

# Probing the general 2HDM with flavor violation through $A \rightarrow ZH$

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We investigate the LHC discovery prospects for a second Higgs doublet through  $A \rightarrow ZH$  weak decay. The latter is identified as the smoking gun signature of two Higgs doublet models (2HDMs) with first-order electroweak (EW) phase transition, a necessary condition for EW baryogenesis. In the general 2HDM (G2HDM) that has flavor-changing neutral Higgs couplings,  $H$  may decay dominantly via  $t\bar{c} + \bar{t}c$  final states, giving rise to trilepton signals. By a phenomenological analysis, we show that  $A \rightarrow ZH$  in  $\ell^+\ell^-t\bar{c}$  or  $\ell^+\ell^-\bar{t}c$  final states could be a promising probe of G2HDM at the LHC with flavor violation.

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