

## OSSE Observations of Intermediate Polars

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**Abstract.** We present the results of searching for the signals of three intermediate polars in the fields-of-view of observations made using the *OSSE* instrument on the Compton Gamma-Ray Observatory. Only upper limits to the 50–100 keV pulsed flux are obtained in each case, and these are shown to be compatible with extrapolations of earlier *Ginga* spectra.

### 1. The *OSSE* instrument

The Oriented Scintillation Spectrometer Experiment on board the Compton Gamma-Ray Observatory comprises four collimated detectors. Each of these contains a NaI(Tl)/CsI(Na) phoswich viewed by seven photo multiplier tubes. The rectangular field-of-view of the instrument is  $3.8^\circ \times 11.4^\circ$  FWHM and the detectors provide an energy resolution ranging from 27% at 50 keV to 3% at 10 MeV. The on-axis effective area of each detector is  $\sim 480 \text{ cm}^2$  in the energy range of interest here, namely 50–100 keV.

### 2. Observations

No intermediate polars have been targets for *OSSE* observations. However, because of the relatively large field-of-view of the instrument, several intermediate polars have been included in the fields-of-view of other observations. The log of observations used here is shown in Table 1.

Table 1. Log of *OSSE* observations

IP in field-of-view	BG CMi	GK Per	AO Psc
Obs. start date	15 Jun 1991	28 Nov 1991	22 Feb 1993
OSSE target	QSO 0736+016	NGC 1275	MCG 2–58–22
OSSE eff. area/detector	55 $\text{cm}^2$	268 $\text{cm}^2$	153 $\text{cm}^2$
On-source exp.	191 ksec	295 ksec	101 ksec

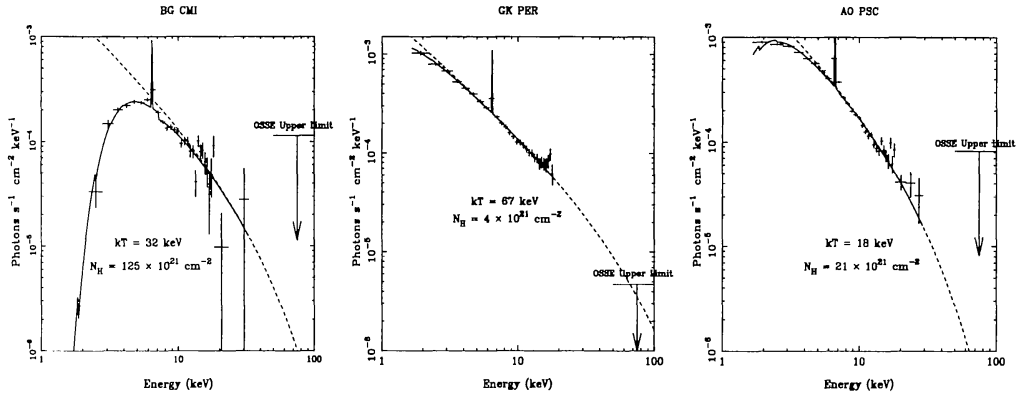


Figure 1. The extrapolated *Ginga* spectra of BG CMi, GK Per and AO Psc showing the OSSE upper limits to the pulsed X-ray flux.

### 3. Results

The data for each observation in the energy range 50–100 keV were accumulated in 16.384 second time bins and folded at the relevant pulse periods for each system, namely 913 s for BG CMi, 351 s for GK Per and 805 s for AO Psc. No evidence for a pulsed signal was found in any of the data sets.

Power spectra were also computed, using the CLEAN method to remove aliasing due to the unevenly sampled data. No significant peaks were detected in any of the data sets.

The upper limits to the 50–100 keV pulsed fluxes in each case were as follows:

- BG CMi : pulsed flux  $< 1.1 \times 10^{-4}$  photons  $s^{-1}$   $cm^{-2}$   $keV^{-1}$
- GK Per : pulsed flux  $< 4.7 \times 10^{-6}$  photons  $s^{-1}$   $cm^{-2}$   $keV^{-1}$
- AO Psc : pulsed flux  $< 8.2 \times 10^{-5}$  photons  $s^{-1}$   $cm^{-2}$   $keV^{-1}$

These upper limits were plotted on extrapolations of the GINGA spectra in the 2–30 keV range, as shown in Figure 1. In each case, the upper limit to the pulsed flux lay on, or above, the extrapolated spectrum.

### 4. Conclusions

The upper limits determined using OSSE are all compatible with the previously determined X-ray spectra of these three intermediate polars. Unfortunately, because of its relatively low sensitivity, OSSE is not a particularly useful instrument for searching for intermediate polars in the hard X-ray region.

**PART 4**  
**Accretion Flows and Structures**

REVIEWS AND CONTRIBUTED PAPERS