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Methods for studies of spin, parity, and the tensor couplings of a Higgs boson

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The discovery of the new boson with the mass around 125 GeV at the LHC opens a way for experimental studies of its properties such as spin, parity, and couplings to the Standard Model particles. We present the methods for identifying and measuring various types of tensor couplings that are consistent with assumed symmetries and Lorentz invariance for a given spin assignment. New developments in the measurement strategies are presented, such as production-independent spin tests and study of CP violation in the Higgs couplings. We discuss advances in the Monte Carlo simulation techniques and expectations for the future experimental facilities.

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