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Modeling X-ray Emission and the SED of the Binary Radio Pulsar AE Aquarii

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The highly transient novalike variable AE Aqr is perhaps an ideal laboratory to study accretion related astrophysical fluid dynamics. It consists of a fast spinning highly magnetic white dwarf (WD) orbiting, and accreting mass, from a low-mass main sequence companion. The system emits, and has been detected in almost all wavelengths. AE Aqr is in a propeller state, and most of its emission properties are associated with the turbulent interaction between the accretion flow and the fast rotating magnetosphere of the WD. We have analysed its X-ray spectra using contemporaneous Chandra and Swift X-ray data. The results of this study show that the X-ray emission has both thermal and non-thermal characteristics. The thermal X-ray emission is modeled to be the result of bremsstrahlung emission of heated mass outflow above the polar caps, whereas the non-thermal X-ray emission is the result of synchrotron radiation of accelerated electrons outside the light cylinder radius of the WD. In this paper, some of the results, based on the constraints of the proposed thermal and non-thermal emission mechanisms, will be presented.

**Level (Hons, MSc,
 PhD, other)?**

PhD

**Consider for a student
 award (Yes / No)?**

Yes

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

Yes

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