X-Ray Emission from Stellar Coronae

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[Invited Review Talk, 30 min.]

Abstract

Stellar coronae are ideal laboratories to study physical processes in tenuous cosmic plasmas, such as heating mechanisms in magnetized environments, elemental fractionation processes, particle acceleration mechanisms, non-equilibrium processes etc. They provide important and convenient diagnostics for the presence of magnetic fields and the role of ionizing flux in stellar environments at different stages of stellar evolution. Chandra's high spectral and angular resolution has opened new windows to the study of stellar coronae. This presentation will summarize highlights in coronal research from the first two years of Chandra, with emphasis on the following aspects: i) Temperature stratification of stellar coronae as derived from detailed spectroscopy, and systematic differences between different stellar types or different stages of stellar evolution; ii) elemental abundance patterns in various stellar coronae, and a discussion of possible models to explain them; iii) observations of flares and implications for our understanding of flare physics; iv) possible implications for coronal heating models; and v) X-ray emission in the context of stellar evolution, in particular from young and forming stars, and from brown dwarfs. Some cross-reference to ongoing studies with XMM-Newton will be included, as well as information from other wavelength regimes, in particular from coordinated observing campaigns.

CATEGORY: NORMAL STARS AND WHITE DWARFS