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CGRO COMPTEL Observations of AGNs

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presented from each of the observational programs. The aim is to view the AGN phenomenon and, especially blazars, as a whole, using novel observational methods to look for similarities and differences between distinct classes of objects.

The visible spectropolarimetric characteristics of 3C273, 3C345 and CTA102 will be discussed in detail. Observations at 8A resolution with the 4.2m William Herschel Telescope are contrasted with existing knowledge from broad band photopolarimetry of these objects. It is found that the data is in broad agreement with the predictions of synchrotron theory, but numerous problems remain. Very contrasting behavior is seen in the polarization of the spectral lines in each object and, in 3C345 it is even found that different spectral lines within the same spectrum show sharply different polarization characteristics. Observations of LPQs show that at least 50% have detectable polarization, generally of 0.5-1%. The observations suggest that there are similarities between LPQs and blazars, with good evidence of variable polarization in a number of objects. Our initial sample of objects shows that almost all LPQs with detectable polarization are Radio Quiet and/or x-ray loud. Extensive fast photometry has been performed of a number of objects, especially OJ287 (visible and infrared), Mark421 and Mark501 (infrared). Rapid variability is found to be common, whilst simultaneous UBVRIJK observations show that fast spectral variability on time scales of an hour or less also occurs with some frequency; this last has major implications for models of the active nucleus.

21.03

CGRO COMPTEL Observations of AGNs

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During its first year of operation, the imaging Compton telescope COMPTEL aboard the Compton Gamma Ray Observatory has searched the sky for medium-energy gamma-ray emission (0.7 to 30 MeV) from AGNs and quasars. We report on the detections of the quasars 3C273 and 3C279, PKS 0528+134, and the radio galaxy Cen A. Skymaps and preliminary spectra for these objects will be presented. Evidence for spectral breaks and possible time variability in the high-energy emission from these sources will be discussed. A brief status report on the search for medium-energy gamma radiation from other gamma-ray AGNs discovered by the high-energy EGRET experiment aboard the CGRO will also be presented.

21.04

Searches for High Energy Gamma Rays from Active Galactic Nuclei with EGRET

D. J. Thompson, D. L. Bertsch, C. E. Fichtel, R. C. Hartman, S. D. Hunter (NASA/GSFC), G. Kanbach, H. A. Mayer-Hasselwander, C. von Montigny, K. Pinkau, (MPE), Y. C. Lin, P. F. Michelson, P. L. Nolan (Stanford), D. A. Kniffen (Hampden-Sydney College), E. Schneid (Grumman), B. L. Dingus, P. Sreekumar (USRA/GSFC), P. W. Kwok (NRC/GSFC), J. R. Mattox (CSC/GSFC)

In addition to the 16 active galactic nuclei (AGN) which have been detected above energies of 100 MeV by the Energetic Gamma Ray Experiment Telescope (EGRET) on the Compton Observatory, several other possible detections have been made with somewhat lower statistical significance. These sources share many of the characteristics of the high-confidence AGN detections.

21.05

Unidentified High Energy Gamma Ray Sources Detected by EGRET at High Galactic Latitudes

R.C. Hartman, D.L. Bertsch, C.E. Fichtel, S.D. Hunter, D.J. Thompson (NASA/GSFC), G. Kanbach, H.A. Mayer-Hasselwander, C.v.Montigny, K. Pinkau (MPE), D.A. Kniffen (Hampden-Sydney), Y.C. Lin, P.F. Michelson, P.L. Nolan (Stanford), J.R. Mattox (GSFC/CSC), B.G. Piner (Univ. Maryland), E. Schneid (Gruman), P. Sreekumar (GSFC/USRA), B.L. Dingus (GSFC/NRC)

In addition to the 16 announced EGRET detections of gamma ray emission from active galactic nuclei (AGN's), a number of high latitude sources have been detected by EGRET for which no compelling identification has been made. The statistical significance of these detections is high, although none of the fluxes have been observed to be as high as the brightest identified objects. Two have been observed to undergo substantial time variations of high statistical significance. The positions and properties of these sources will be presented, as well as possible identifications.

21.06

OSSE Observations of Active Galactic Nuclei

W.N. Johnson, R.L. Kinzer, R.A. Kroeger, J.D. Kurfess, M.S. Strickman (Naval Research Lab), R.A. Cameron, G. V. Jung (USRA), D.A. Grabelsky, W.R. Purcell, M.P. Ulmer (Northwestern Univ.)

The OSSE instrument on the *Compton* Gamma Ray Observatory (GRO) has observed over thirty Active Galactic Nuclei during the sky survey of the first eighteen months of operation. The observations were mainly of Seyfert objects selected on the basis of previous measurements of X-ray emissions. Four QSOs were also observed. These observations resulted in detections of approximately half of these objects above the OSSE threshold energy of 0.06 MeV. The spectral and temporal characteristics of these detections and their implications shall be discussed.

21.07

Detection of TeV Photons from Markarian 421

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Gamma-rays of energies > 0.5 TeV have been observed from the BL Lac galaxy Markarian 421 using the Whipple Observatory imaging gamma-ray telescope. The average flux of 1.5×10^{-11} photons $\text{cm}^{-2} \text{s}^{-1}$ is 0.3 times that of the Crab Nebula and represents a 6σ excess over background. The observations were performed in March-June 1992. Mk421 (redshift $z=0.031$) is one of 16 galaxies seen at MeV-GeV energies by the EGRET detector aboard the Compton Observatory. We will report on observations of other active galaxies and quasars which are brighter than Mk421 at EGRET energies. These observations are consistent with suggestions that TeV photons are absorbed by infrared background radiation.