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## Vector boson fusion & associated production of Higgs bosons as an LHC signature of CP violation

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Many well-motivated extensions of the Standard Model predict new, entirely bosonic sources of CP violation (CPV). In these scenarios, the simultaneous observation of carefully selected bosonic processes emerges as a simple yet powerful method to unambiguously reveal the presence of CPV. The present study, which establishes a promising framework of CPV searches for the upcoming HL-LHC era, showcases this method by exploring the detectability of such generic CPV signatures within the economical Complex Two-Higgs Doublet Model (C2HDM). Specifically, we assess the observation prospects for viable combinations of gluon fusion, vector boson fusion and  $V$ -associated production processes which unequivocally signal the existence of CP-violating couplings within the bosonic spectrum of the model.

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