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Detecting and distinguishing topological defects in future data from the CMBPol satellite

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The proposed CMBPol mission will be able to detect the imprint of topological defects on the cosmic microwave background (CMB) provided the contribution is sufficiently strong. We quantify the detection threshold for cosmic strings and for textures, and analyse the satellite's ability to distinguish between these different types of defects. We also assess the level of danger of misidentification of a defect signature as from the wrong defect type or as an effect of primordial gravitational waves. A 0.002 fractional contribution of cosmic strings to the CMB temperature spectrum at multipole ten, and similarly a 0.001 fractional contribution of textures, can be detected and correctly identified at the 3σ level. We also confirm that a tensor contribution of $r = 0.0018$ can be detected at over 3σ , in agreement with the CMBpol mission concept study. These results are supported by a model selection analysis.

Comments: New version has slightly reworded section III, 10 pages, 6 figures

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