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Preparing TLS-Free Magnetron-Sputtered a-Si¹ MATTHEW ABERNATHY², THOMAS METCALF, XIAO LIU, US Naval Research Laboratory, Washington DC — Recent work has shown that e-beam evaporated a-Si films can be grown free of two-level tunneling states (TLS) through control of the substrate temperature during deposition. The decrease in TLS population in the evaporated films has been shown to be highly correlated with increased density of the films. The question remains as to whether the removal is due to the density increases, the deposition technique, or the chemical bonding conditions of silicon. Using magnetron sputtering, we are able to test these first two questions, as the particle energies in magnetron sputtering are significantly different from those in e-beam evaporation and generally result in higher-density films.

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