Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Investigation of Un-reacted, Multi-phase, Solution-Derived Targets for Pulse Laser Deposition (PLD) of High T_c Superconducting $Y_2Ba_4Cu_8O_{16}$ (Y248) In-Situ, Epitaxial Thin Films GRACE YONG, RODNEY DIXON, STEPHEN MONK, VERA SMOLYANINOVA, RAJESWARI KOLAGANI, Towson University — $Y_2Ba_4Cu_8O_{16}$ (Y248) is known to be robust in terms of O stability and is characterized by the absence of twin formation, and no structural phase transitions. It is stable in ambient atmosphere, resisting H_2O (and possibly even CO_2 exposure). These characteristics make Y248 more attractive for several applications of thin film superconductors as compared to $Y_1Ba_2Cu_3O_{7-\delta}$ (Y123). In addition, Y248 is very likely to have a much lower 1/f electrical noise level than Y123. (Electrical noise in Y123 has been shown to arise from mobile O defects). This would be an important advantage, since it has been established that electrical noise is a performance limiting parameter for Y123 devices. Limited past work on Y248 films has shown that a traditional approach to the growth of thin films by PLD that use stoichiometric, fully reacted, single phase targets has not been successful in achieving in-situ, epitaxial Y248 films. Such studies have also indicated the potential for achieving in-situ, epitaxial, PLD Y248 films using an un-reacted, multi-phase, solution-derived target. We will present results of our work towards obtaining high quality, in-situ, epitaxial thin films of Y248 via PLD employing non-traditional targets.

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Date submitted: 11 Nov 2011 Electronic form version 1.4