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**Carbon Atom and Cluster Angular Sputtering Distribution under Low Energy Noble Gas Bombardment**[1] EIDER OYARZABAL, RUSSEL DOERNER, GEORGE TYNAN, UCSD — Energetic particle bombardment of a surface can cause sputtering of both atoms and clusters of atoms. Carbon atom and cluster ($C_2$ and $C_3$) angular sputtering distributions are measured during different noble gases (Xe, Kr, Ar, Ne and He) bombardment from a plasma, with incident ion energy $E_i$ ranging between 75 - 225 eV and having normal incidence. A quadrupole mass spectrometer (QMS) is used to detect the fraction of sputtered neutrals that is ionized in the plasma, and to obtain the angular distribution by changing the angle between the target and the QMS aperture. We observe a clear decrease of the cluster ($C_2$ and $C_3$) to atom sputtering ratio as the incident ion mass decreases. For the higher mass bombarding gases, Xe and Kr, the carbon atom signal is under the detection limit while the $C_2$ and $C_3$ cluster signals are detectable, exhibiting an "under-cosine" angular sputtering distribution with a maximum at around 60 $^\circ$. For the lower mass bombarding gases, Ar, Ne and He, we observe an "under-cosine" angular distribution of the carbon atoms, with the maximum at around 60-75 $^\circ$, 60 $^\circ$ and 45 $^\circ$ respectively, and no detectable carbon cluster signal. The Monte Carlo TRIDYN code is used to compare these results with simulations and to investigate possible cluster emission mechanisms.

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Eider Oyarzabal
UCSD

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