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The XMM-Newton survey of the Small Magellanic Cloud: Discovery of the 11.866 s Be/X-ray binary pulsar XMMUJ004814.0-732204 (SXP11.87)

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One of the goals of the XMM-Newton survey of the Small Magellanic Cloud is the study of the Be/X-ray binary population. During one of our first survey observations a bright new transient - XMMUJ004814.0-732204 - was discovered. We present the analysis of the EPIC X-ray data together with optical observations, to investigate the spectral and temporal characteristics of XMMUJ004814.0-732204. We found coherent X-ray pulsations in the EPIC data with a period of (11.86642 +/- 0.00017) s. The X-ray spectrum can be modelled by an absorbed power-law with indication for a soft excess. Depending on the modelling of the soft X-ray spectrum, the photon index ranges between 0.53 and 0.66. We identify the optical counterpart as a B = 14.9mag star which was monitored during the MACHO and OGLE-III projects. The optical light curves show regular outbursts by ~0.5 mag in B and R and up to 0.9 mag in I which repeat with a time scale of about 1000 days. The OGLE-III optical colours of the star are consistent with an early B spectral type. An optical spectrum obtained at the 1.9 m telescope of the South African Astronomical Observatory in December 2009 shows H_α emission with an equivalent width of 3.5 +/- 0.6 Å. The X-ray spectrum and the detection of pulsations suggest that XMMUJ004814.0-732204 is a new high mass X-ray binary pulsar in the SMC. The long term variability and the H_α emission line in the spectrum of the optical counterpart identify it as a Be/X-ray binary system.

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