

Quasars as standard candles

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A remarkable observational property of optically selected, blue quasars is the tight non-linear relation between their X-ray and UV emission. Since no complete physical model is available to explain such relation, a reliable derivation of distances based on its non-linearity requires a complete and careful analysis of the sample properties, in order to rule out systematic effects such as (a) a physical redshift evolution of the relation, (b) sample selection biases, (c) incorrect flux measurements (for example, due to dust extinction). I present the latest results on this project, in particular showing that the X-ray and optical-UV properties of our sample do not show any redshift dependence, and that all the observed dispersion of the relation is explained by residual “external” effects, such as the distribution of disk inclinations and variability. Finally, I show that the observational analysis of this relation is the only way to test its reliability, while any method involving statistical fits and/or comparisons with cosmological models is intrinsically flawed.

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