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Double Monodromy Inflation: A Gravity Waves Factory for CMB-S4, LiteBIRD and LISA

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We consider a short rollercoaster cosmology based on two stages of monodromy inflation separated by a stage of matter domination, generated after the early inflaton falls out of slow roll. If the first stage is controlled by a flat potential, $V \sim \phi^p$ with $p < 1$ and lasts $\mathcal{N} \sim 30\text{--}40$ e-folds, the scalar and tensor perturbations at the largest scales will fit the CMB perfectly, and produce relic gravity waves with $0.02 \leq r \leq 0.06$, which can be tested by LiteBIRD and CMB-S4 experiments. If in addition the first inflaton is strongly coupled to a hidden sector $U(1)$, there will be an enhanced production of vector fluctuations near the end of the first stage of inflation. These modes convert rapidly to tensors during the short epoch of matter domination, and then get pushed to superhorizon scales by the second stage of inflation, lasting another 20–30 e-folds. This band of gravity waves is chiral, arrives today with wavelengths in the range of 108 km, and with amplitudes greatly enhanced compared to the long wavelength CMB modes by vector sources. It is therefore accessible to LISA. Thus our model presents a rare early universe theory predicting several simultaneous signals testable by a broad range of gravity wave searches in the very near future.

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Maybe

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