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## Role of the CMS electromagnetic calorimeter in the measurement of the Higgs boson properties and search for new physics

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The precise determination of the mass, the width and the couplings of the particle discovered in 2012 around 125 GeV is of capital importance to clarify the nature of such a particle, in particular to establish precisely if it is a Standard Higgs boson. In several new physics scenarios, in fact, a Higgs boson may behave differently with respect to the Standard one, or may not be unique, i.e. there can be more than one Higgs boson. In order to achieve the precision needed to discriminate between different models, the energy resolution, the scale uncertainty and the position resolution for electrons and photons are required to be as good as possible. The CMS scintillating lead-tungstate electromagnetic calorimeter (ECAL) was built as a precise tool with an exceptional energy resolution and a very good position resolution that improved over the years with the knowledge of the detector. Moreover, thanks to the fact that most of the lead-tungstate scintillation light is emitted in about 20 ns, ECAL can be used to determine the time of flight of photons, hence giving precious information about the vertex position. In this talk we are going to show the current performance of the CMS ECAL and its evolution over time, with a special emphasis on the impact on the measurement of the properties of the Higgs boson and on searches for new physics.

### Summary

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