

Invited lecture

DOUBLE-PEAKED EMISSION LINES AS A PROBE OF THE BROAD-LINE REGIONS OF ACTIVE GALACTIC NUCLEI

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Broad, double-peaked, Balmer emission lines are found in the optical spectra of a relatively small fraction of active galactic nuclei. They can be an extremely useful diagnostic for the structure and dynamics of the "broad line region" (the medium that emits the broad emission lines). In general terms the rarity and shapes of their profiles provide strong constraints on universal models of the broad-line region. A series of observational tests and basic physical considerations suggest that these lines are emitted from a flat, rotating disk, very likely the outer parts of the accretion disk that fuels the black hole. In the context of models for accretion disk winds, double-peaked emission lines originate in disks with feeble winds of low optical depth, therefore, they provide evidence that the outer accretion disk and its associated wind are the source of the broad emission lines. Within this framework, double-peaked Balmer emission lines and corresponding high-ionization lines in the near-ultraviolet allow us to study the conditions under which the winds become dense and the onset of significant outflows. Moreover, double-peaked emission lines give us a direct view of the dense material of the disk proper and allow us to study dynamical perturbations and other transient behavior through the long-term variability of their profiles.