Abstract Submitted
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Experimental Measurements of the Dynamic Electric Field Topology Associated with Magnetized RF Sheaths[1] ELIJAH MARTIN, North Carolina State University, JOHN CAUGHMAN, Oak Ridge National Laboratory, STEVEN SHANNON, North Carolina State University, CHRISTOPHER KLEPPER, RALPH ISLER, Oak Ridge National Laboratory — The dynamic Stark effect is a phenomenon in which photon(s) associated with an oscillating electric field are absorbed or emitted with the photon associated with an electronic transition. This multiphoton process leads to the formation of satellites in the spectrum at integer multiples of the frequency associated with the dynamic electric field. Utilizing the dynamic Stark effect the electric field parameters can be determined from the time-averaged and phase resolved emission spectra. Currently two methods are available to calculate the emission spectrum associated with an atomic system in the presence of a dynamic electric field: the quasi-static method and the Floquet method. The methodology and applicability of the quasi-static and Floquet methods will be discussed. The RF sheath electric field parameters are determined, utilizing a generalized dynamic Stark effect model and a novel line shape analysis package, from the time-averaged and phase resolved optical emission spectra. Results will be presented for working gases of hydrogen and helium.

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