Gas inflow and outflow in an interacting high-redshift galaxy

The remarkable host environment of GRB 080810 at $z = 3.35$

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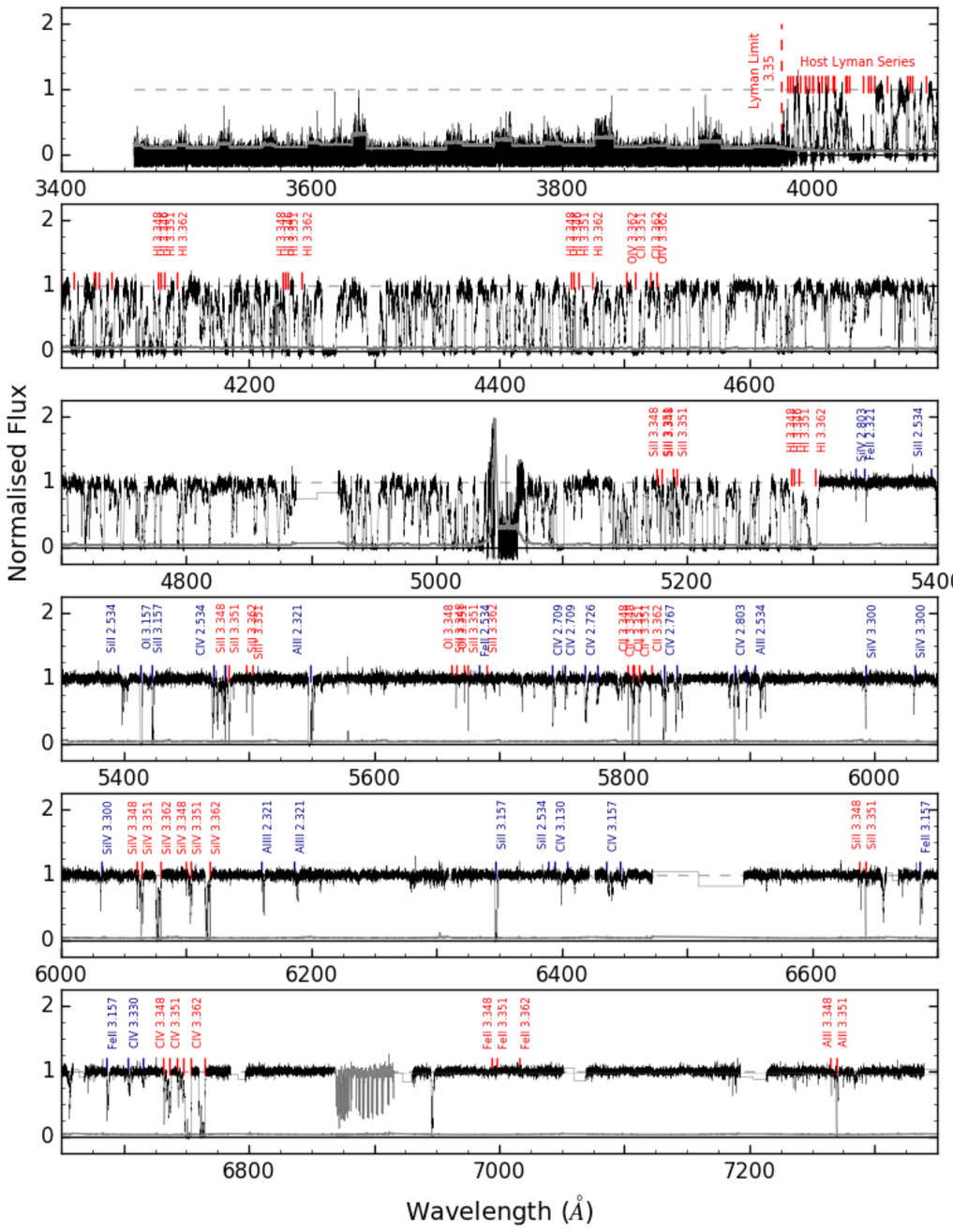
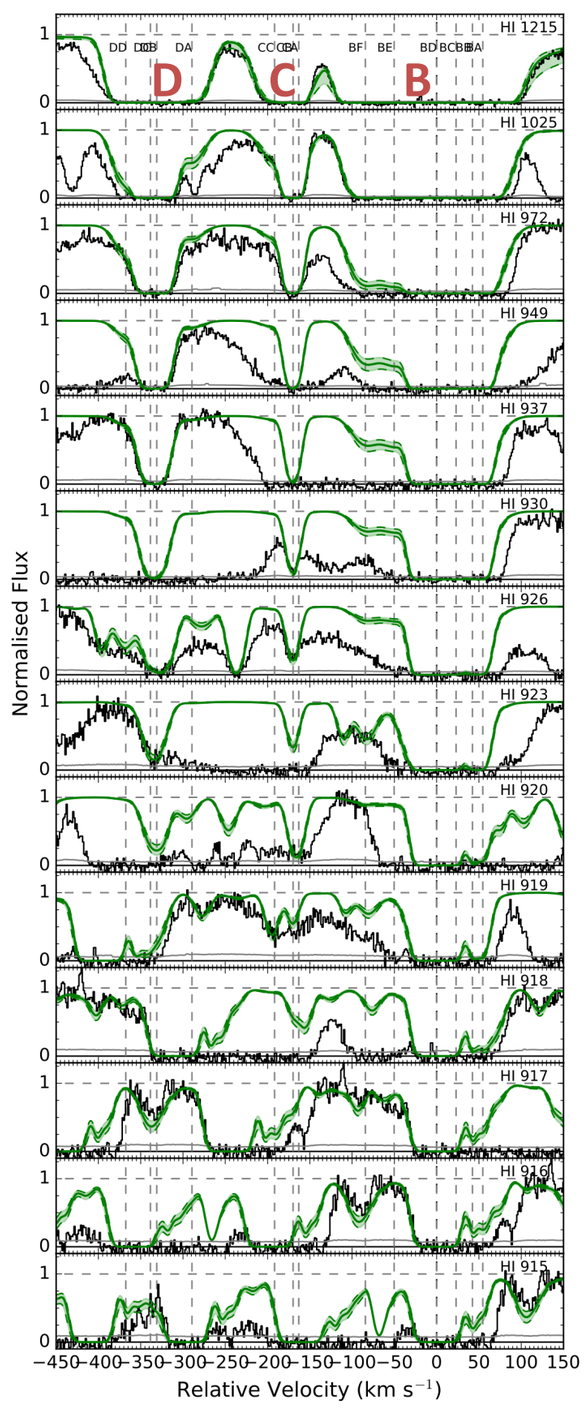


Figure 1: The Keck/HIRES spectrum of the afterglow of GRB 080810 showing its very high signal-to-noise ratio and resolution. Marked are absorption lines from systems at the host redshift (red) and from the intervening line of sight (blue). Particularly noticeable is the lack of a damped Lyman-alpha feature, and a dense Lyman-alpha forest.



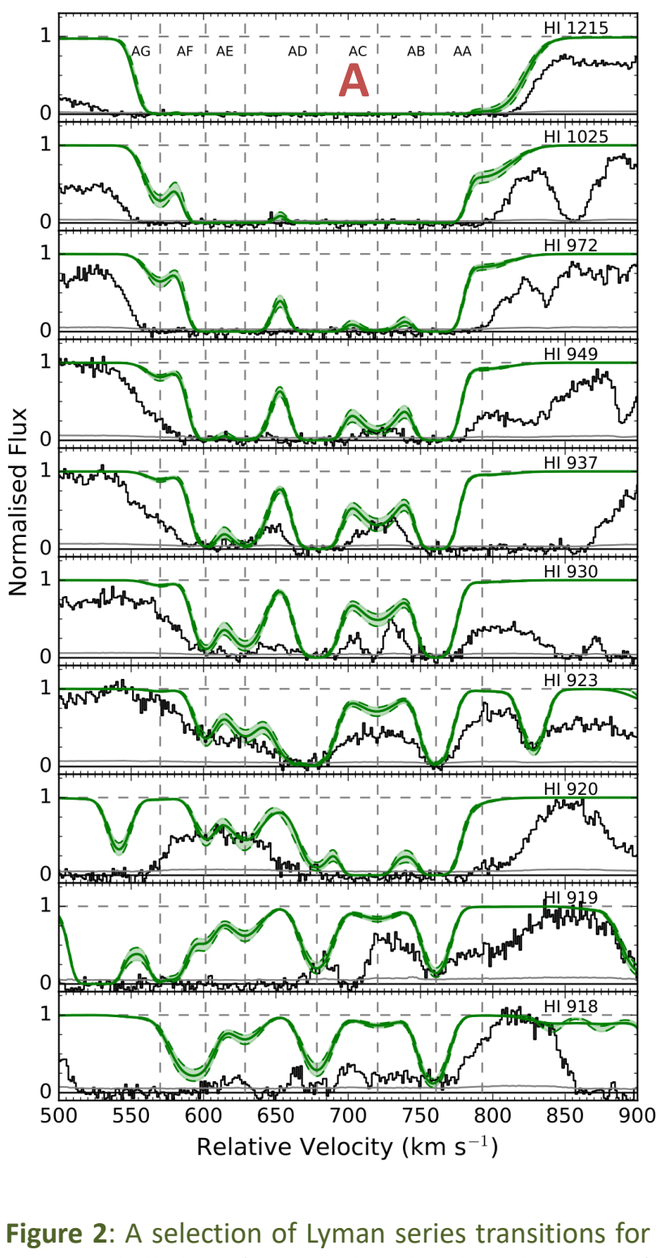


Figure 2: A selection of Lyman series transitions for systems D, C, B, and A at z = 3.346, 3.348, 3.351, and 3.362 respectively. The green line represents the limits/results of fits to the absorption. The shaded region represents 0.3 dex uncertainty.

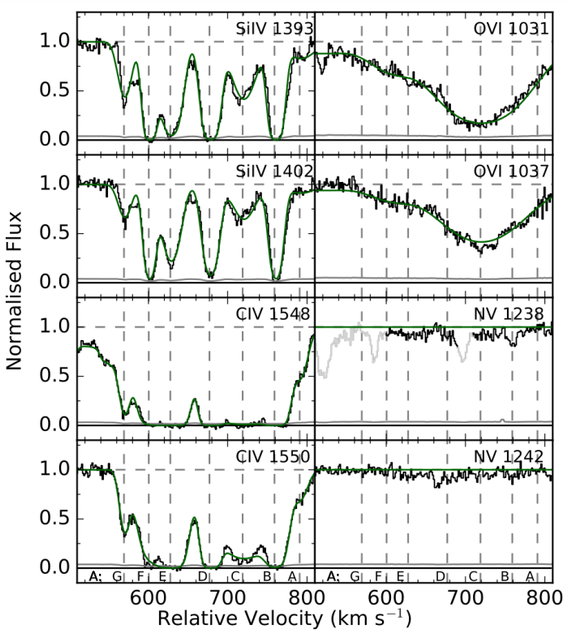


Figure 3: System A

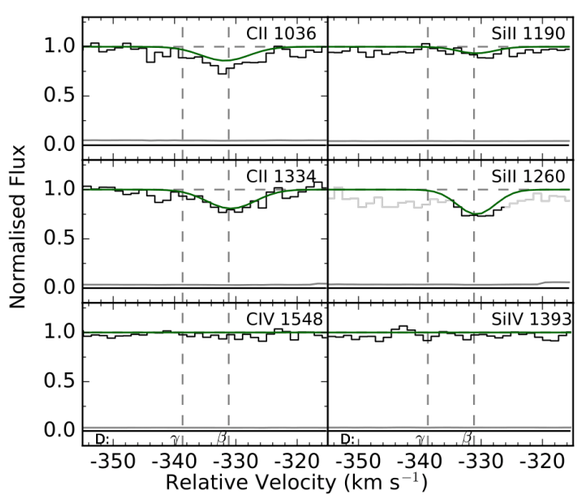


Figure 4: System D

Figs. 3, 4, 5, 6:
A selection of Voigt-profile fits to absorption lines from systems at the host redshift.

3) Strong low-ion and fine structure absorption close to the GRB
4) The extremely metal poor system D which may represent an accretion flow
5) The turbulent, ionised CGM of the foreground galaxy
6) A cartoon showing the likely geometry of the system based on absorption and emission data

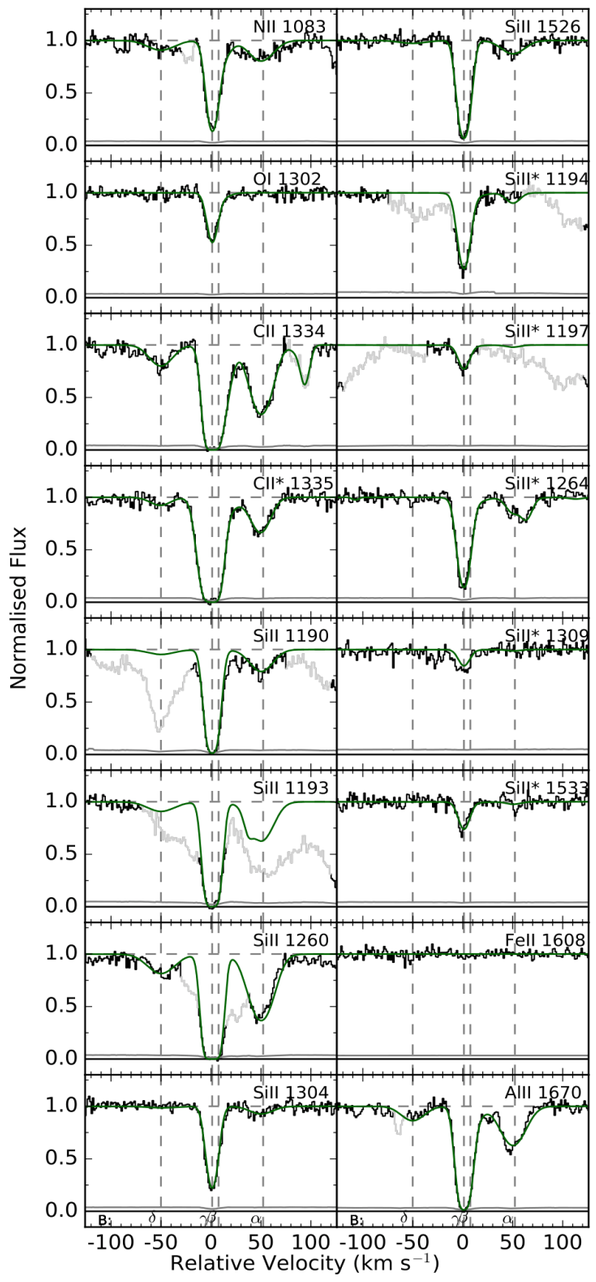
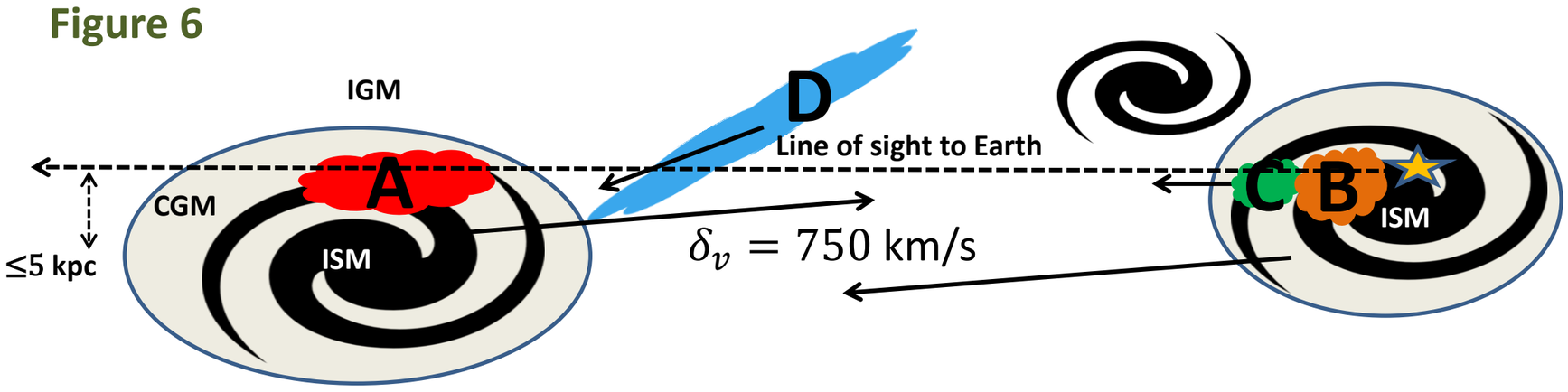


Figure 5: System B

Figure 6



https://arxiv.org/abs/1705.01543