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# ATLAS Full Run 2 Search for Direct Stau Production using Machine Learning

In Supersymmetry, Staus are the proposed super-partner of Standard Model Tau particles and have previously been searched for by the ATLAS and CMS collaborations, so far with no evidence for their existence. However, previous Stau searches in ATLAS have only been able to obtain sensitivity as low as 100 GeV due to the challenging Standard Model backgrounds, resulting in a gap between the ATLAS limits and the limits previously set at LEP of 86 GeV. Models of Supersymmetry with Staus masses in this range are of particular interest as they can yield a dark-matter relic density consistent with cosmological observations. This poster will detail a new ATLAS Stau search which utilises multiple Boosted Decision Trees to improve the sensitivity compared to the first wave search, particularly for these low Stau Mass scenarios. Additionally, the second wave search obtains the first sensitivity to Right-Handed only Stau production at the LHC.

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