

## **CMB Anomalies in the Light of BICEP2**

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We relate CMB anomalies and the recent discovery of primordial gravitational waves. Two aspects are investigated:

(a) Several anomalies are spotted on the low  $l$  temperature map of the WMAP and Planck experiments. However, those anomalies disappear at high  $l$ . We propose that those low  $l$  temperature anomalies may come from nearly scale invariant anomalies of the tensor sector. Those anomalies on the temperature map naturally decay towards small scales, characterized by the tensor-to-temperature radiation transfer function.

(b) The anomalies introduced by the gravitational waves discovery. Strong tension is noticed between the BICEP2 and Planck data. We study in detail how blue tilt of the tensor spectrum reconciles the tension between those datasets.

References:

- [1] Y.-Z. Ma and YW, arXiv: 1403.4585
- [2] YW and W. Xue, arXiv: 1403.5817
- [3] X. Chen, R. Emami, H. Firouzjahi and YW, 1404.4083
- [4] R. Emami, H. Firouzjahi and YW, 1404.5112
- [5] On going works in collaboration with Y.-F. Cai and with Y.-Z. Ma.