Chandra discovery of large scale non-thermal emission in the radio loud quasar 3C 207

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Abstract

We report the *Chandra* discovery of large scale non-thermal emission in the radio loud quasar 3C 207 (z=0.684). The large scale X-ray components consist of a luminous one–sided jet coincident with the eastern radio jet and a diffuse emission coincident with the western radio counter-lobe.

• The X-ray jet is particularly interesting: comparing the VLA radio data with the *Chandra* flux and spectrum we show that a SSC model is certainly ruled out, and that in order to reproduce the X–ray spectrum (via IC of CMB photons), it is necessary to assume relativistic boosting and an electron spectrum as that expected by shock Fermi I acceleration.

• The diffuse emission in the western radio counter-lobe is best interpreted via IC scattering of the nuclear photons under approximate equipartition conditions.

Comparing the models' predictions with the X-ray spectrum of both the jet and counter-lobe we obtain stringent constraints on the spectral distribution and energetics of the emitting electrons and derive information on the electron acceleration processes at work. One of the main results is that we find evidence for a cut–off or flattening at low energy ($\gamma \leq 100$) in the spectrum of the emitting electrons. Such a cut–off is expected in the framework of shock acceleration theory.

CATEGORY: ACTIVE GALAXIES AND QUASARS