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Complementarity in Dark Matter Searches (12'+3')

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I will report on recent research activities conducted at Chalmers in the field of dark matter particle phenomenology. The dark matter particle phenomenology group at Chalmers performs research on the complementarity of different dark matter search strategies in order to maximise the amount of information which can be extracted from the outcome of present and future dark matter search experiments. For example, our group has shown that the hypothetical discovery of dark matter in one of the upcoming runs of direct detection experiments such as XENONnT or LZ could be combined with the collider searches for dark matter to gain insights into the dark matter particle spin. Of particular interest in this area are monojet and dijet searches at the Run 3 of the LHC. We study their phenomenology in the framework of simplified models, and use non-relativistic effective operators as far as the modelling of direct detection signals is concerned. We are also interested in the combined interpretation of dark matter searches at direct detection experiments and neutrino telescopes. We pursue our research benefiting from interactions with the Chalmers' Nuclear Theory and Particle Phenomenology groups. Furthermore, we collaborate with the XENON group in Stockholm within the SweDCube network, and with other experiments in astroparticle physics, including IceCube and CRESST.

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