XMM-Newton observations of the variable ultrasoft AGN REJ2248-511

R. L. C. Starling & E. M. Puchnarewicz
Mullard Space Science Laboratory, UCL, Holmbury St. Mary, Dorking, Surrey RH5 6NT, UK

Abstract

Ultrasoft AGN have low velocity ($\leq$2000 kms^{-1}) broad line clouds and high variability characteristic of NLS1's. REJ2248-511 is also an ultrasoft AGN, but its broad lines have FWHM approx. 3000 kms^{-1} more typical of a normal Seyfert 1 galaxy. This is the only ultrasoft AGN which does not appear to follow the otherwise eunanymous trend.

Previous observations in the optical, EUV and X-ray have shown that this EUV-bright AGN is highly variable across the entire observed spectrum. Here we present the results of the recent *XMM-Newton* observation. The X-ray continuum consists of a variable ultrasoft excess superimposed on a hard power law. Between the *ROSAT* and *ASCA* observations the ultrasoft component completely disappeared and now we find that it has returned. While we know that the soft X-ray spectrum shows large amplitude variability on timescales of a few years at most, the hard power law remains relatively stable between the *ASCA* and *XMM* observations.

We also present near-simultaneous optical spectrophotometry and IR photometry to constrain the multiwavelength spectral shape. Previous optical spectra showed that the continuum slope decreased dramatically becoming much redder in a one year period, indicating a change in strength of the big blue bump with no change in the BLR line strengths and velocities. Eight years on from the last observation we find the optical continuum slope rises toward the blue once more, as measured in 1991, with no marked change in the line profiles.

As this AGN is unusual among ultrasoft objects REJ2248-511 is an ideal test case which we will use in future work to examine the relationship between the BLR and the incident ionizing continuum. A deeper probe of the 0.3-2.1 keV spectrum has been made with the high resolution *XMM* RGS, simultaneous with the presented EPIC data, to allow identification of spectral lines and complex absorption features. This *XMM* observation was just the first in a series of 3 designed to monitor the variability of the soft X-ray spectrum.

REJ2248-511 is a challenging source to understand; the most unconventional of the ultrasoft sources which are themselves poorly understood. However, with a significant amount of new data still to come the situation for this object looks promising.

CATEGORY: ACTIVE GALAXIES AND QUASARS