Discovering and monitoring sub-luminous X-ray binaries using MAXI

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Abstract

Most studies of accreting neutron stars and black holes in X-ray binaries focus on those systems which are accreting at relatively high mass accretion rates and therefore have high associated X-ray luminosities ($> 10^{36}$ erg s^{-1}). Although the existence of very faint, sub-luminous systems is well known, the study of these systems is inhibited by the difficulties in finding them (both the persistent as well as the transient systems) in large numbers using currently available all-sky monitoring instruments. These systems are usually found serendipitously in pointed observations with small field-of-view instruments which have the needed sensitivity to detect them. I will briefly review our current knowledge and understanding about these enigmatically faint systems and how they can be used to probe the extreme physically processes associated with accreting neutron stars and black holes in ways which cannot be done for their brighter cousins. I will also discuss the problems in finding these systems and how MAXI will significantly improve on this situation. The 1 mCrab sensitivity of MAXI within a week (about 10^{35} erg s^{-1} at a distance of 8 kpc) will be extremely useful in finding and monitoring these sub-luminous X-ray binaries.