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A fresh look at linear cosmological constraints on a decaying dark matter component

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It is well known that CMB is a very powerful tool to constraints Dark Matter decays, even if this decay happens in some invisible -so called "dark"- radiation.
I would like to show that, in multi-component models, or more generally for non-trivial dark sector decoupled from standard model, CMB can constraints both lifetime and abundance of decaying dark matter into dark radiation (that could be played by neutrinos). Interestingly, in the context of gravitationnal waves detections, these bounds also apply to merging primordial black holes, often invoked as possible dark matter candidates. Finally, it has been claimed that recent tensions between low redshift astronomical dataset and CMB power spectra could be solved by such models. With the most accurate treatment to this day, I will show that DM decay into relativistic dark radiation with no special interacting properties can at most help in loosening these tensions, but not totally solve it. This talk is based on arXiv:1606.02073.

Summary

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