The X-ray Emissivity of Low-Density Stellar Populations

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High-density stellar environments allow for close interactions between stars, which can lead to dense stellar remnants being placed into stellar binaries. In close orbits, matter can transfer from a normal star to the stellar remnant, producing radiation up to X-rays - for white dwarfs, these are cataclysmic variables (CVs). Observations of faint X-ray sources indicate CVs are more frequent in denser clusters and link dynamical processes with fainter X-ray binaries.[1,2,3,4,5] However, previous studies noted that the total X-ray emissivity is lower in denser environments with no unique bright X-ray sources.[6,7,8,9,10,11] So, either binaries are destroyed quickly in dense environments or open clusters lose a large fraction of their non-X-ray-emitting mass.[12,13,14] We address this by considering the X-ray emissivity in a range of environments and densities. We find that the X-ray emissivity of environments below 10000 solar masses per parsec cubed are not density dominated. We find a significant correlation between X-ray emissivity and binary fraction and less significant correlations with metallicity and age. The available data is limited and sampling via bootstrap gives less significant correlations.

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