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X-ray in Zeta-Ori

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Abstract

Nearby star-forming regions are ideal laboratories to study high-energy emission processes but they usually present high absorption what makes difficult to detect the stellar population inside the molecular complex. As young late-type stars show high X-ray emission and X-ray photons are little absorbed by interstellar material, X-ray dedicated surveys are an excellent tool to detect the low-mass stellar population in optically absorbed regions. In this work, we present a study of the star-forming region Zeta-Ori and its surroundings. We combine optical, infrared and X-ray data. Properties of the X-ray emiting plasma and infrared features of the young stellar objects detected in the XMM-Newton observation are determined. The southern part of the Orion B giant molecular cloud complex harbor other star forming regions, as NGC 2023 and NGC 2024, we use this regions to compare. We study the spectral energy distribution of X-ray sources. Combining these results with infrared, the X-ray sources are classified as class I, class II and class III objects. The X-ray spectrum and ligth curve of detected X-ray sources is analyzed to found flares. We use a extincion-independent index to select the stars with circumstellar disk, and study the relationship between the present of disk and the flare energy. The results are similar to others studies and we conclude that the coronal properties of class II and class III objects in this region do not differ significantly from each other and from stars of similar infrared class in the ONC.