Hard X-Ray Spectrum of GRS 1915+105 During a Radio Flare

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In 1996, the Molonglo Observatory Synthesis Telescope (MOST) observed GRS 1915+105 at 843 MHz and recorded a double-peaked radio flare. In 1997, the Green Bank Interferometer (GBI) recorded a double-peaked flare at 2.25 and 8.3 GHz very similar to the MOST flare. MERLIN high-resolution radio imaging observations at the time of the GBI flaring episode revealed jet ejections (Fender et al. 1999). Based on similarities between the two episodes, it is tempting to consider a jet-ejection scenario for the 1996 flaring event (eg. Hannikainen et al. 1999).

We present RXTE/PCA and HEXTE data from the time of the double-peaked MOST flare, where the spectra have been fit with multi-temperature disk + power-law and multi-temperature disk + sombrero (ie. disk + comptonized hot corona) models.

In addition, we present a CGRO/OSSE spectrum from the time immediately succeeding the second (more intense) radio flare. The OSSE spectrum has been fit with a hybrid model, which takes into account thermal and nonthermal particle energy distributions. The addition of the nonthermal model component provides a much better fit to the high energy portion of the spectrum of GRS 1915+105 than a purely thermal model (e.g. Vilhu 1999). We consider possible scenarios that would accomodate the need for a hybrid solution, including one that would reinforce the jet ejection hypothesis for the 1996 radio flaring event, in which the nonthermal component arises from electrons which are a relic of an ejection event. We also consider the case where there is a persistent nonthermal component, and discuss the pros and cons of the two scenarios.

Fender, R. et al. 1999, MNRAS, 304, 865
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