

ScholarWorks@UMass Amherst

ASTRONOMY DEPARTMENT FACULTY PUBLICATION SERIES

Title

X-RAYING THE INTERGALACTIC O VI ABSORBERS

Authors

Y Yao
TM Tripp
QD Wang, *University of Massachusetts - Amherst Follow*
CW Danforth
CR Canizares
JM Shull
HL Marshall
L Song

Publication Date

2009

Journal or Book Title

ASTROPHYSICAL JOURNAL

Abstract

The observed intergalactic O VI absorbers at $z > 0$ have been regarded as a significant reservoir of the "missing baryons." However, to fully understand how these absorbers contribute to the baryon inventory, it is crucial to determine whether the systems are collisionally ionized or photoionized (or both). Using the identified intergalactic O VI absorbers as tracers, we search for the corresponding X-ray absorption lines, which are useful for finding the missing baryons and for revealing the nature of the O VI absorbers. Stacking the *Chandra* grating spectra along six AGN sight lines, we obtain three spectra with signal-to-noise ratios of 32, 28, and 10 per 12.5 mÅ spectral bin around the expected O VII K α wavelength. These spectra correspond to O VI absorbers with various dynamic properties. We find no detectable Ne IX, O VII, O VIII, N VII, or C VI absorption lines in the spectra, but the high counting statistics allows us to obtain firm upper limits on the corresponding ionic column densities (in particular on average at the 95% confidence level). Jointly analyzing these nondetected X-ray lines with the averaged O VI column density, we further limit the average temperature of the O VI-bearing gas to be $T \sim 10^{5.7}$ K in collisional ionization equilibrium. We discuss the implications of these results for physical properties of the

putative warm-hot intergalactic medium and its detection in future X-ray observations.

DOI

10.1088/0004-637X/697/2/1784

Comments

This is the pre-published version harvested from ArXiv. The published version is located at <http://iopscience.iop.org/0004-637X/697/2/1784/>

Volume

697

Pages

1784-1792

Issue

2

Recommended Citation

Yao, Y; Tripp, TM; Wang, QD; Danforth, CW; Canizares, CR; Shull, JM; Marshall, HL; and Song, L, "X-RAYING THE INTERGALACTIC O VI ABSORBERS" (2009). *ASTROPHYSICAL JOURNAL*. 709.

[10.1088/0004-637X/697/2/1784](https://doi.org/10.1088/0004-637X/697/2/1784)

[Download](#)

DOWNLOADS

Since January 21, 2011

Included in

Astrophysics and Astronomy Commons

Share

COinS