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Linearly Polarized Gluons and the Higgs Transverse Momentum Distribution

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We investigate the possible role of linearly polarized gluons in Higgs production from unpolarized pp collisions. The angular independent transverse momentum distribution of the produced Higgs boson is found to exhibit a modulation (max 30%) with respect to the naive, unpolarized expectation, with the sign depending on the CP nature of the Higgs boson. The transverse momentum distribution of a scalar Higgs will, therefore, have a shape clearly different from a pseudo-scalar Higgs. We suggest that this effect can be used to determine the parity of the Higgs at the LHC, without the need to use challenging angular distributions of final state particles.

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