SIMULTANEOUS MULTI-WAVELENGTH OBSERVATIONS OF MICROQUASARS (THE MINE COLLABORATION)

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RESUMEN

Presentamos la colaboración internacional MINE (Multi-λ INTEGRAL NEtwork) cuya meta es llevar a cabo observaciones en múltiples longitudes de onda de microcuasares de forma simultánea al satélite INTEGRAL. Los primeros resultados con GRS 1915+105 son muy esperanzadores y junto con los que se obtendrán en el futuro nos ayudarán a comprender la física de los fenómenos de acerción y eyeción relacionados con los sistemas binarios compactos.

ABSTRACT

We present the international collaboration MINE (Multi-λ INTEGRAL NEtwork) aimed at conducting multi-wavelength observations of microquasars simultaneously with the INTEGRAL satellite. The first results on GRS 1915+105 are encouraging and those to come should help us to understand the physics of the accretion and ejection phenomena around a compact object.

Key Words: STARS: INDIVIDUAL (GRS 1915+105) — X-RAYS: BINARIES

1. INTRODUCTION

Microquasars are X-ray binaries producing relativistic jets and thus appear as miniature replicas of distant quasars (Mirabel & Rodríguez 1999). Their emission spectra, variable with time, range from the radio to the γ-ray wavelengths. We present here the first multi-wavelength campaign on GRS 1915+105 involving the INTEGRAL satellite (3keV–10 MeV). This campaign was conducted by the MINE (Multi-λ INTEGRAL NEtwork, see http://elbereth.obspm.fr/~fuchs/mine.html) international collaboration aimed at performing multi-wavelength observations of galactic X-ray binaries simultaneously with INTEGRAL.

2. GRS 1915+105

The microquasar GRS 1915+105 is extremely variable at all wavelengths (see Fuchs et al. 2003a for a review). It hosts the most massive known stellar mass black hole of our Galaxy with \( M = 14 \pm 4 \text{M}_\odot \) (Greiner et al. 2001). In the radio it can show superluminal ejections at arcsec scales (Mirabel & Rodríguez 1994) leading to a maximum distance of 11.2±0.8 kpc (Fender et al. 1999), and a compact jet at milli-arcsecond scales (Dhawan et al. 2000).

We conducted a multi-wavelength observation campaign of GRS 1915+105 in spring 2003 (see Figure 1). Here we focus only on the April observations when ToO (Targets of Opportunity) were triggered by the MINE collaboration. This (nearly) simultaneous campaign involved the VLA, the VLBA, MERLIN and the Ryle Telescope (RT) in radio, the ESO/NTT in IR, RXTE and INTEGRAL in X/γ-rays. More details and description of the April 2 observations can be found in Fuchs et al. (2003b).

Fig. 1. Viewgraph of the observing campaign in spring 2003, indicating the dates, time and involved observatories (GPS = Galactic Plane Survey of INTEGRAL).

Our observations took place during the plateau state of GRS 1915+105 (Fender et al. 1999) i.e. quasi-

