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Complementarity of direct detection and collider searches for Higgs portal DM

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In this talk, I will describe complementarity of direct detection and collider searches for Higgs portal DM models, and show that it is essential to work in renormalizable and gauge invariant DM models for collider searches (both the invisible Higgs decay and the monojet (or dijet) + missing ET). In particular we derive the bounds on new physics scale within a UV model, and show that it is completely different from those presented by ATLAS and CMS Collaborations based on simple mediator models.

Refs:
(1) arXiv:1405.3530 (Phys.Rev. D90 (2014) 5, 055014)
(2) arXiv:1506.06556, and works in preparation

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