OSSE SKY SURVEY OBSERVATIONS FOR CYCLES

THREE EXTREME RED EGRET BLAZARS

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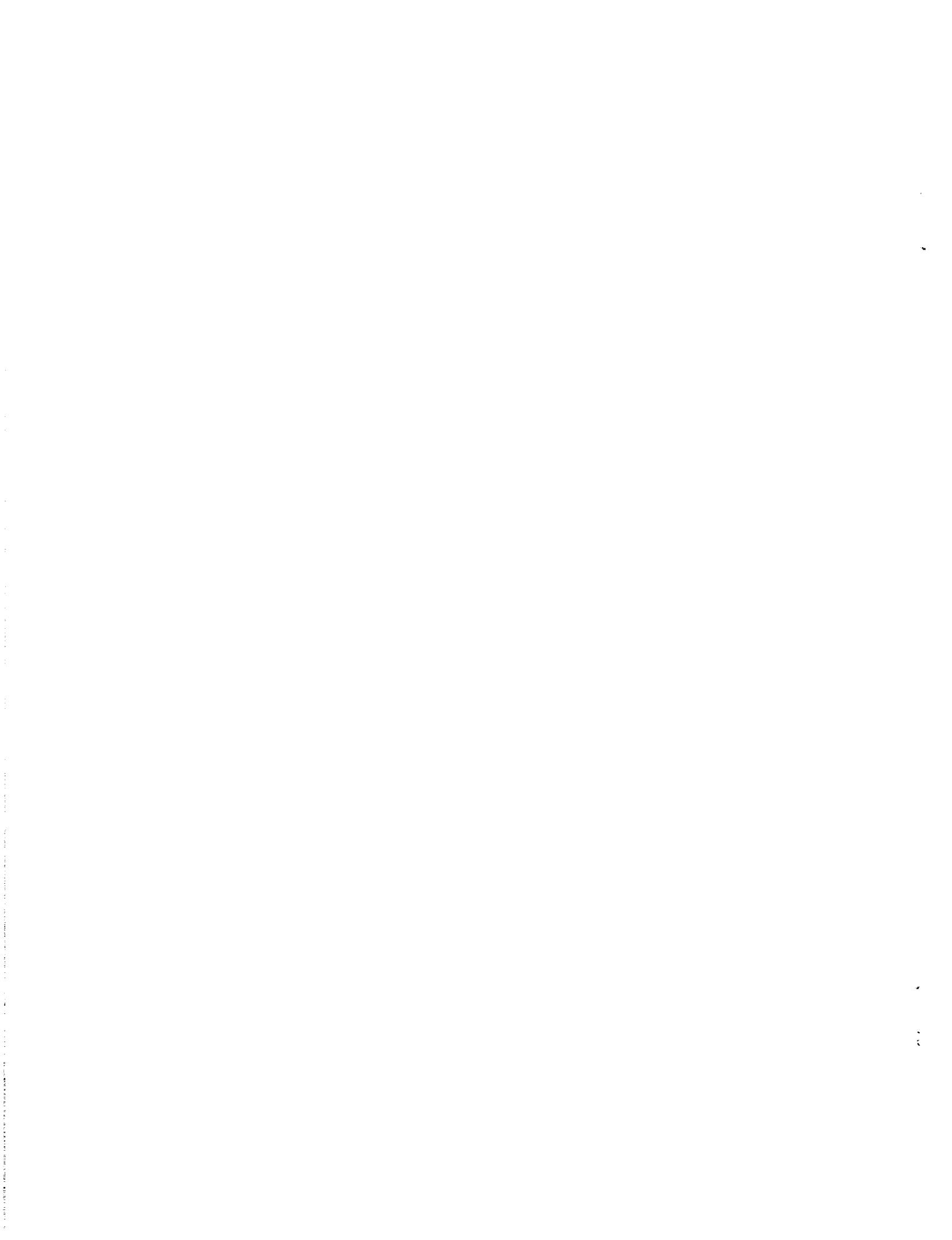Dr. Jonathan F. Schachter

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1 Introduction

The original purpose of this work was to probe EGRET sources of low significance, and to use statistical techniques to construct a $logN - logS$ of sources at > 50MeV. At this writing, the detection significance of EGRET sources is still an issue. Therefore, we shifted our focus to the known EGRET detections. These came in two groups: (a) the known blazars; and (b) the high–Galactic latitude EGRET sources not identified with optical (or radio) counterparts.

2 Results

We confirmed that the L_X/L_γ correlation found by Salamon and Stecker (1994; using a heterogeneous sample of EGRET blazars, many without known redshift) also holds for a radio–flux limited sample of EGRET blazars, all with known redshifts. We have ruled out any sample–wide correlations between EGRET flux and either (1) core radio flux, from VLBI observations; or (2) radio core dominance ($f_{core}/f_{extended}$). There is also no clear trend of gamma–ray spectral index with redshift.

We developed 2 new techniques to search for bright blazars among the high–latitude EGRET sources unidentified with optical counterparts in published catalogs. The first technique (Mattox et al. 1997) involved using the Bayesian maximum–likelihood method on a cross–correlation between both southern and northern flux–limited radio surveys, an extension of a method previously applied to X–ray (Schachter et al. 1998) and radio sources. Criteria were high likelihood, and flat spectrum (when spectral index information was available).

The second technique (Iler et al. 1997) used radio polarization, taken from the new VLA 1.4 GHz all–sky survey, NVSS. We found that with a polarization percentage at 1.4 GHz of 1%, and also with the flat–spectrum criterion, we could confirm many existing EGRET identifications. We also found 4 additional blazar candidates.

3 Future Work

We are extending our radio polarization method to southern fields observed at the Australia Telescope National Facility (ATNF) array, and to northern COMPTEL fields using the NVSS. We expect to do optical identification of the 4 new blazar candidates.

4 References

*Radio Polarization in EGRET Blazars (A. Iler, J.F. Schachter , and M. Birkinshaw), 1997, *Ap.J.*, 486, 117

*On the Identification of EGRET Sources with Radio Sources, (J. R. Mattox, J. Schachter, R. C. Hartman, L. Molnar, and A. R. Patnaik), 1997, *Ap.J.*, 481, 95

The blazar gamma-ray luminosity function and the diffuse extragalactic gamma-ray background, (M. H. Salamon, F. W. Stecker), 1994, *Ap.J. (Letters)*, 430, 21

The Second Einstein Slew Survey Catalog, (Schachter, J. et al.), 1998, in preparation

NOTE–A "*" indicates that this publication came directly out of the work we describe here.