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Determining the spin-down power of the radio-quiet isolated neutron star RX J0806.4-4123

Monday, 8 July 2024 17:00 (10 minutes)

We present the strategy, analysis, and results of our four-year timing program of RX J0806.4-4123 with NICER. RX J0806.4-4123 belongs to the group of radio-quiet X-ray thermal isolated neutron stars (XTINSs) that are located between the rotation-powered pulsars and the magnetars in the P-Pdot diagram. The slowly rotating XTINSs constitute a key population to learn about the structure, physics and population diversity of neutron stars. RX J0806.4-4123 is close (~250pc) and shows interesting multiwavelength properties that seemingly deviate from those of similar neutron stars. The spin-down power is a critical parameter in the physical interpretation of the multiwavelength findings. We will also discuss a simple and universal method for estimating the uncertainties of frequency and its derivative based on the Z^2_K statistics (K is the number of Fourier harmonics).

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