

Abstract Submitted  
for the GEC11 Meeting of  
The American Physical Society

**Deposition Step in MEMS Time Multiplexed Etch<sup>1</sup>** LAWRENCE OVERZET, IQBAL SARAF, MATTHEW GOECKNER, University of Texas at Dallas — The deposition step of the Bosch process is examined by first forming standard trenches using a Plasma-Therm DSE-II and then depositing on those for an extended time. The deposition profiles at the bottom and sidewalls of trenches provide useful insights into the physical processes driving deposition process. SEMs reveal a dense film at the top and bottom of the trench as expected; however, it has an isolated fiber structure (like blades of grass) along sidewalls. This sidewall “film” structure is independent of the reactor used to deposit, is not caused by the original sidewall scallops, and is not affected by an air break between trench formation and deposition. It is critically dependent upon the ion flux and energy. Our model shows that neutral flux alone cannot form such a deposit inside trenches. This indicates that the deposition step can be highly ion-enhanced and suggests that one reduce the ion flux during Bosch deposition steps to limit the deposition rate at the bottom of the trench/via and thereby increase the etch rate as well as prevent feature closing.

<sup>1</sup>Acknowledgement: This material is based upon work supported by the SRC under award number 2008-KJ-1831.

Iqbal Saraf  
University of Texas at Dallas

Date submitted: 14 Jul 2011

Electronic form version 1.4