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High-energy emission in SGRs/AXPs

In this work, we investigate the high-energy emission in SGRs/AXPs, neutron stars with extreme magnetic field, named magnetars. The observed high-energy emission in the X-rays and gamma-ray bands are explained. The outer gap accelerator model considers the generation of high-energy emission far away from the surface of the star in a combination of curvature radiation and inverse Compton scattering. The high-energy emission is constrained by employing the death-lines, the condition for pair-production and the generation of hard X and soft gamma rays. From the point of the death-lines and death-zones obtained here by the outer gap model the SGRs/AXPs should not emit hard X-rays, since they are below the death-line, in disagreement with the observations: SGRs/AXPs are characterized by short and intense burst in the hard X-rays (few hundred keV). The reason for the absence of hard X-Ray emission in the outer gap model, is the low magnetic field strength at the light cylinder, which is too far away from the star's surface in comparison to millisecond γ -rays pulsars.

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Track Classification: Compact Objects and Stellar Evolution (CO): Massive white dwarfs and related phenomena