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GRBs vs. quasars: probing reionization vs. halo masses

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**GRBs versus Quasars: Lyman-alpha Signatures of
Reionization versus Cosmological Infall**

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Abstract Lyman-alpha absorption is a prominent cosmological tool for probing both galactic halos and the intergalactic medium at high redshift. We consider a variety of sources that can be used as the Lyman-alpha emitters for this purpose. We first review our recent demonstration, carried out on two distant quasars, of how to measure the mass of the surrounding dark matter halo based on absorption by infalling hydrogen. We then illustrate how similar measurements on large numbers of quasars will probe the evolution of massive halos. On the other hand, we argue that gamma-ray bursts represent the cleanest sources for studying the reionization of the intergalactic medium.