

PL0006

Diagnostics for pulsed depositing plasmasJames Bradley¹¹University of Liverpool, Liverpool, United Kingdom

j.w.bradley@liv.ac.uk

Over the last 20 years, pulsed magnetron sputtering in the mid-frequency range (20-350 kHz) has become a valuable industrial technique for the deposition of engineering quality thin films and coatings, including dielectric materials. Recent developments in pulsed-magnetron technology include the exciting area of HIPIMS, which operates at low frequency (50-500 Hz) but with ultra-high powers applied to the discharge.

In this presentation, we will review many of the plasma diagnostic techniques (both electrical and optical) currently used to measure and monitor the plasma parameters in these pulse-modulated devices (including HIPIMS). Interesting physical phenomena discovered so far, such as hot electron creation, anomalous charged particle transport and moving structures in the plasma will be highlighted. Some of the pit falls and problems of using electrical probes and analysers in these discharges with the fast changing voltage waveforms and therefore highly modulated plasma parameters will be discussed.

Keywords

pulsed magnetron
diagnostics
optical and electrical
HIPIMS
sputtering