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PROBING THE SHALLOWING BLR RESPONSE TO OPTICAL CONTINUUM IN AGN

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Active galactic nuclei (AGN) can exhibit significant variability over time. In this study, we investigate the connection between optical continuum variability and the response of broad emission lines, aiming to probe the physical parameters of the broad-line region (BLR) plasma surrounding the supermassive black hole in AGN. Building upon previous research, we explore the relationship between optical continuum variability and the corresponding response of the Hβ emission line. Our goal is to elucidate the saturation effect of BLR luminosity with increasing AGN continuum, commonly referred to as the Pronik-Chuvaev effect. Employing a comprehensive, multi-component simultaneous spectral fitting approach across a range of spectral epochs, we generate continuum and Hβ light curves. Our observations reveal a clear trend of shallowing in the relationship between Hβ and continuum luminosities. To further investigate this trend, we conduct

CLOUDY photoionization simulations, integrating a suitable broadband spectral energy distribution. Exploring a wide parameter space, we model the Hβ emission from the BLR using a constant density, single-cloud model. Our analysis successfully replicates the observed shallowing of the Hβ emission relative to the rising AGN continuum, offering insights into the local BLR densities and the spatial distribution of the Hβ-emitting region.