ACCELERATION EFFICIENCY IN NONTHERMAL SOURCES AND THE SOFT GAMMA-RAYS FROM NGC 4151 OBSERVED BY OSSE AND SIGMA

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1. ABSTRACT

We show that the recent observations of the Seyfert galaxy NGC 4151 in hard X-rays and soft γ-rays by the OSSE and SIGMA detectors onboard *CGRO* and *GRANAT*, respectively, are well explained by a nonthermal model with acceleration of relativistic electrons at an efficiency of $\lesssim 50\%$ and with the remaining power dissipated thermally in the source (the standard nonthermal $e^{\pm}$ pair model assumed 100% efficiency). Such an acceleration efficiency is generally expected on physical grounds. The resulting model unifies previously proposed purely thermal and purely nonthermal models. The pure nonthermal model for NGC 4151 appears to be ruled out. The pure thermal model gives a worse fit to the data than our hybrid nonthermal/thermal model. Our results are presented in Zdziarski, Lightman, & Maciołek-Niedźwiecki (1993).

References

Zdziarski, A. A., Lightman, A. P., & Maciołek-Niedźwiecki, A. 1993, *ApJLetters*, 414, L93

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