X41b **A Close Comparison between Observed and Modeled Lyα Lines for $z \sim 2.2$ Lyman Alpha Emitters**

T. Hashimoto (CRAL), M. Ouchi, K. Shimasaku, T. Shibuya, Y. Ono, R. Goto (Univ. of Tokyo), A. Verhamme, D. Schaerer, K. Nakajima (Geneva Observatory), and M. Rauch (OCIW)

We present the results of a Lyα profile analysis of 12 Lyα emitters (LAEs) at $z \sim 2.2$ with high-resolution Lyα spectra. We find that all 12 objects have a Lyα profile with the main peak redward of the systemic redshift defined by nebular lines, and five have a weak, secondary peak blueward of the systemic redshift (blue bump). The average velocity offset of the red main peak (the blue bump, if any) with respect to the systemic redshift is $\Delta v_{\mathrm{Ly}\alpha,\mathrm{r}} = 174 \pm 19$ km s^{-1} ($\Delta v_{\mathrm{Ly}\alpha,\mathrm{b}} = -316 \pm 45$ km s^{-1}), which is smaller than (comparable to) that of Lyman-break galaxies (LBGs). The outflow velocities inferred from metal absorption lines in three individual and one stacked spectra are comparable to those of LBGs. The expanding shell model constructed by Verhamme et al. (2006) reproduces not only the Lyα profiles but also other observed quantities including the outflow velocity and the FWHM of nebular lines for the non-blue bump objects. On the other hand, the model predicts too high FWHMs of nebular lines for the blue bump objects. We show that the small $\Delta v_{\mathrm{Ly}\alpha,\mathrm{r}}$ values of our sample can be explained by low neutral-hydrogen column densities of $< \log(N_{\mathrm{HI}}) > = 18.9$ cm^{-2}. This value is more than one order of magnitude lower than those of LBGs but is consistent with recent findings that LAEs have high ionization parameters and low HI gas masses. This result suggests that low N_{HI} values, giving reduced numbers of resonant scattering of Lyα photons, are the key to the strong Lyα emission of LAEs.