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A New Limit on CMB Circular Polarization from SPIDER

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I will present a new upper limit on CMB circular polarization from the 2015 flight of SPIDER, a balloon-borne telescope designed to search for B-mode linear polarization from cosmic inflation. Although the level of circular polarization in the CMB is predicted to be very small, experimental limits provide a valuable test of the underlying models. By exploiting the non-zero circular-to-linear polarization coupling of the half-wave plate polarization modulators, data from SPIDER's 2015 Antarctic flight provides a constraint on Stokes V at 95 and 150 GHz from $33 < l < 307$. No other limits exist over this full range of angular scales, and SPIDER improves upon the previous limit by several orders of magnitude. As linear CMB polarization experiments become increasingly sensitive, similar techniques can be applied to obtain even stronger constraints on circular polarization.

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