

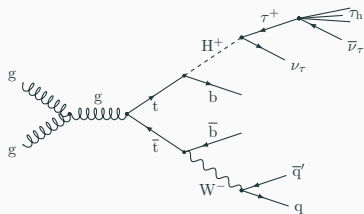
Search for charged Higgs bosons in CMS

Santeri Laurila

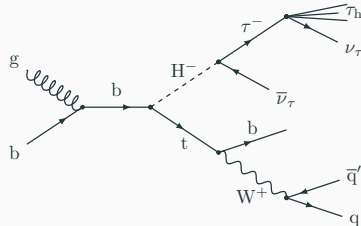
PAP-PAPU-Christmas meeting 12.12.2016



- H(125) constrains but allows a more complex Higgs sector
- Two Higgs doublets $\rightarrow h, H, A, H^+, H^-$
- H^\pm would be a **direct sign of BSM physics!**
- Different production modes, similar **fully hadronic final state**

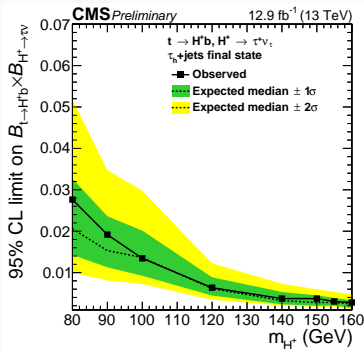


Light

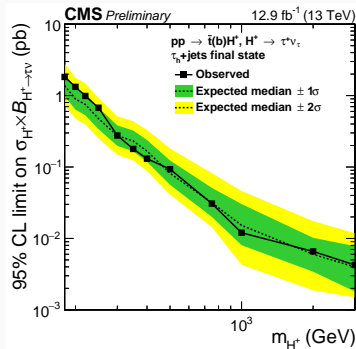


Heavy

First 13 TeV result



Light

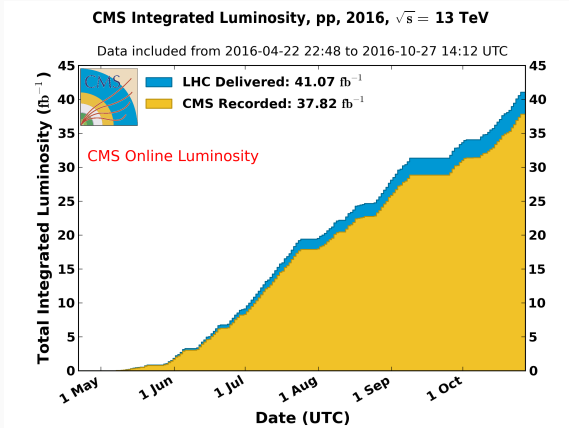


Heavy

First CMS result on 2HDM H^+ at 13 TeV

For details, see [CMS-PAS-HIG-16-031](#)

- Work in progress:
~double the amount of data
- Need to decrease systematic uncertainties with clever analysis methods



- **Tau embedding:** measure tau background from muon events
- $B(W^\pm \rightarrow \mu\nu) \approx B(W^\pm \rightarrow \tau\nu)$ while
 $B(H^\pm \rightarrow \mu\nu) \ll B(H^\pm \rightarrow \tau\nu)$