Cometary X-rays - the View After the First Chandra Cycle

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Abstract

The unexpected discovery of x-ray emission from Comet Hyakutake in March 1996 (Lisse et al. 1996) has produced a number of questions about the physical mechanism producing the radiation. The original detection and subsequent observations (Dennerl et al. 1997, Mumma et al. 1997, Krasnopolsky et al. 1998, Owens et al. 1998, Lisse et al. 1999) have shown that the very soft (best fit thermal bremsstrahlung model kT 0.2 keV) emission is due to an interaction between the solar wind and the comet's atmosphere. Using the results from the 15 comets detected to date in x-rays, we report on the latest results on cometary x-ray emission, including new results from Chandra and XMM. As-observed morphologies, spectra, and light curves will be discussed. Our emphasis will be on understanding the physical mechanism producing the emission, and using this to determine the nature of the cometary coma, the structure of the solar wind in the heliosphere, and the source of the local soft x-ray background.

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