$\sqrt{s} = 8 \text{ TeV}$ **CMS Preliminary Simulation** 0.7 Signal shapes $X \to HH \to \gamma \gamma b \overline{b}$ $M_x = 300 \text{ GeV}$ $M_x = 500 \text{ GeV}$ 0.6 - $M_{\rm x} = 700 \, {\rm GeV}$ $M_{\rm x} = 1000 \, \text{GeV}$ 0.5 standard model Higgs 0.4 0.3 0.2 0.1 200 110 120 130 140 150 160 170 180

Fraction of events / 2 GeV