also, a discrete symmetry is assumed to ensure the existence of stable neutral particles, which escape the detector. Some variables will be introduced for the spin and coupling determination. Concrete realizations within several example models such as supersymmetry or universal extra dimension models will be discussed.

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