Search for squarks and gluinos with
the ATLAS detector in final states with
jets and transverse missing momentum
using 2015 data

**Introduction**

- Search for the supersymmetric partner of the quarks (squarks) and
the gluons (gluinos).
- Assume that \( R \)-parity is conserved.
- A neutralino is the lightest supersymmetric particle (LSP).
- Their cross-sections are expected to be much larger in proton-proton
  collisions at a centre-of-mass energy of 13 TeV at the LHC in Run2.
- Focus on the final state with \((2\sim6)\) jets & large transverse missing momentum \(E_T^{miss}\).
- Use the 3.2 fb\(^{-1}\) full data recorded by the ATLAS in 2015.

**Event selection**

Prepare 7 kinds of selections to enrich signal by changing selections on jet, \(m_{eff}\) and \(E_T^{miss}\) / \(m_{eff}\).

**Signal region :** \(2jl/2jm/2jt / 4jt / 5j / 6jm/6jt\)

**Standard model background**

- Trigger efficiency and normalization between the Monte Carlo
  process to estimate the difference of

**Control region selection**

- \(Z(\rightarrow \gamma\gamma) + jets\)
- \(W(\rightarrow l\nu) + jets\)
  \(l = e, \mu\)
  Tag lepton (detected)
  Select the mass window of \(m_l - \Delta m\)
  & Veto bottom quark

**Result**

- The observed data and expected background from the
  Monte-Carlo in each signal regions are shown in the figure.
  (Total 28 control regions)

**Interpretation**

The result is interpreted to the limit for three specific classes of the simplified model :