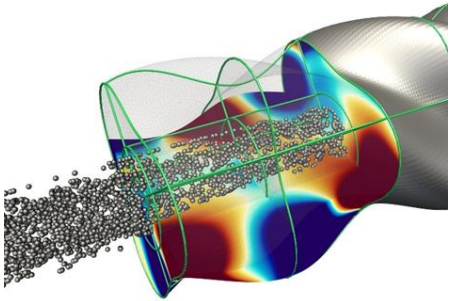
Simulation of plasma dynamics and electromagnetics

Reference: TD-DE-1019

TECHNOLOGY DESCRIPTION

Many high-tech terrestrial processes that use vacuum conditions, plasma and laser-plasma interactions are still not well understood. The numerical simulations offered as a service are intended to provide vacuum coating companies and semiconductor manufacturers with useful insights into the physical details of plasma dynamics. This helps them to improve their product development and to optimise the working parameters of their equipment.



INNOVATIVE ASPECTS

The innovative approach is the coupling of two well-established particle methods Particle-in-Cell and Direct Simulation Monte Carlo. While the former is used to simulate the interaction between charged particles and electromagnetic forces in free molecular flow, the latter is employed to model rarefied gas flows including the exchange of internal energies and chemical reactions. Both methods have been verified and validated for a multitude of applications such as atmospheric re-entry, electric propulsion systems, gyrotrons, and travelling wave tubes.

TECHNOLOGY READINESS (in space application)

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COUNTRY OF ORIGIN

Germany

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TAGS #simulation #plasma #dynamics #e-magnetics #vacuum #coating

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