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Semi-empirical Numerical Model of RF-driven Nitrogen Discharge. ALEXANDER HYDE, OLEG BATISHCHEV, Northeastern University — Nitrogen discharges are broadly used in science and technology, as N2 is the primary atmospheric gas and the base of many important chemicals due to its strong covalent bond. We report on the development of a power-mass balance model of an axysymmetrical RF discharge [1-2] that takes into account the dominant physical processes: axial and radial transport, gas ionization and excitation, wall loses, etc. Being a molecular gas, it brings additional complexity to a robust numerical model. We include emission from several of the strongest systems that we have detected in experiment: 1st and 2nd positive, 1st negative and Lyman–Birge–Hopfield. [1] A. Hyde, Andrew S. Taylor, and Oleg V. Batishchev, IEEE Transactions on Plasma Science, 46(2):395–405, February 2018. [2] A. Hyde and O. Batishchev, Plasma Medicine, 8(1): 45–55, 2018.

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