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Data-Driven Global Model for Low-Temperature Plasma Dynamics[1] CHRISTINE GREVE, MANORANJAN MAJJI, Texas AM University, KENTARO HARA, Stanford University — Plasma reactions have been studied experimentally and computationally to better understand the behavior of plasma. Zero-dimensional, global models can include an array of ground, excited, and ionized states of various gas species. This work uses a physically-informed extended Kalman filter coupled with a global model to estimate plasma properties and reaction rate coefficients. The filter uses a predictor-corrector scheme to update the computational estimate as measurement data are acquired in time to better inform the physics-based model as the system evolves. This method is applied to plasma oscillations in a Hall effect thruster to estimate plasma properties using the discharge current oscillation data from measurements. The applications to other low-temperature plasma phenomena will be discussed.

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