The infrared extinction law in different interstellar environments

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The variation of interstellar extinction law has long been known at the UV/Visual wavelengths (Draine 2003). According to the study of more than 100 sightlines (Jiang et al. 2006; Zasowski et al. 2009; Gao et al. 2009), we found that the infrared extinction law is neither universal, while how the IR extinction law changes is not clear. This work tries to reveal whether the IR extinction law relates to the interstellar environment and how it relates. Based on the combined data by the near-IR 2MASS and mid-IR *Spitzer*/GLIMPSE, the interstellar extinction law in the corresponding bands from about 3μm to 8μm is derived around the dark cloud region Coalsack (l=300-306°), the giant H II region RCW 49 (l=284°), the infrared dark cloud region(l=28°) and the diffuse region (l=29°). The Coalsack region is divided into the weak, transition and dense sub-regions according to three parameters, i.e. the visual extinction (Av), the infrared emission (*Spitzer*'s image), and the molecular gas emission (CO). The relative extinction A_λ/A_{Ks} is derived by the color-excess method in the IRAC bands. It is found that A_λ/A_{Ks} varies in different environments with the highest value in the diffuse region and the lowest in the dense region at the IR bands.

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