

DIBs and UV Extinction Curve: The Missing Link

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The diffuse interstellar bands (DIBs) are ubiquitous absorption spectral features arising from the interstellar medium (ISM). Since their first detection nine decades ago, over 600 DIBs have been observed in the visible and near-infrared wavelength range in both the Milky Way and external galaxies, both nearby and distant. However, the identity of the species responsible for these bands remains as one of the most enigmatic mysteries in astrophysics. An equally mysterious interstellar spectral signature is the 217.5 nm extinction bump, the strongest absorption feature observed in the ISM. Its carrier also remains unclear since its first detection nearly half a century ago.

We explore the possible relations between these two mysterious interstellar phenomena and try to place constraints on the properties of their enigmatic carriers. We also examine the relation between the far ultraviolet (far-UV) extinction and the DIBs: on one hand, they may be anti-correlated as the shielding of energetic photons by far-UV extinction would protect the DIB carriers from being photo-dissociated; on the other hand, they may be correlated *if* the DIB carriers result from the fragmentation of small grains responsible for the far-UV extinction. We also discuss the best way to characterize the far-UV extinction: the steepness of the far-UV extinction rise, the total amount of far-UV extinction, the far-UV color excess, or the total amount far-UV extinction integrated with inverse wavelength?

DIBs vs. 2175Å Extinction Bump and far-UV Extinction

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