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Poster

THE LOCATION AND NATURE OF THE Fe II EMITTING REGION IN ACTIVE GALACTIC NUCLEI

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Because of its great strength in AGNs, doubts have been cast over whether Fe II emission is produced by photoionization. We show from reverberation mapping that Fe II emission is clearly produced by photoionization. The self-shielding broad-line region (BLR) model of Gaskell, Klimek & Nazarova (2007, GKN) successfully predicts the ionization stratification of regions producing other broad lines. We have extended the GKN model to include Fe II emission. This predicts that Fe II emission should come from a region with an effective size about twice that producing Hβ and Mg II. This is in agreement with the widths of optical Fe II lines being only about 70% of the widths of broad Hβ. It has been claimed from some reverberation-mapping studies that the responsivity-weighted radius of the gas emitting Fe II is the same as for the gas emitting Hβ, which would imply that they are emitted at similar distances from the black hole. We find, however, that the ratio of radii of the Fe II and Hβ emitting regions found from reverberation mapping is anti-correlated with the quality of the data. This is consistent with known biases in the estimation of lags in reverberation mapping. The highest quality reverberation mapping data show optical Fe II arising from a region twice the size of the Hβ region. This is in agreement both with the predictions of the GKN model and with the relative line widths. We conclude that the Fe II emitting region of AGNs is simply the outermost part of the BLR.