



DESY THEORY WORKSHOP  
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**Particle Cosmology  
after Planck**

DESY Hamburg, Germany



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## Testing Effective Interactions of Dark Matter at Colliders and Direct Detection Experiments

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We discuss effective operators describing interactions between dark matter and Standard Model particles. We are particularly interested in higher-dimensional operators, since they are typically suppressed compared to the leading order effective operators. This can explain why no conclusive direct dark matter detection has been made so far. The ultraviolet completions of the effective operators, which we systematically study, require new particles, which can have masses at the TeV scale and are therefore phenomenologically interesting for LHC physics. We investigate possible tree-level completions with extra fermions and scalars, and we discuss the LHC phenomenology of a specific example with extra heavy fermion doublets in the context of the so-called Higgs-portal.

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