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## **[366] CMS detector simulation tuning through machine learning**

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The two photon decay channel is among the most sensitive for Higgs physics at the LHC. In particular, it provides the best precision for the measurement of many Higgs boson properties. The ability to interpret LHC data in this channel relies on accurately modeling the detector response to prompt photons. Fine-tuning the particle detector simulation through the exploitation of clean standard candles, such as the dielectron decay of the Z boson, is essential for this goal. We present a method that allows correcting the simulated CMS detector response to isolated prompt photons, differentially in the photon's kinematics and detector occupancy. The method employs machine learning algorithms and dedicated likelihood models to tune the reconstructed cluster shape, and associated isolation sums.

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