Photons to shed light on Higgs

Higgs boson properties using H → γγ final state measured by the CMS experiment

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This seminar presents a summary of Run 2 measurements of Higgs boson properties in the diphoton final state with the CMS detector at the LHC. The analyses use the full proton–proton collision dataset at a center-of-mass energy of 13 TeV. The Higgs boson is reconstructed from two isolated high-energy photons, yielding excellent mass resolution. In particular, the invariant mass spectrum is exploited to extract a precise measurement of the Higgs boson mass, benefiting from improved photon energy scale calibration. In addition, constraints on the Higgs boson width are obtained from the signal lineshape, including the effect of interference with the continuum background. The CP properties are probed using kinematic discriminants sensitive to anomalous couplings. The data are consistent with a CP-even scalar hypothesis within current uncertainties. Overall, these results provide stringent tests of the Standard Model and important input to global combinations of Higgs boson properties.