Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Ion extraction optics with tunable ion angular distribution of ribbon beams COSTEL BILOIU, DANIEL DISTASO, CHRISTOPHER CAMPBELL, VIKRAM SINGH, ANTHONY RENAU, Applied Materials, Silicon Systems Group, Varian Semiconductor Equipment — The characteristics of the ion angular distribution (IAD) of an extracted ion beam are determined by the shape, location, and orientation of the plasma meniscus. We describe an electrostatic lens that allows modification of plasma meniscus topology and as a result in situ control of the IAD of extracted ribbon ion beams, i.e., control of ion mean angle and angular spread. The ion extraction optics supposes the use of an electrode immersed in the plasma which is located adjacent to the extraction slit. By electrically biasing the electrode relative to the plasma, the meniscus topology and its orientation relative to the wafer plane can be controlled. Thus, 300 mm wide ribbon ion beams with characteristic mean angle spanning from 0° to 50° and angular spread as low as 4° can be obtained. Ion angular distribution can be tuned in terms of mean angle and angular spread for different ion beam energies and beam currents. In addition, being made of conductive material, the extraction optics is insensitive to the possible conductive deposits resulting from byproducts of ion beam bombardment of the wafer surface.

Costel Biloiu
Applied Materials, Silicon Systems Group, Varian Semiconductor Equipment

Date submitted: 05 Jun 2015 Electronic form version 1.4