

Abstract Submitted  
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**Development and Characterization of Dynamic Light Scattering Instrumentation to Determine Nanoparticle Size<sup>1</sup>** THOMAS VOLPE, C. JENSEN, C. DI FATTA, P. MCATEE, M. SCHULZE, S.M. LEV, J.R. SIMPSON, Towson University — Dynamic Light Scattering (DLS) provides a high-throughput and accurate measurement of particle sizes for monodisperse (MD) spherical nanoparticles (NPs). We report on the development and characterization of homebuilt DLS instrumentation to measure the size of MD NPs, including polystyrene, gold, and ZnO NPs. HeNe and Argon-ion lasers comprise the excitation sources for the scattering experiment. We have evaluated an avalanche photodiode detector for the acquisition of the scattered light. Time averaging and time-autocorrelation electronic signal detection and analysis provides a measure of the translational diffusion coefficient, which for MD and spherical particles allows for determination of the NP radius. ZnO NPs will be synthesized using several techniques and compared to those produced commercially. We have characterized our instrumentation by measuring the size of commercially-produced gold and polystyrene in the range of 10 nm to 200 nm and found excellent agreement ( $\pm 5\%$ ) with reported values. The synthesized particles are expected to range in diameter from 200 nm down to 20 nm. After size characterization, the ZnO NPs will be employed in ongoing toxicity studies.

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Thomas Volpe  
Towson University

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