Crazy Coronal Abundances

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[Contributed talk, 15min.]

Abstract

Chandra high resolution spectra of active late-type stars show a pattern of strange coronal abundances. Elements with low first ionization potential (FIP < 10 eV) like Fe are underabundant, whereas elements with FIP > 10 eV (in particular, Ne and Ar) are overabundant compared to solar photospheric values. Preliminary evidence for this pattern was already seen in the ROSAT and ASCA data, but the Chandra and XMM-Newton data greatly strengthen the case. The coronal abundances in active stars are especially interesting because the solar corona shows the opposite effect (FIP deficiency). We will summarize the new results and comment on their limitations. In particular, We will present the coronal abundances of four active stars observed with the HETG – AB Dor, AU Mic, 44 Boo, and σ^2 CrB. The solar FIP and stellar anti-FIP effects can be understood (at least in part) in terms of fractionation effects in the chromosphere and perhaps diffusion in the corona. We will present theoretical and heuristic models that can explain the observed crazy coronal abundances.

CATEGORY: NORMAL STARS AND WHITE DWARFS