

Accreting isolates neutron stars

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ABSTRACT: The appearance of an isolated magnetized neutron star accreting material from interstellar medium is discussed. The magnetospheric boundary of the star under the conditions of interest is interchange stable. Therefore, the plasma entry into the stellar magnetic field is governed by diffusion. The rate of this process is a factor of 200 smaller than the maximum possible rate of mass capture by the star from its environment. This allows us to limit the X-ray luminosity of the star to $< 5 \times 10^{29}$ erg s⁻¹. We find that the cooling of the material at the base of the accretion column is dominated by the cyclotron and bremsstrahlung emission mechanisms. The accretion power in this case is radiated mainly in a form of hard (> 5 keV) X-rays, which represents a reasonable explanation of a lack of success in searching for these objects with ROSAT. The calculation of the expected emission from these stars allows us to make an estimate of the X-ray background from that Galactic population. A possibility for identification of these sources with current X-ray missions will be briefly addressed.