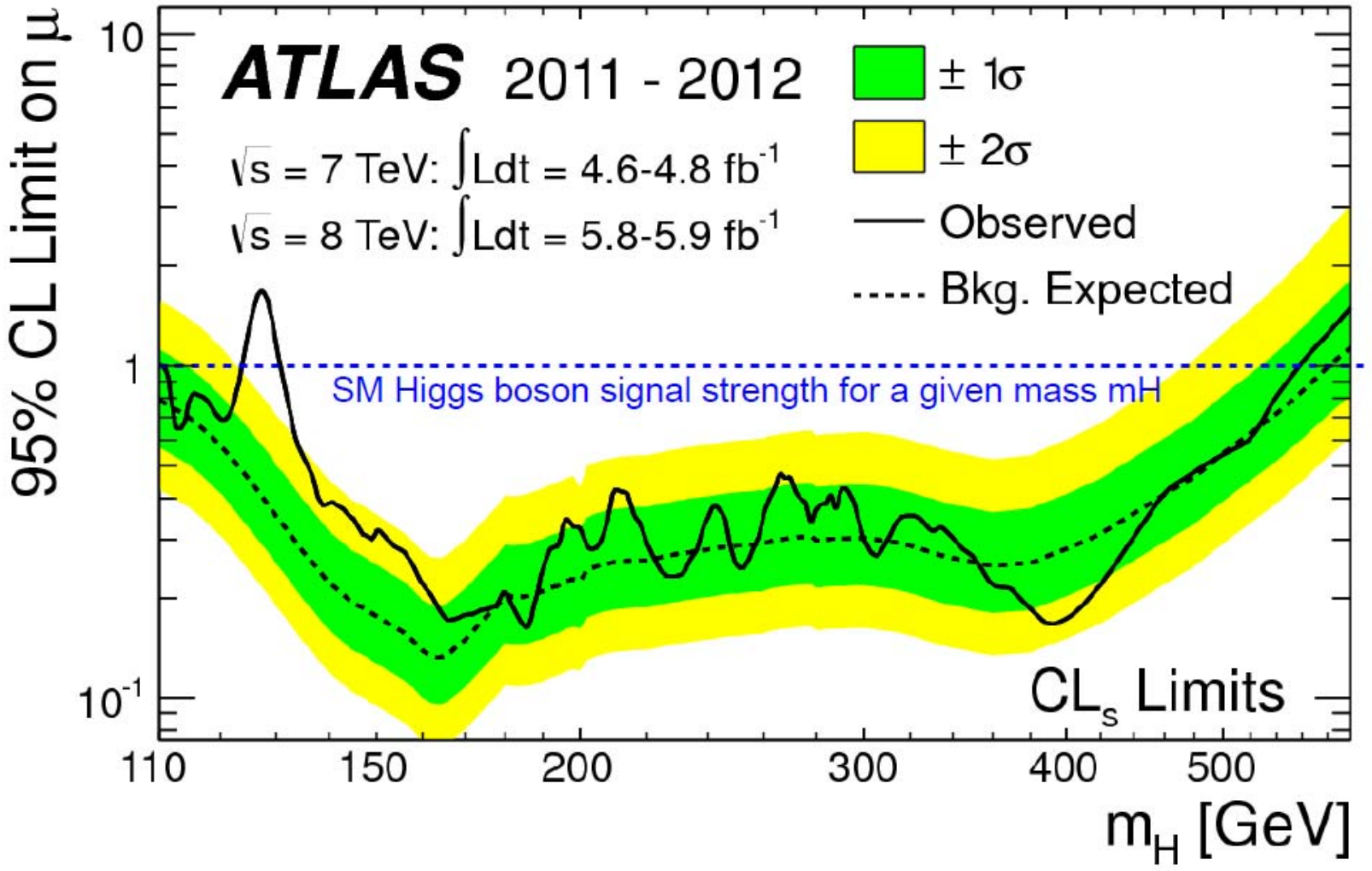
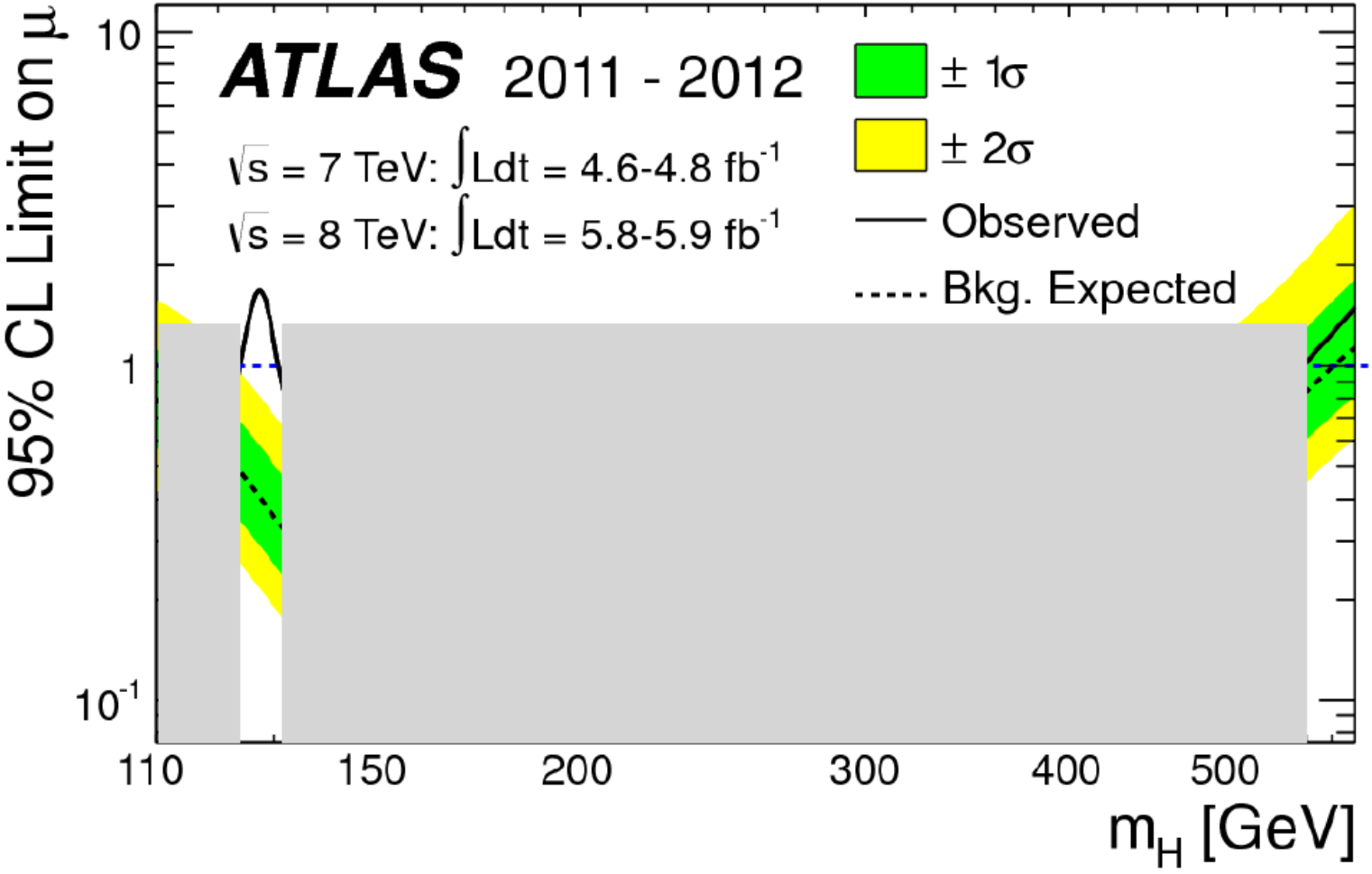
Combined exclusion limits (July 2012)



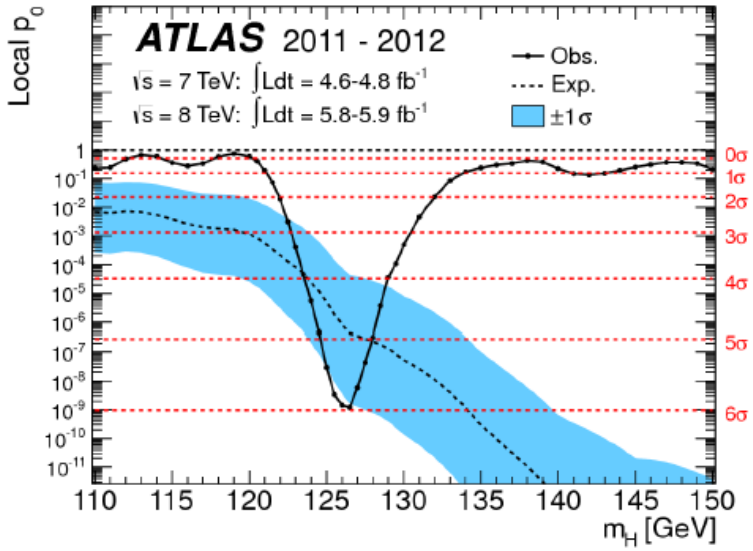
Combined exclusion limits (July 2012)



The existence of the Standard Model Higgs boson is excluded with 95% confidence level for almost all masses m_H from 110 GeV to 600 GeV,
except for $m_H \approx 120$ - 130 GeV where an excess of events is observed in few channels.

Discovery of a Higgs-like particle (July 2012)

Probability that the background fluctuation would give the same or higher excess:



Local significance at 126.5 GeV: 5.9σ

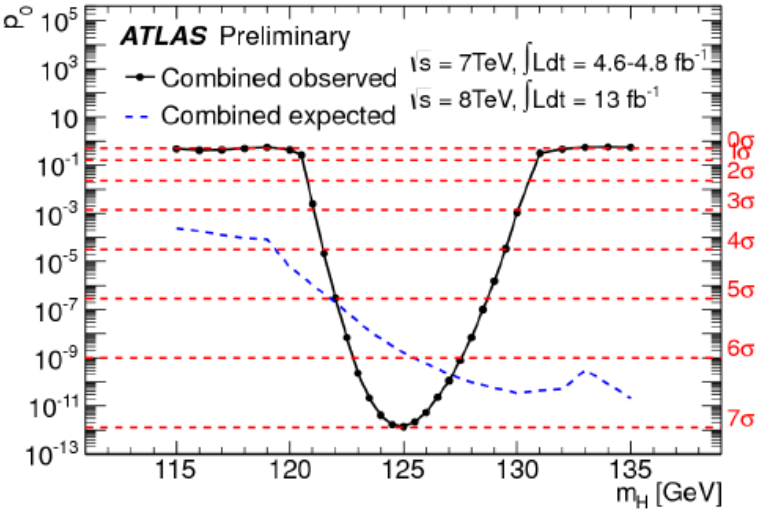
Corresponding expected significance: 4.9σ

Signal significance in individual search channels:

Channel	July 2012
$H \to \gamma\gamma$	4.5σ
$H \to ZZ^{(*)} \to 4\ell$	3.6σ
$H \to WW^{(*)} \to \ell\nu\ell\nu$	2.8σ
$H \to \tau\tau$	no excess
$H \to bb$	no excess

Discovery of a Higgs-like particle (December 2012)

Update with ∼1.8 time more data:



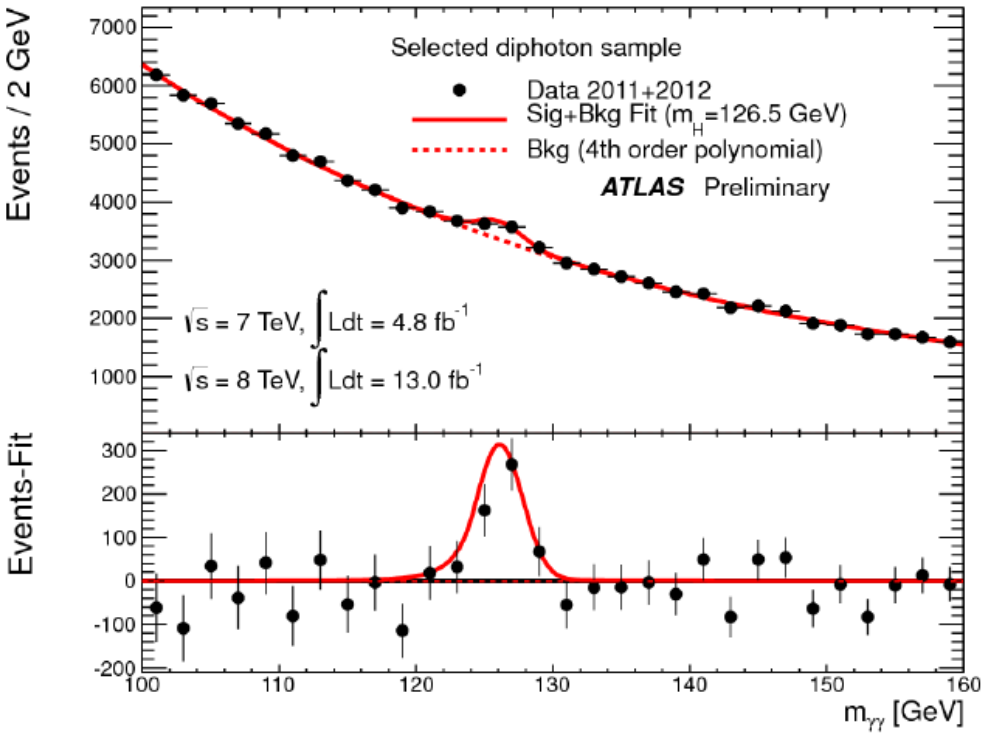
Local significance at 125.2 GeV: 7.0σ

Corresponding expected significance: 5.9σ

Signal significance in individual search channels:

Channel	July 2012	December 2012
$H \to \gamma\gamma$	4.5σ	6.1σ
$H \to ZZ^{(*)} \to 4\ell$	3.6σ	4.1σ
$H \to WW^{(*)} \to \ell\nu\ell\nu$	2.8σ	2.8σ
$H \to \tau\tau$	no excess	1.1σ
$H \to bb$	no excess	no excess

$H \rightarrow \gamma\gamma$



Around $m_{4\ell} \approx 126.6$ GeV: