Long term spectral variability in the Soft Gamma-ray Repeater SGR 1900+14

P. Esposito[1,2], S. Mereghetti[2], A. Tiengo[2], and L. Sidoli.[2]

[1]Università degli Studi di Pavia, Dipartimento di Fisica Nucleare e Teorica, via Bassi 6, I-27100 Pavia, Italy

[2]INAF - Istituto di Astrofisica Spaziale e Fisica Cosmica Milano - via Bassini 15, I-20133 Milan, Italy

ABSTRACT: We present a systematic analysis of all the *BeppoSAX* and *XMM-Newton* data of SGR 1900+14. We found that, although not formally required in all the fits, a blackbody component is compatible with all the data sets. The eight observations, spanning eight years, show that the source was brighter than usual in two occasions: ∼20 days after the August 1998 giant flare and during the 10^5 s long X-afterglow following the April 2001 intermediate flare. In the latter case, we explore the possibility of describing the observed short term spectral evolution only with a change of the temperature of the blackbody component. A comparison of the only pre-giant flare observation with the post-giant flare quiescent ones shows that the spectrum of the persistent emission significantly softened after the event. Recently SGR 1900+14 has been established as persistent hard X-ray source using data from the *INTEGRAL* satellite, but we show that a hard tail (above 10 keV) was possibly already detected in the pre-flare *BeppoSAX* data, when the spectrum was harder both in the soft and hard energy ranges. No bursting activity has been seen in the period between the 1998 giant flare and the April 2001 reactivation, and since then only sporadic bursting activity has been seen until November 2002. Therefore we looked for possible effects of this relaxation on the persistent emission and we found that the flux was below its historical level by a factor ∼1.4 during the last *BeppoSAX* observation (April 2002) and by a factor ∼2 during the *XMM-Newton* observation (September 2005), suggesting that the source has entered a quiescent phase.