

The ACTPol and Advanced ACTPol Instruments

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Abstract— The Atacama Cosmology Telescope Polarization instrument (ACTPol) and its successor Advanced ACTPol (AdvACT) are millimetre wave polarimeters optimized for measurement of the Cosmic Microwave Background (CMB). These instruments incorporate several novel technologies including: metamaterial antireflection coated silicon lenses; continuously rotating metamaterial silicon half wave plates; and multichroic horn coupled polarimeter arrays. These technologies are designed in concert to accommodate operation over wide bandwidth with high efficiency and excellent control over systematic effects. In these proceedings we review the scientific goals of these projects, describe these technologies, and present a preliminary look at the on sky performance of the first deployed multichroic CMB polarimeter.

I. INTRODUCTION

To be completed before the conference.

II. INSTRUMENT DESCRIPTION

A. Multichroic Detector Arrays

B. Metamaterial Antireflection Coated Silicon Lenses

C. Metamaterial Silicon Half-Wave Plates

D. Broad-Band Window

III. ON SKY PERFORMANCE

IV. CONCLUSIONS

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