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Constraining new physics in the Higgs sector using differential and fiducial cross section measurements from the LHC

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In 2014 ATLAS published a first set of $H \to \gamma\gamma$ and $H \to 4\ell$ differential fiducial cross sections and CMS is finalizing similar results. These measurements are carried out close to the experimental fiducial region and have minimal underlying model dependencies and can be used to constrain beyond the Standard Model physics scenarios coupling to the Higgs sector. Using these published measurements and associated covariances, we characterize possible deviations from the SM with the so-called kappa framework and compare the sensitivity to the official ATLAS results. We then present limits on a range of Spin 2 Higgs impostor scenarios and carry out a reinterpretation of the measured cross sections as production mechanism coupling strengths.

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