

## Fluid code modelling of pulsed power magnetrons

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Pulsed magnetron systems are widely used in industry, principally for the deposition of thin films and coatings. Strong, nonlinear, inter-dependance of the plasma parameters and the electric and magnetic fields limits the applicability and utility of analytical analysis. A numerical two-fluid model is developed comprising of electron and ion continuity equations, electron drift-diffusion equation, ion momentum equation, the electron energy equation and Poisson's equation for the electric field. Semi-implicit solution of the electron transport equations along with Poisson's equation allows for the strong inter-dependance of the two equation sets. Low relative ion mobility allows for an explicit solution of the ion transport equations. Indirect dependance of the electron energy equation on the electric field allows an explicit solution of the energy equation. This model is applied to the pulsed magnetron system and comparisons drawn with a freely available PIC (Particle-In-Cell)<sup>4</sup> code.

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