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Ionization wave chaos in a glow discharge plasma[1] RALPH B. WILSON IV, NIRMOL K. PODDER, ANASTASIA V. TARASOVA, Troy University, Troy, AL — The temporal dynamics of self-excited ionization waves in an argon plasma is investigated through the use of high voltage electrical probes and Langmuir probes. The fluctuations in floating potentials and ion saturation currents are measured at a fast sampling rate. From these fluctuations, phase space trajectories are reconstructed using various embedding dimensions and time delay parameters. Various chaos identifying parameters, such as correlation dimension and Lyapunov exponent are computed. A detailed analysis of these parameters over a range of plasma conditions is used to determine any interdependence, and thus a means for controlling chaos in the plasma.

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