

X42a **Probing cosmic re-ionization with gamma ray burst 130606A at $z \sim 5.91$**

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Understanding the cosmic re-ionization is one of the key goals of the modern observational cosmology. The bright UV continuum of high-redshift QSOs have been used as a background light source to probe the cosmic re-ionization since it is absorbed by neutral hydrogen. However, the original QSO continuum was difficult to be fit, and thus have been the largest source of uncertainty. We present the first gamma ray burst used for Gunn-Peterson re-ionization test. With one of the quickest follow-up observation using VLT/X-shooter, we obtained high S/N spectrum of a gamma ray burst 130606A. Our measurements have much smaller uncertainty than QSOs because of relatively flat, and simple synchrotron emission continuum of GRB afterglows.