

WG3 Benchmark “Prioritization” Discussion

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LHC HXSWG General Meeting

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- The list of available benchmark models in WG3 is quite extensive, for example:

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWG3Benchmarks2HDM>

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWGGM>

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWG3BenchmarksNon2HDM>

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWGMSMNeutral#Available%20benchmark%20scenarios>

<https://arxiv.org/abs/1808.07542>

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/NMSSMBenchmarkPoints>

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWGExoticDecay#Benchmark%20models>

<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCHXSWG3Flavorful2HDM>

- The experiments are already searching for many of these signatures, however there are also many that are not yet covered.
- Unfortunately its not easy to initiate so many brand new analysis efforts within the experiments.
- Of course we should aim for full coverage of all possible signatures, but person power is a finite resource and an analysis takes a significant amount of time.
- So the proposal for discussion is to hear people's opinions on the (partly hypothetical) questions:
 - If we could initiate only one new analysis effort in the experiments, which one do you think it should be and why?
 - What are the experimental challenges for that search? Did we trigger on it already or not?

- The point of this thought exercise is to stimulate interesting discussions (hopefully not everyone would have the same answer)
- This is no way will lead to an endorsement of any sort by WG3 of a particular benchmark. These will be purely opinions.
- Hopefully this will lead into scientific discussion about the theoretical merits and experimental cost/benefits of the many benchmarks and signatures that we have.