**Higgs searches:**

- Main Standard Model Higgs decays @125 GeV:
  - \( H \rightarrow \gamma\gamma \): low mass range, high mass resolution;
  - \( H \rightarrow ZZ \): full mass range. Four leptons channel: high purity and mass resolution;
  - \( H \rightarrow WW \): full mass range, small mass resolution, high rate;
  - \( H \rightarrow \tau\tau \): low mass range;
  - \( VH \rightarrow V + \) bb: low mass range, associated production VH, V= Z or W.

**Higgs couplings:**

- Probing different coupling strength scale factors for fermions* and vector bosons [4]:
  - Probing loop structure* \( g g \rightarrow H \) and \( H \rightarrow \gamma\gamma \) (contribution from non-SM particles) [4]:
  - Probing the ratio \( \lambda_{UZ} = \kappa_{W}/k_{Z} \) [4]:

**Signal strength:**

- Signal strength parameter for the individual channels (@125.5 GeV) and for their combination [1]:

**Higgs mass:**

- \( H \rightarrow \gamma\gamma \) and \( H \rightarrow ZZ \rightarrow 4l \) best-fit values of \( m_{H} - \mu \) (with the corresponding 1-2 \( \sigma \) contours) and \( -2 \ln (\lambda(m_{H})) \) as a function of \( m_{H} [1]:

- Combined mass: \( 125.5 \pm 0.2(stat)_{0.3(sys)} GeV \)

**Conclusions:**

- The observation of the Higgs-like particle is fully confirmed on all the most sensitive channels [5];
- First measurements of couplings are consistent with SM expectation.

References:


Andrea Gabrielli (INFN, universita’ di Roma “Sapienza”), for the ATLAS Collaboration