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Cosmological constraints on multi-interacting dark matter

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Despite its remarkable success, the standard Λ CDM paradigm has been challenged lately by significant tensions between different datasets. This has boosted interest in non-minimal dark sectors, which are theoretically well-motivated and inspire new search strategies for DM. With this in mind, we have developed a new and efficient version of the Boltzmann code CLASS that allows for one DM species to have multiple interactions with photons, baryons, and dark radiation simultaneously. In this talk I will present our new results obtained using this framework, where we have reassessed existing cosmological bounds on the various interaction coefficients in multi-interacting DM scenarios, as well as investigating the possibility of these models to alleviate the cosmological tensions. The upcoming public release of our code will pave the way for the study of various rich dark sectors.

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