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Title:

Modeling contamination migration on the Chandra X-ray Observatory II

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Abstract:
During its first 14 years of operation, the cold (about -60°C) optical blocking filter of the Advanced CCD Imaging Spectrometer (ACIS), aboard the Chandra X-ray Observatory, has accumulated a growing layer of molecular contamination that attenuates low-energy x rays. Over the past few years, the accumulation rate, spatial distribution, and composition may have changed, perhaps partially related to changes in the operating temperature of the ACIS housing. This evolution of the accumulation of the molecular contamination has motivated further analysis of contamination migration on the Chandra X-ray Observatory, particularly within and near the ACIS cavity. To this end, the current study employs a higher-fidelity geometric model of the ACIS cavity, detailed thermal modeling based upon monitored temperature data, and an accordingly refined model of the molecular transport.