Significance on 2 Higgs Doublet Model uu channel, trained network on full 2HDM + a dataset $(m_a, m_H, \tan \beta) = (b20,600,0)$ 10-2 $(m_a, m_H, \tan\beta) = (b1, 1200, 0)$ $(m_a, m_H, \tan\beta) = (b30,600,0)$ $(m_a, m_H, \tan\beta) = (b1, 1000, 0)$ $(m_a, m_H, \tan\beta) = (b10, 1250, 0)$ $(m_a, m_H, \tan\beta) = (b1, 1800, 0)$ Expected significance $[\sigma]$ $(m_a, m_H, \tan\beta) = (b1, 1000, 0)$ $(m_a, m_H, \tan\beta) = (b20, 1250, 0)$ $(m_a, m_H, \tan \beta) = (b1, 1300, 0)$ $(m_a, m_H, \tan\beta) = (b30, 1000, 0)$ 10^{-4} 10^{-5} 0.0 0.2 0.4 8.0 0.6 1.0

XGBoost output