



Contribution ID: 7

Type: **not specified**

Foregrounds with SPIDER: Examining Deviations in Dust Modeling

Thursday, 21 September 2023 12:00 (30 minutes)

SPIDER is a balloon-borne CMB polarimeter that has measured 4.8% of the sky with degree-scale angular resolution. Launching from McMurdo, Antarctica, we benefit from the high altitude and long flights achievable from NASA's Long Duration Balloon facility, which provides access to space-like observing conditions. Using the data from our first flight in 2015, SPIDER published a constraint on primordial B-modes based on complementary foreground removal techniques: map-based template subtraction; and harmonic-based fitting assuming a modified-blackbody dust model. In this talk, we explore a number of modeling assumptions involved in the spatial and spectral tools developed for the B-mode analysis. After a brief review of the SPIDER experiment and B-mode results, we present preliminary results on the spatial variation of the template-fitting parameter and on the validity of the modified-blackbody dust model. We also present preliminary in-flight performance results from the second flight of SPIDER, which observed the SPIDER region at 95, 150, and 280 GHz. The first-of-their-kind 280 GHz data will help SPIDER and the CMB community better understand dust emission and perform more robust searches for primordial B-modes.

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Session Classification: CMB