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☐ Theory      ☒ Experiment

**Langmuir Probe Measurements of DC Magnetron Plasma,\*** A. Mezzacappa, *Vassar College*, H.L. Wilkens, A. Nikroo, H.W. Xu, *General Atomics* – DC magnetron sputtering has been used to deposit beryllium in fabrication of shells to be used on ignition experiments on the National Ignition Facility (NIF). The plasma properties of the DC magnetron have profound and critical effects on the structure and hence the properties of the sputtered material. To gain a better understanding of these effects, we have used, a Langmuir probe to measure the properties of a the plasma generated by the magnetron gun used in the sputtering process, performed in an argon background. Floating and plasma potential which affect the adatom energies and their surface mobilities, electron and ion densities, and electron temperature were obtained through analysis of the Langmuir probe signals. Spatial variation of these parameters were also measured near the magnetron gun by scanning a Langmuir probe attached to a linear drive along X and Z directions. The operation parameters such as gun powers, argon pressures, substrate biasing, and a biased DC ring, which can influence the plasma and their effects were also measured. The possible relationships between our finding and the quality of the sputtered material will be discussed.

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