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On the Coverage of the pMSSM by Simplified Model Results

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ATLAS and CMS have performed a large number of searches for physics beyond the Standard Model (BSM). The results of SUSY searches are typically interpreted in the context of Simplified Models. While mass limits obtained in this manner are highly model dependent, cross section upper limits (or efficiency maps) may be used to obtain constraints on generic BSM scenarios without any further event and detector simulation. This procedure has been automatised in the public tool SModelS, which first decomposes the generic scenario into Simplified Model components that can then be tested directly against the results in the SModelS database. I will briefly introduce SModelS and then discuss how the coverage by Simplified Model results compares to what can be obtained in a full simulation study for the example of the 19 parameter phenomenological MSSM (pMSSM). Considering all parameter points that ATLAS has tested in a comprehensive study (see arXiv:1508.06608), we find that about 50% of the points excluded by ATLAS can be excluded from Simplified Model constraints. This fraction could be improved by considering currently 'missing' Simplified Model topologies and I will show examples of parameter space regions where the coverage is significantly improved if we add Simplified Model topologies not considered by the experiments. Finally we characterise scenarios that do not map onto Simplified Model components.

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