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Photocrystallization in a-Se films with and without As-Se buffer layers B.A. WEINSTEIN, R.E. TALLMAN, G.P. LINDBERG, Dep. of Physics, Univ. at Buffalo, Buffalo, NY, USA, J.A. ROWLANDS, A. REZNIK, Thunder Bay Regional Resch. Inst., Ontario, Canada, M. KUBOTA, K. TANIOKA, NHK Research Labs, Tokyo, Japan — Photo-induced crystallization is studied for temperatures of 250 - 435 K in amorphous Se (a-Se) HARP* imaging targets using Raman spectroscopy to detect the appearance and growth-rate of trigonal Se in these thin-film structures. We observe striking differences between HARP films in which a thin buffer layer of As-Se alloy is, or is not, deposited prior to growth of the principal a-Se photoconductive layer. Films containing an As-Se buffer appear to be much more stable; no photocrystallization is found within the temperature range studied, even after 3.5 hours of laser exposure ($0.17 W/mm^2$ at 647nm). Whereas for films with no As-Se buffer, photocrystallization readily occurs in two temperature regimes below and above the a-Se glass transition (Tg $\sim$310K), and there is a regime in the neighborhood of Tg where photocrystallization is absent. We discuss these results in terms of a polymerization model under the competing effects of shear-strain at the substrate and As-cross-linking in the buffer layer, which, respectively, tend to promote and inhibit crystallization in the thick Se over-layer. **High-gain Avalanche Rushing Photodetector.*

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