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Fantastic fits of AGN spectra with FANTASY: case-study of SDSS-RM spectra

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We present a new tool FANTASY (Fully Automated pythoN Tool for Agn Spectral analYsis) for multicomponent fitting of active galactic nuclei (AGN) spectra in the optical and near infrared wavelength band. Spectra are modeled by simultaneously fitting the underlying broken power-law continuum, predefined emission line (narrow, broad, coronal, etc.) lists, and an Fe II model, which is here extended to cover the wavelength range from 3700 to 11000Å. The Fe II model, founded solely on atomic data, effectively describes the strong emission of the complex iron ion in the vicinity of the $H\gamma$ and $H\beta$ lines, but also near the $H\alpha$ line. Here we present a case study of the application of FANTASY code on SDSS-RM spectra with $S/N > 20$, with the aim to study the variability properties of Balmer lines, as well as of Fe II emission. One interesting finding is that when Fe II emission is present near $H\beta$, it is also detected redward from $H\alpha$, potentially contaminating the broad $H\alpha$ line wings. We show that the FANTASY code is well optimised for bulk fitting of AGN type 1 spectra from SDSS, as it is flexible and easy to use, thus showing great potential for AGN spectral analysis in the coming spectral surveys.

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