

Search for an Invisibly Decaying Higgs Boson Produced via Vector Boson Fusion in  $pp$  Collisions at  $\sqrt{s} = 8$  TeV using the ATLAS Detector at the LHC.

Energy: 8 TeV

Luminosity:  $20.3 \text{ fb}^{-1}$

## Invisible Higgs Decay

- Validation has been performed versus the published expected number of signal events for a Higgs boson with a mass of 125 GeV assuming  $\text{BR}(H \rightarrow \text{invisible}) = 1$ .
  - MC samples for the production of a Higgs boson are generated for  $gg \rightarrow H$ ,  $VV \rightarrow H$ , ( $V = W, Z$ ) production channels.
  - The Monte-Carlo generator was POWHEG interfaced with Pythia-6.4.
  - The cross sections have been obtained from the Higgs working group for a Higgs mass of 125 GeV.

Process	ATLAS	CheckMATE
$gg \rightarrow H$	$20 \pm 6$	$24 \pm 6$
$VV \rightarrow H$	$286 \pm 5$	$275 \pm 7$