

Possible Suzaku detection of non-thermal X-ray signals from a rotating magnetized white dwarf

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For decades, rotating neutron stars (NSs) have been regarded as a textbook example of astrophysical particle acceleration sites, but details of the acceleration mechanism remains a mystery; for example, we cannot yet observationally distinguish "polar cap" models from "outer gap" models. To solve the model degeneracy, it is useful to study similar systems with much different physical parameters. Strongly-magnetized white dwarfs (WDs) are ideal for this purpose, because they have essentially the same system geometry as NSs, but differ largely from NSs in the system parameters including the size, magnetic field, and the rotation velocity, with the induced electric field expected to reach 10^{13} to 10^{14} eV. Based on this idea, the best candidate among WDs, AE Aquarii, was observed with the fifth Japanese X-ray satellite, Suzaku. The hard X-ray detector (HXD) onboard Suzaku has the highest sensitivity in hard X-ray band over 10 keV. A marginal detection in hard X-ray band has been achieved with the HXD, and was separated from the thermal emission. The flux corresponds to about 0.02