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Prospects for a precise measurement of the W mass at LHC with the CMS detector

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After the discovery of the Higgs boson all the parameters of the Standard Model have been measured and therefore it is possible to exploit the predictive power of the theory to set more stringent limits to known observables. A significant deviation of the measured values from the prediction would be an indirect hint of physics beyond the SM. The precision with which the W boson mass is predicted (8 MeV) almost doubles the precision on the world averaged measured value (15 MeV). For this reason, a measurement of the W mass with an accuracy of 10 MeV provides a crucial test of internal consistency of the SM. CMS is planning to deliver a precise measurement of the W mass in the next future. A measurement claiming such a precision is a very challenging one, implying the control of all the observables sensitive to the W mass at levels which are orders of magnitude better than the ones required for other analyses in the same experiment. The experimental and theoretical challenge to perform a measurement with this precision using the large W datasets collected by CMS will be discussed.

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