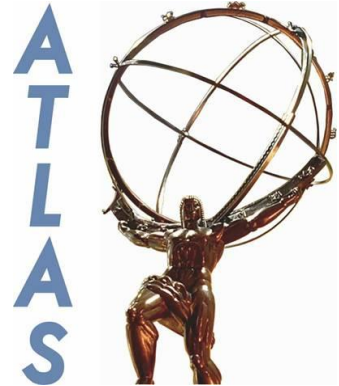


Dark Matter searches with mono-Higgs final states in Run 2 - ATLAS



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Plans for mono-Higgs searches

- With 13 TeV data, plan to use only simplified models of DM production
- Study both s - and t -channel processes
- For s -channel production, plan is to look at mediators of various helicity structures: **scalar, pseudoscalar, vector and axial vector**
 - cross sections expected to be smaller for scalar and axial vector mediators
- Use 3 Higgs decay channels: $h \rightarrow \gamma\gamma$, $h \rightarrow ZZ \rightarrow 4l$, $h \rightarrow bb$
- **Issue: Higgs width**
 - For $m_{\text{DM}} < m_{\text{H}}/2$, Higgs can decay directly to DM, which modifies Γ_{H}
 - In current studies on ATLAS, set Higgs width to *Auto* such that MG5 calculates width
- **Issue: mediator widths:** A common prescription is needed toward Run 2
- **Issue: mediator and DM masses to simulate**
 - $m_{\text{DM}} = 1, 10, 65, 100, 500 \text{ GeV}$? $m_{\text{Med}} = 100, 1000 \text{ GeV}$?