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Identifying new narrow-line Seyfert 1 galaxies and white dwarfs from the second ROSAT all-sky survey catalogue

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The second ROSAT all-sky survey (2RXS) source catalogue has now been published, containing approximately 135000 X-ray sources. Spectral fits using three different models were reported in this catalogue: a power law, an optically thin plasma emission model and an optically thick blackbody model. For the current study, all sources with power law photon indices greater than 3 have been selected from the main 2RXS catalogue, provided that the error in the fitted index is smaller than 1.5. This yielded a list of 1022 sources, representing the 2RXS sample with the softest X-ray spectra. Sources with such soft X-ray spectra can be expected to be primarily narrow-line Seyfert 1 galaxies (NLS1s) or white dwarfs (WDs). Many of the soft 2RXS sources are already known as NLS1s or WDs, but several are still unidentified, and this project is aimed at confirming the classification for these unknown sources. One of the main challenges of the process is evidently to distinguish between NLS1s and WDs. To aid in this process, a study of the infrared properties of known NLS1s and WDs has been performed, based on entries in the AllWISE catalog. It was found that the two classes can be well separated based on infrared magnitudes and colours, allowing a preliminary identification and classification to be made for the unknown sources. Follow-up optical spectroscopy and multi-wavelength archival studies will be performed to confirm the preliminary classification, and also to investigate the properties of these sources.

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