Molecular Gas, Dust, and Star Formation in Galaxies
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Lyα vs. fundamental properties of galaxies

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Abstract. We obtained *HST* COS Lyα spectroscopy for 20 galaxies that were Hα-selected from the Kitt Peak International Spectroscopic Survey data release. We cover redshifts of $z = 0.02 - 0.06$ and a broad range in metallicity, reddening, and luminosity. We investigate correlations between the properties of the Lyα-lines and fundamental properties of the galaxies. Our seven emitters have: equivalent widths in the range EW(Lyα) $= 1 - 12$ Å, i.e., below the completeness limits of higher redshift studies; extinction corrected Lyα/Hα ratios of at most 12-15% of the case B recombination theory value; and O I λ1302 ISM absorptions blueshifted to $\langle v(\mathrm{O\,I})\rangle = -117\pm40$ km/s, which are consistent with H I gas outflows. Six emitters have P-Cygni-like Lyα profiles with peaks redshifted to $\langle v\rangle = 172 \pm 25$ km/s, and one of our face-on spiral galaxies has two Lyα peaks separated by 370 km/s. The latter peaks are such that the blueshifted peak is twice as strong as the redshifted peak. The rest of the galaxies show Lyα absorption troughs centered at $\langle v\rangle = 19$ km/s and O I λ1302 absorptions centered at $\langle v(\mathrm{O\,I})\rangle = -34 \pm 25$ km/s, which is consistent with static or low velocity H I gas. Our two most metal poor and least reddened galaxies, which have large Hα equivalent widths are absorbers. The spiral galaxies in our sample have Lyα in single emission, double emission, or absorption. There appears to be a correlation between the Hα derived SFR and the strength of the Lyα emission but our sample is small. Our observations cover regions of at most 3 kpc in diameter and may miss a significant fraction of the resonantly scattered Lyα emission. This work is supported by NASA grant N1317.

Keywords. galaxies: starburst — galaxies: stellar content — ultraviolet: galaxies — ultraviolet: ISM

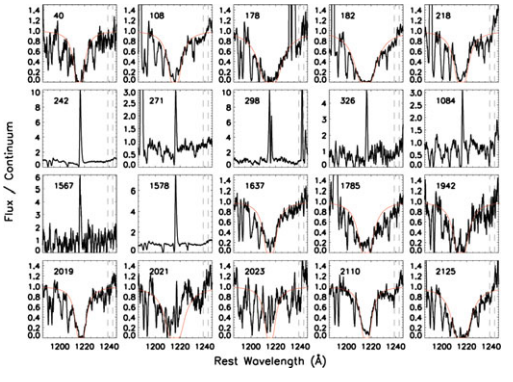

Figure 1. Lyα-line profiles with Voigt profiles overlaid on the absorbers. The vertical lines mark the position of the stellar-wind N V λ1240 doublet (from Wofford *et al.*, *submitted* to ApJ).

Reference

Wofford, A., Leitherer, C., & Salzer, J., COS Science Team 2013, *submitted to ApJ*