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Simulation of ablation cloud shielding effects on Tungsten dust transport in edge plasmas R.J. HAJJAR, R.D. SMIRNOV, S.I. KRASHENINNIKOV, A.Y. PIGAROV, UCSD, E.D. MARENKOV, MEPhI, T.D. ROGNLIEN, LLNL — Significant amount of dust are expected to be produced during plasma/PFCs interactions in next generation tokamaks. To study dust transport in tokamaks, numerical codes such as DUSTT, were developed using plasma-dust interaction models based on OML theory. However in high temperature plasmas, dust grains are always surrounded by dust material vapor cloud, which when dense enough can alter the dust-plasma interactions for grain radii larger than $\sim$ 1-10μm depending on plasma parameters. This reduces the grain ablation rate and extends its lifetime and penetration towards the plasma core as compared to models neglecting the cloud effects. A new model describing dust shielding effects for high-Z materials is developed and implemented in DUSTT code. This model considers the reduced heat flux to the dust grain in edge plasma, where it is shown to be due to electron heat conduction. In this work, we investigate the vapor induced shielding effects on dust dynamics and transport, as well as its impact on parameters of ITER-like plasma using the modified DUSTT code. Impact of the shielding effects on the maximum tolerable amount of tungsten dust produced in ITER is investigated. The simulation results are also compared to those previously obtained using an *ad hoc* dust shielding factor.

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