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Investigating the interstellar dust through the Fe K-edge

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The absorption fine structures, imprinted by the interaction between X-rays and solid particles, can reveal the composition, the size, and the structure of cosmic dust (Costantini et al. 2012). The iron K-edge is particularly important because it is well visible in the X-ray band providing a large extinction especially for lines of sight with $N_{\text{H}} > 10^{23} \text{cm}^{-2}$ ($A_{\text{V}} > 45$). We model the iron edge using the newly acquired synchrotron data, performed on a set of cosmic dust analogues (Rogantini et al. 2018). Here we highlight the potential of the iron K-edge to: 1) study the chemical properties of iron bearing grains; 2) investigate the size, the crystallinity, and the composition of cosmic silicates in dense clouds of our Galaxy. The synergy between high resolution X-ray instruments and accurate synchrotron measurements provides a unique method to look through molecular clouds in the Galactic Centre and to understand the role of iron in the grain growth process in the interstellar matter.

Consider for a poster?

Yes

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