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Long-term timing of the double pulsar J0737-3039 with XMM-Newton

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The relativistic double neutron star binary PSR J0737-3039 shows clear evidences of orbital phase-dependent wind-companion interaction, both in radio and X-rays. In this work, we performed the timing analysis of 2006 and 2011 XMM-Newton large programs data. We detected pulsations from PSR J0737-3039A (PSR A) - with very high precision in measuring the spin period and PSR J0737-3039B (PSR B) despite its previous disappearance in radio. Interaction of PSR A's wind with PSR B's magnetosphere could have determinate the observed orbital pulsed flux and profile variations of PSR B as well as a loss of pulsar phase coherence on timescales of years. Evidence of orbital flux variability (~7%) is observed for the first time, involving a bow-shock scenario between PSR A's wind and PSR B's magnetosphere.

Biography

Maria Noemi Iacolina has completed her PhD in the year 2010 at Cagliari University – Physics Department. She is doing her Postdoctoral studies at the INAF - Astronomical Observatory of Cagliari. At present, she is staff member of the Operation Team of the Sardinia Radio Telescope (SRT), a 64 m radio antenna located in Italy. She is the PI of a project for the building of a radioastronomical receiver to be installed at the SRT, granted by the local government. She has developed a software package inspecting the source visibility for radio astronomical international facilities. Her scientific interests concern the multiwavelength studies of compact objects as pulsars, in particular she performed the long term X-ray timing of the only known double pulsar system.

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