

A multiwavelength study of SXP 1062, the long-period X-ray pulsar associated with a supernova remnant

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Abstract

© 2018 The Author(s). SXP 1062 is a Be X-ray binary (BeXB) located in the Small Magellanic Cloud. It hosts a longperiod X-ray pulsar and is likely associated with the supernova remnant MCSNRJ0127-7332. In this work we present a multiwavelength view on SXP 1062 in different luminosity regimes. We consider monitoring campaigns in optical (OGLE survey) and X-ray (Swift telescope). During these campaigns a tight coincidence of X-ray and optical outbursts is observed. We interpret this as typical Type I outbursts as often detected in BeXBs at periastron passage of the neutron star (NS). To study different X-ray luminosity regimes in depth, during the source quiescence we observed it with XMM-Newton while Chandra observations followed an X-ray outburst. Nearly simultaneously with Chandra observations in X-rays, in optical the RSS/SALT telescope obtained spectra of SXP 1062. On the basis of our multiwavelength campaign we propose a simple scenario where the disc of the Be star is observed face-on, while the orbit of the NS is inclined with respect to the disc. According to the model of quasi-spherical settling accretion our estimation of the magnetic field of the pulsar in SXP 1062 does not require an extremely strong magnetic field at the present time.

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Keywords

Galaxies: individual: Small Magellanic Cloud -X-rays: binaries, Pulsars: individual: SXP 1062, Stars: neutron

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