Occurrence and global properties of Narrow Associated Absorption Lines in XQ-100 Legacy Survey
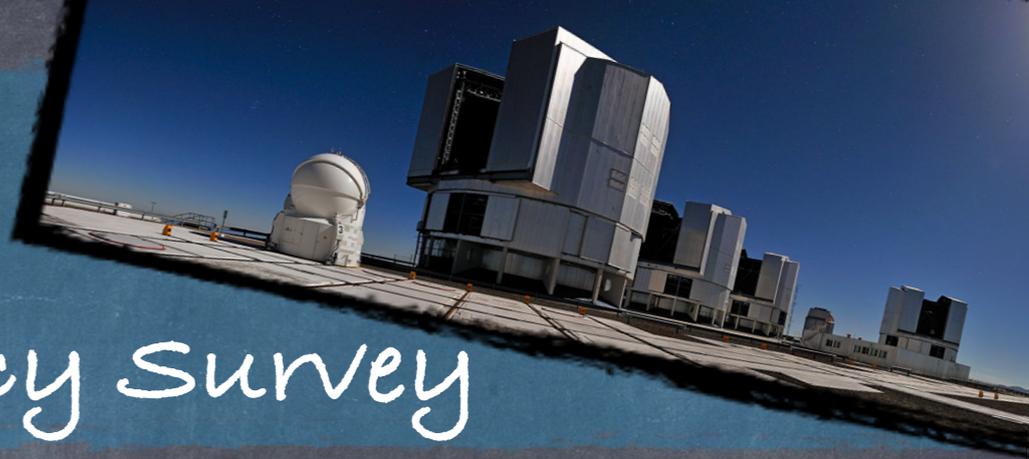
Environment $\longrightarrow$ 100 QSOs with z > 3.5

Absorption lines $\longrightarrow$ X-Shooter Intermediate resolution spectra (VIS band ~ 8800)
Large spectral coverage (UVB, VIS, NIR)

Statistical study of NAL properties $\longrightarrow$ Basic structure of QSO outflows
Ionization structure

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Spineto 2015

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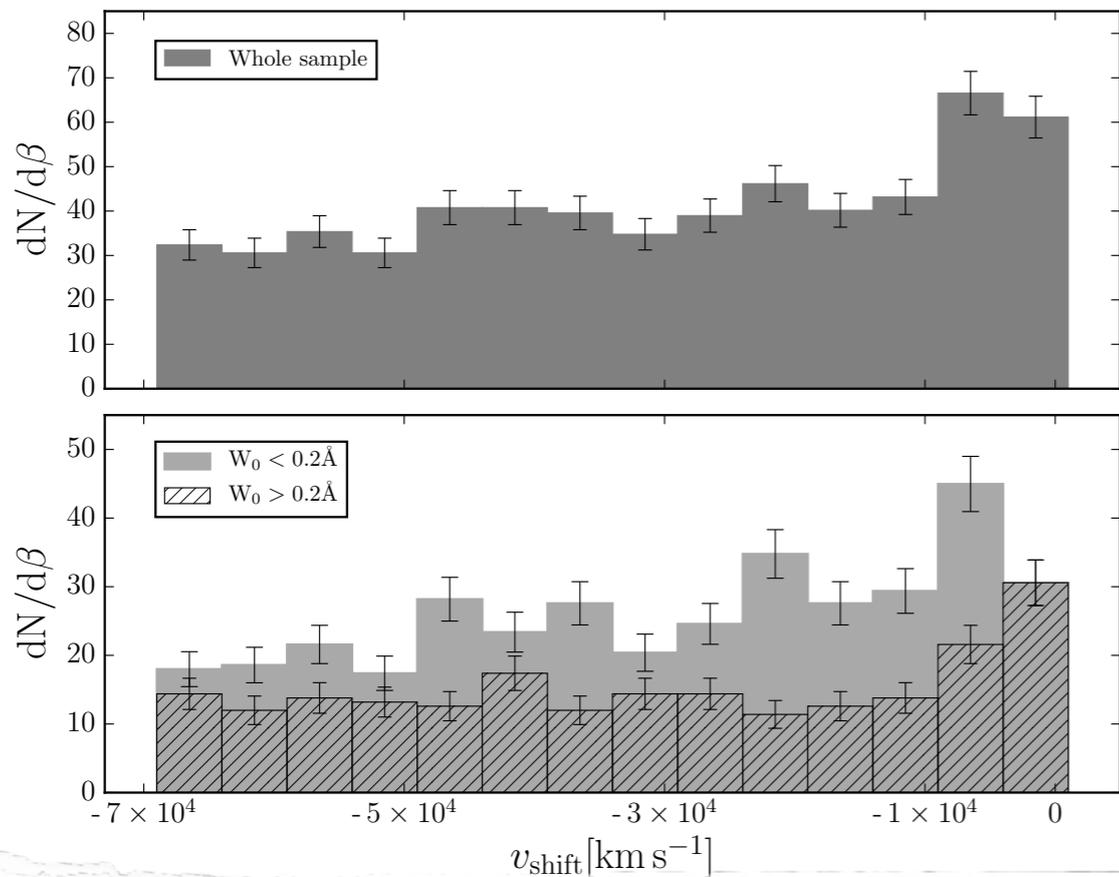
Empirical evidence

Velocity offset distribution

$$\beta \equiv \frac{v_{shift}}{c} = -\frac{(1+z_{em})^2 - (1+z_{ab})^2}{(1+z_{em})^2 + (1+z_{ab})^2}$$

NV/CIV EW vs SiIV/CIV EW