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Ellipsometric Analysis of Silicon Nanoparticles Formed by Rapid Thermal Annealing[1] CHAD WAXLER, GREGORY SPENCER, ANUP BANDYOPADHYAY, Texas State University-San Marcos — Since the discovery of visible photoluminescence (PL) of silicon nanostructures, interests in silicon nanoparticles has increased due to their possible applications in photovoltaics and optoelectronic devices. In this study, we investigate the surface morphology and optical properties of silicon nanoparticles formed on a silicon-on-insulator substrate by rapid thermal annealing in an argon environment at atmospheric pressure. We analyze the formation of silicon nanoparticles as a function of silicon layer thickness (3-10 nm), annealing temperature (600-800° C), and annealing duration (30-120 seconds) using atomic force microscopy (AFM) and we analyze the optical properties via effective medium approximations (EMA) models using a variable angle spectroscopic ellipsometer (VASE).

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Chad Waxler
Texas State University-San Marcos

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