

Abstract Submitted  
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**Time-Resolved Imaging of a Pulsed DC Magnetron Plasma During the Sputter Deposition of TiO<sub>2</sub> Films**<sup>1</sup> WEIDONG ZHU, JOSE LOPEZ, ABE BELKIND, KURT BECKER, Stevens Institute of Technology, Hoboken, NJ 07030 — Time resolved images of the optical emissions from a pulsed DC magnetron plasma during the sputter deposition of TiO<sub>2</sub> films were taken with a Roper Scientific ICCD camera. The camera was exposed to the discharge for 0.05-0.2 $\mu$ s with 0.05-0.2 $\mu$ s separation between each exposure. At the beginning of the *on-time* when the power is turned on, the discharge initially starts preferentially in the opposing corners of the *race track*. During the rest of the *on-time*, the emission from the straight sections of the *race track* of the magnetron is always slightly stronger than the emission from the two rounded corners of the *race track*. This pattern extends into the start of the *off-time* when the power is turned off. The optical emissions persist for several microseconds into the *off-time*. Spectral filters were used in order to record the temporal behavior of the various emission lines (Ar, O, Ti).

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