

DISSECTING Fe II LINES IN AGN SPECTRA: REVEALING THE COMPLEX PHYSICS OF THE BROAD-LINE REGION

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ABSTRACT

The iron lines in AGN spectra are crucial for understanding the complex physics of the broad-line region, since these lines exhibit several properties which underlying physics is not well understood.

The location of the Fe II emission region within the AGN structure, atomic processes which lead to unexpectedly strong emission of Fe II and some correlations with other spectral properties, still remain the open questions. In order to investigate these issues, we used a large sample of the AGN Type 1 spectra from SDSS and we modeled the Fe II emission using a flexible Fe II template, that decomposes the optical Fe II emission into several line groups and components. In this way, we were able to trace the behavior of different Fe II line groups across sources with diverse spectral properties. Our results imply that an increased Eddington ratio may modify the broad line region structure, leading to specific physical conditions which may be responsible for emission of the additional Fe II components. This causes an enhancement of the optical Fe II emission, and consequently leads to some of the observed correlations, as quasar main sequence.