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Probing the interstellar dust with X-rays: The Fe L and O K edges

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The content of the interstellar medium (ISM) is very important for the evolution of the Galaxy and for star formation processes. Today it is known that the structure of the ISM mainly consists of gas, dust and molecules. However, the composition of dust in the ISM is not yet fully understood. Insights can be gained from the X-ray band. High-resolution X-ray spectroscopy is a powerful method to investigate the interstellar dust composition. With X-ray spectra of bright background sources, it is possible to determine the silicate content and the physical properties of the diffuse regions in the ISM. We can probe the different phases of the interstellar medium and the chemical composition of gas along different lines of sight. In this work we analyse XMM-Newton and Chandra observations of the Low Mass X-ray Binary GX 9+9. This source is an ideal candidate to study the ISM because of known absorption by dust, cold and warm gas along the line of sight. For our modelling we use new laboratory measurements of different chemical composition of dust gained with the Electron Microscope Spectrometer in Cadiz, Spain. In particular, we focus here on the Fe L and O K edges, two abundant elements to study the chemical composition of dust grains along this line of sight.

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