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High metal content of highly accreting quasars

We present an analysis of 23 quasar UV spectra believed to belong to extreme Population A (xA) quasars, aimed at the estimation of the chemical abundances of the broad line emitting gas. Metallicity estimates for the broad line emitting gas of quasars are subject to a number of caveats, although present data suggest the possibility of an increase along the quasar main sequence along with prominence of optical FeII emission. Extreme Population A sources offer several advantages with respect to the quasar general population, as their optical and UV emission lines can be interpreted as the sum of a low-ionization component roughly at quasar rest frame (from virialized gas), plus a blueshifted excess (a disk wind), in different physical conditions. Capitalizing on these results, we analyze the component at rest frame and the blueshifted one, exploiting the dependence on metallicity Z of several intensity line ratios. We find that the validity of intensity line ratios as metallicity indicators depends on the physical conditions. We apply the measured diagnostic ratios to estimate the physical properties of sources (for Broad and Blue components) such as density, ionization, and metallicity of the gas. Our results confirm the existence of two regions in different physical conditions, and suggest metallicity values that are high, and probably the highest along the quasar main sequence, with $Z > 10Z_{\odot}$.

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