Numerical Simulation of Cold Dense Plasma Sputtering with VORPAL CHUANDONG ZHOU, PETER STOLTZ, SETH VEITZER, Tech-X Corporation — Sputtering is an evaporation process that physically removes atoms from a solid target material. This process takes place under bombardment of the target surface by energetic ions. Sputtering is widely applied in material processing and coating, such as etching and thin film deposition. Numerical simulation of sputtering process requires both accurate models of nuclear stopping in materials, particle dynamics and consistent electromagnetic fields. The particle in cell code VORPAL can simulate cold dense plasma under many different electromagnetic configurations. The dynamics of both incident particles and sputtered neutral atoms are simulated in VORPAL, and the sputtering yield is calculated from a standalone numerical library for a variety of materials that are commonly used in industrial applications. Numerical simulation of the spatial distribution of sputtering resulting from a cold dense plasma under externally applied magnetic field and self-consistent electric field is presented.

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