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Soft Dark Energy and Soft Dark Matter

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Standard cosmology is based on the assumption that the dark fluids behave as standard, hard matter.
On the other hand, soft matter is a well studied field in condensed matter physics. We investigate the possibility of soft cosmology", namely the appearance (intrinsically or effectively) of soft-matter properties in the dark sectors. We propose a novel parametrization introducing thesoftness parameters", which quantify the scale dependence of the dark sector's EoS, i.e the difference between large and intermediate scales. Although the background evolution remains unaffected, even a slightly non-trivial softness parameter improves the clustering behavior and alleviates e.g. the $f\sigma_8$ tension. Soft dark energy and soft dark matter seem to be favoured by the data comparing to LambdaCDM scenario.

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