

Abstract Submitted
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Laser Ablation Plasma Deposition and Ion Implantation of Hafnium and Hafnium-Oxide Thin Films*¹ NICHOLAS M. JORDAN, RON GILGENBACH, MICHAEL JONES, LUMIN WANG, SHA ZHU, MICHAEL ATZMON, DONGCHAN JANG, Y.Y. LAU, NUCLEAR ENG. DEPT., UNIVERSITY OF MICHIGAN, ANN ARBOR, MI 48105 COLLABORATION — Experiments are underway to deposit and implant films of hafnium and hafnium-oxide on silicon substrates. A KrF laser (400 mJ @ 248 nm) ablates solid Hf foils or sintered pellets of hafnium-oxide. Silicon substrates can be negatively biased (either pulsed or DC) by voltages up to 10 kV for ion implantation. Ablation plasma plumes are characterized by optical emission spectroscopy, dye laser resonance absorption photography, resonant/non-resonant interferometry, and Langmuir probe diagnostics. Composition and morphology of deposited films are analyzed by Scanning Electron Microscopy, Transmission Electron Microscopy, X-ray Energy Dispersive Spectroscopy, X-ray Photoelectron Spectroscopy, and Atomic Force Microscopy. Thin film adhesion is also being tested. X-ray diffraction is being used to determine if the Hf films are amorphous or crystalline. Deposition rates are estimated to be on the order of 0.05 nm/pulse at a deposition rate of 20 pulses/s.

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