

3D Structure and Extinction Law of Nearby Molecular Clouds

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Molecular clouds (MCs), as the star birthplaces, are generally dense that causes high extinction. A precise estimation of the extinction is crucial to revealing the true brightness and color of the stars embedded and behind the cloud. In addition, molecular clouds are place for dust growth. The determination of the extinction law of MCs would help understand the dust evolution in various star-forming environments. The nearby MCs to be studied in this work, specifically the Taurus MC (hereafter TMC), Orion MC (OMC), Perseus MC (PMC) and California MC (CMC), represent different including massive and low-mass star-forming environments. With precise measurements and large quantity of tracers, the extinction of MCs can be calculated with high precision for each MCs, and therefore serve as the references of extinction for star forming regions.

The data are based on the LAMOST and APOGEE spectroscopy with photometry data from FUV band of GALEX to W3 band from WISE. Extinctions are calculated from color excess derived from the Blue Edge methods. In combination with the distance from the Gaia, a 3D extinction map and the structure of these MCs can be retrieved and the clouds that overlap in the sky area can be separated. Also, the differences of extinction law in each MCs are studied from UV band to IR band, demonstrating the different interstellar environment in different MCs.