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Gamma-Ray Observations of Active Galactic Nuclei: From GRO to GLAST

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Some fraction of accreting black holes generate powerful collimated relativistic outflows; when these jets are pointed towards us, such Active Galactic Nuclei are known as blazars. Particles in blazar jets radiate in two broad peaks: by synchrotron radiation in the radio to soft X-ray band, and by photons boosted by inverse Compton processes at hard X-ray and gamma-ray energies. Formation of these powerful jets (with bulk Lorentz factor 10) and the acceleration of particles in the jets (to electron Lorentz factors up to 10⁶) are not understood - especially since the formation region is too compact to be directly imaged. Our best hope for understanding the jet structure is through multiwavelength variability studies. The upcoming launch of the Gamma-ray Large Area Space Telescope (GLAST), together with current and future X-ray and hard X-ray observatories promise dramatic improvements in data quality. I will review the current observational status, and discuss the advances in understanding we expect from these new capabilities.