**Active and Passive Balmer-α Measurements in Magnetic Confinement Experiments**

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Spectrally resolved Balmer-α measurements offer a plethora of information about magnetically confined plasmas that can be used to provide profiles of the bulk main-ion properties (temperature, rotation, density), hydrogenic isotope fractions in mixed isotope plasmas, and details about the fast ions and neutral energy distribution. In addition the spectrally resolved Stark split beam emission can be used to characterize the neutral beam injector energy fractions, provide information about |B| and the bootstrap current, and assist in aligning ion and electron pedestal profiles. Whether an operating neutral beam injector is viewable (active vs passive measurements) determines which measurements are possible at a particular time along with the location of the measurement. For example, information on the bulk ions is available when a neutral beam injector in the line of sight is on (active) while neutral energy distribution information is available when it is off (passive). While a large number of measurements are possible, they are not simultaneously available and interpretation can be challenging due to atomic physics effects that can distort the measurements, and the complexity of multiple overlapping features in the spectrum. Despite these challenges, significant progress has been made using collisional radiative modeling to correct the measurements and comprehensive models to fit the spectrum, allowing these measurements to form the cornerstone of a variety of physics investigations. An overview of the measurements available from the Balmer-α spectrum along with the challenges associated with atomic physics corrections and fitting the spectrum will be presented with a focus on their application at DIII-D as well as other tokamaks and stellarators.

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