$$t\bar{t} \rightarrow \quad W \quad b \quad H^{\pm} \quad b$$
$$\downarrow \quad \downarrow \quad \hookrightarrow \quad \tau\nu$$
$$e/\mu \quad \mu \quad \hookrightarrow \quad \text{jet}$$

DOMINANT BACKGROUND

- $b\bar{b}$ faking τ
- W+jet faking τ
- $t \rightarrow W \rightarrow \tau$
- top jets faking τ

$\bar{t}t$ SELECTION

- W: isolated e/μ with $p_t > 40$ GeV in $|\eta|<2.0$, 2.4
- b tagging: 2 jets in $|\eta|<2$, $E_t > 40$ GeV each
  nonisolated μ with $p_t > 7–15$ GeV
- $20^\circ < \varphi_{e/\mu-\mu} < 160^\circ$

τ IDENTIFICATION

by single–prong hadronic decay

- jet with $E_t > 10$, 30 GeV ($\Delta R=0.1$) in $|\eta| < 2$
- narrow: E_t ($0.1<\Delta R<0.2$) < 3 GeV
- track $p_t > 30$, 20 GeV (not e/μ) in $\Delta R=0.1$
- isolated: no other $p_t > 5$, 2 GeV in $\Delta R=0.1$, 0.4
- E/p matching: $p_t > E_t - \sigma(E_t)$

FURTHER BACKGROUND REDUCTION

ATLAS, CMS, both