Abstract Submitted
for the SES06 Meeting of
The American Physical Society

Probing the Universe on the Largest Possible Scales with Remote Cosmic Microwave Background Quadrupole Observations[1] EMORY BUNN, University of Richmond — Observations of cosmic microwave background (CMB) anisotropy suggest the possibility that the Universe is not statistically isotropic — that is, that it has a preferred direction — but the statistical significance of these claims is controversial. To settle the question we need an independent data set probing the same physical scales. Scattering of CMB radiation in galaxy clusters may provide the information we need: it produces a polarization signal proportional to the CMB quadrupole anisotropy at the cluster's location and look- back time, thus probing ultra-large-scale perturbations. I will present calculations of the number of independent modes that can be obtained from such a "remote quadrupole" survey, along with the length scales probed by these modes. In a sparse survey of a large area of sky, the largest-scale modes probe length scales comparable to the large-angle CMB anisotropy but with much narrower Fourier-space window functions. The formalism presented here is also useful for analyzing smaller-scale surveys to probe the late integrated Sachs-Wolfe effect and hence the properties of dark energy.

[1]Supported by NSF Grants 0233969 and 0507395

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Date submitted: 15 Aug 2006 Electronic form version 1.4