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Developments in b-tagging for the ATLAS upgrade and their impact on di-Higgs sensitivity

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The upcoming High Luminosity LHC (HL-LHC) era is expected to bring opportunities for studies involving rare processes, including di-Higgs production. Flavour tagging is going to play a crucial role in the analysis of such processes. This talk will explore the challenges we expect to encounter for flavour tagging in the HL-LHC era, with its higher luminosity, increased pile-up and upgraded ATLAS detector. The focus will be on the expected behaviour of current flavour tagging neural networks (GN2) when trained and evaluated on simulated Run 4 samples. To determine its performance and robustness against the harsher conditions associated with higher pileup. From this we will be able to compare the same model between Run 3 and Run 4 and produce predictions on the impact this new environment will have on di-Higgs analyses.

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