Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Monte Carlo simulations of electron transport for electron beam-induced deposition of nanostructures FRANCESC SALVAT-PUJOL, HARALD O. JESCHKE, ROSER VALENTI, Institut für Theoretische Physik, Goethe-Unversität Frankfurt, Max-von-Laue-Str. 1, 60438 Frankfurt, Germany — Tungsten hexacarbonyl, $W(CO)_6$, is a particularly interesting precursor molecule for electron beam-induced deposition of nanoparticles, since it yields deposits whose electronic properties can be tuned from metallic to insulating. However, the growth of tungsten nanostructures poses experimental difficulties: the metal content of the nanostructure is variable. Furthermore, fluctuations in the tungsten content of the deposits seem to trigger the growth of the nanostructure. Monte Carlo simulations of electron transport have been carried out with the radiation-transport code Penelope in order to study the charge and energy deposition of the electron beam in the deposit and in the substrate. These simulations allow us to examine the conditions under which nanostructure growth takes place and to highlight the relevant parameters in the process.

Harald O. Jeschke
Institut für Theoretische Physik, Goethe-Unversität Frankfurt,
Max-von-Laue-Str. 1, 60438 Frankfurt, Germany

Date submitted: 27 Nov 2012 Electronic form version 1.4