

QUASAR EMISSION LINES AS VIRIAL LUMINOSITY ESTIMATORS

**P. Marziani¹, E. Bon², N. Bon², M. D’Onofrio³, A. del Olmo⁴,
C. A. Negrete⁵ and D. Dultzin⁵**

¹*National Institute for Astrophysics (INAF), Padua Astronomical Observatory,
Padua, Italy*

²*Astronomical Observatory, Volgina 7, 11060 Belgrade 38, Serbia*

³*University of Padua, Department of Physics and Astronomy “Galileo Galilei”,
Padua, Italy*

⁴*Instituto de Astrofísica de Andalucía (IAA-CSIC), Granada, Spain*

⁵*Instituto de Astronomía, UNAM, Mexico*

*E-mail: paola.marziani@inaf.it, ebon@aob.rs, nbon@aob.rs, mauro.donofrio@unipd.it,
chony@iaa.es, alenka@astro.unam.mx, deborah@astro.unam.mx*

Quasars accreting matter at very high rates (known as extreme Population A [xA]) may provide a new class of distance indicators covering cosmic epochs from present day up to less than 1 Gyr from the Big Bang. We report on the developments of a method that is based on “virial luminosity” estimates from measurements of emission line widths of xA quasars. The approach is conceptually equivalent to the virial estimates based on early and late type galaxies. The main issues related to the cosmological application of luminosity estimates from xA quasar line widths are the identification of proper emission lines whose broadening is predominantly virial over a wide range of luminosity, and the assessment of the effect of the emitting region orientation with respect to the line of sight. We report on recent developments concerning the use of the AlIII λ 1860 intermediate ionisation line and of the Hydrogen Balmer line H β as “virial broadening estimators.”