

A Search for Diffuse Interstellar Bands in Intermediate Redshift DLAs

**Brandon Lawton¹, Brian York², Sara L. Ellison²,
Christopher W. Churchill¹, Rachel A. Johnson³
and Theodore P. Snow⁴**

¹Department of Astronomy, New Mexico State University,
Las Cruces, NM 88003, USA
email: blawton@nmsu.edu, cwc@nmsu.edu

²Department of Physics and Astronomy, University of Victoria,
Victoria, BC, V8W 3P6, Canada
email: brian@uvic.ca, sarae@uvic.ca

³Department of Astrophysics, Oxford University,
Oxford, OX1 3RH, UK
email: raj@astro.ox.ac.uk

⁴Center for Astrophysics and Space Astronomy, University of Colorado,
Boulder, CO 80309, USA
email: Theodore.Snow@Colorado.EDU

Abstract.

There has been a renewed interest in searching for diffuse interstellar bands (DIBs) due to their probable connection to organic molecules and, thus, their possible link to life in the Universe. Within the Milky Way there have been more than 300 DIBs discovered to date; most of the DIBs are seen in the visible part of the electromagnetic spectrum. Although abundant in the Milky Way, DIBs have only been found in a few extragalactic sources and only in one source via QSO absorption lines. Other researchers in this field have shown tight correlations between a specific DIB equivalent width (EW) and reddening as well as DIB EW and neutral hydrogen column density. However, DIB strengths do not correlate with molecular hydrogen. Due to these results we show why QSO absorption line systems containing very high column densities of neutral hydrogen (Damped Lyman-alpha absorbers, DLAs) are the appropriate sites for searching extragalactic sources for DIBs. Our group is actively searching intermediate redshift DLAs for DIBs. Six of our DLA targets are presented. Our EW limits for the $\lambda 5780$ DIB line strongly suggests that DIB abundance is below the Milky Way expected value or that metallicity plays a large role in DIB strengths.

Keywords. quasars: absorption lines; (galaxies:) absorption lines; galaxies: ISM, evolution; astrobiology; astrochemistry
