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Acoustic Dark Energy: Potential Conversion of the Hubble Tension

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We discuss the ability of a dark fluid becoming relevant around the time of matter radiation equality to significantly relieve the tension between local measurements of the Hubble constant and CMB inference, within the ΛCDM model.
We show the gravitational impact of acoustic oscillations in the dark fluid balance the effects on the CMB and result in an improved fit to CMB measurements themselves while simultaneously raising the Hubble constant.
The required balance favors a model where the fluid is a scalar field that converts its potential to kinetic energy around matter radiation equality which then quickly redshifts away.
We derive the requirements on the potential for this conversion mechanism and find that a simple canonical scalar with two free parameters for its local slope and amplitude robustly improves the fit to the combined data by $\Delta\chi^2 \approx 12.7$ over ΛCDM.
We uncover the CMB polarization signatures that can definitively test this scenario with future data.

Author: Mr LIN, Meng-Xiang (University of Chicago)

Co-authors: Prof. HU, Wayne (University of Chicago); Dr RAVERI, Marco (University of Chicago); Mr BENEVENTO, Giampaolo (Universit\'a degli Studi di Padova)

Presenter: Mr LIN, Meng-Xiang (University of Chicago)

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