Exploratory Chandra Observations of the Highest-Redshift Quasars

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Abstract

We report exploratory *Chandra* observations of 10 high-redshift (z=4.06–5.27), optically selected quasars. Seven of these quasars are detected, increasing the number of $z > 4$ X–ray detected quasars by 50%. Our detections include four of the five highest-redshift X–ray detected quasars to date, among them SDSSp J021043.17−001818.4, the highest-redshift ($z = 4.77$) radio-loud quasar detected in the X–ray band. The three undetected objects are the Broad Absorption Line quasar SDSSp J112956.10−014212.4, the weak emission-line quasar SDSSp J153259.96−003944.1, and the quasar PSS 1435+3057. A comparison of the quasars' spectral energy distributions (by means of the optical-to-X-ray spectral index, $\alpha_{\rm ox}$) with those of lower-redshift samples indicates that the *Chandra* quasars are X–ray fainter by a factor $\approx$ 2. X–ray faintness could be associated with the presence of large amounts of gas in the primeval galaxies harboring these high-redshift quasars. This suggested scenario would be consistent with recent studies conducted on $z > 4$ quasars in other bands. Using the current *Chandra* data, predictions for the next generation of X–ray observatories, *Constellation-X* and *XEUS*, are also provided.

CATEGORY: ACTIVE GALAXIES AND QUASARS