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An X-Ray Study of Two B+B Binaries: AH Cep and CW Cep

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Abstract

© 2017. The American Astronomical Society. All rights reserved. AH Cep and CW Cep are both early B-type binaries with short orbital periods of 1.8 days and 2.7 days, respectively. All four components are B0.5V types. The binaries are also double-lined spectroscopic and eclipsing. Consequently, solutions for orbital and stellar parameters make the pair of binaries ideal targets for a study of the colliding winds between two B stars. Chandra ACIS-I observations were obtained to determine X-ray luminosities. AH Cep was detected with an unabsorbed X-ray luminosity at a 90% confidence interval of erg s -1 , or, relative to the combined Bolometric luminosities of the two components. While formally consistent with expectations for embedded wind shocks, or binary wind collision, the near-twin system of CW Cep was a surprising nondetection. For CW Cep, an upper limit was determined with, again for the combined components. One difference between these two systems is that AH Cep is part of a multiple system. The X-rays from AH Cep may not arise from standard wind shocks nor wind collision, but perhaps instead from magnetism in any one of the four components of the system. The possibility could be tested by searching for cyclic X-ray variability in AH Cep on the short orbital period of the inner B stars.

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Keywords

binaries, early-type - stars, individual (AH Cep, CW Cep) - stars, massive - stars, stars, winds, outflows - X-rays

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