Paper ID: 77385
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IAF SYMPOSIUM ON ONGOING AND NEAR FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS (A7)
Science Goals and Drivers for Future Exoplanet, Space Astronomy and Space Physics (2)

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# SPECTRAL CLASSIFICATION OF SELECTED STELLAR X-RAY SOURCES IN THE SMALL MAGELLANIC CLOUD (SMC)

**Abstract**

X-ray binaries (XRBs) are stellar systems consisting of a collapsed stellar object, such as a neutron star, white dwarf, or black hole, that accretes material from a stellar companion. The stellar companion can be either low mass (up to a few times the mass of the Sun) or high mass (a few tenths of the mass of the Sun). In this study, we are mainly focusing on high mass X-ray binaries (HMXBs) hosting an early type companion star (mostly a B star) orbiting a magnetized neutron star. Previous studies of the accreting binary population in the SMC "bar" have provided several insights into the physical mechanisms of accretion onto neutron stars and the connection of accreting binaries with star formation. Spectral classification of a handful of X-ray sources in the Small Magellanic Cloud (SMC) that are selected with the Chandra X-ray Observatory and followed up by the VIMOS instrument onboard the VLT have been analyzed. This allows us to identify and characterize the optical counterpart of the Be X-ray Binaries (BeXRBs) population through a conducted survey of representative regions of the SMC and X-ray luminosities down to $\sim 4 \times 10^{32}$ erg/s. Some of the sources analyzed showed prominent H line in emission. In addition these sources have been successfully classified as main sequency $\sim$ B2-B4Ve stars. As a result, the spectral type of the donor stars and the mass distribution in these systems within the SMC could be determined. This will provide the most complete census of BeXRBs outside our Galaxy in regions with different star-formation histories. This is important because it will allow for sufficient statistics to be gathered in different regions of the SMC, in order to establish and compare the donor-mass distribution in various populations for the very first time.