

Connecting Dust and Galaxy Properties at High Redshift

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The extinction curves of interstellar dust in the local Universe show significant diversity along different sightlines and between different galaxies, in particular with regards to the presence (and relative strength) of the 2175 Angstrom bump feature. These locally-derived extinction curves are often used to correct for the effects of dust in the SEDs of galaxies at high redshift ($z > 1$), but this process is quite uncertain. We use a large sample of high- z GRBs with well-studied afterglows permitting measurement of the extinction curve (including the presence/absence and relative strength of the 2175 Angstrom feature) along the burst sightline to explore the connection between extinction and bulk galaxy properties at high redshift. While host properties are strongly correlated the *amount* of dust seen along the GRB sightline (more obscured GRBs are located within more massive hosts), the nature of the dust does not show strong correlations with the host's overall properties. In particular, we demonstrate that the 2175 Angstrom feature can survive in galaxies with very high specific star-formation rate (and therefore a strong UV radiation field) in some cases, as well as within more quiescently star-forming galaxies. This suggests that dust properties within high-redshift galaxies may be influenced more by local phenomena than global ones and that, as in the Milky Way, extinction curves may differ substantially along different sightlines within high- z galaxies as well as between different galaxies.