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Towards a Herwig dark shower and hadronisation module

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If dark mesons exist, their evolution and hadronization procedure are currently little constrained. They could decay promptly and result in a very SM QCD like jet structure, even though the original decaying particles are dark sector ones; they could behave as semi-visible jets; or they could behave as completely detector-stable hadrons, in which case the final state is just the missing transverse momentum. Apart from the last case, which is more like a conventional BSM MET signature, the modelling of these scenarios is somewhat an unexplored area, other than the range of phenomenological predictions as implemented in Pythia8's HV module. In this talk I will cover the proposed idea of having a Herwig hidden valley dark shower and hadronisation module, as part of my MCnet short term studentship, and the prospect of using jet substructure methods for designing observable/s to distinguish between dark jets, semi-visible jets and light q/g jets, by comparing different observables in a IRC-safe linear basis.

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