SOCIETY OF PHYSICS STUDENTS (SPS) EVENT

Construction and Testing of a New Setup for Dynamic Light Scattering Spectroscopy

Jessica Schwan
Cleveland State University

When light interacts with small particles in a solution, the phenomenon known as Rayleigh scattering occurs, in which light is re-emitted by the particles in all directions. If the light source is a laser, which is monochromatic and coherent, this allows for the observation of time-dependent fluctuations in the intensity of the scattered light. These fluctuations are due to Brownian motion of molecules in solution and can be used to describe the change in distances between molecules in a solution with time. Dynamic Light Scattering (DLS) is a method for measuring and interpreting the intensity fluctuations of scattered light. In this method, the intensity-intensity correlation function is calculated, which can then be analyzed (for example by cumulants) to give information about particle's diffusion coefficient, hydrodynamic radius, and size distribution. DLS is very advantageous because of the noninvasive, non-distractive, and reproducible nature of this method. Our goal was to design, build, and test a completely new and independent setup for use with lasers of different wavelength and correlators of different resolution. We also designed, wrote, and implemented a program for cumulant analysis of the results. After having assembled the major components of the setup, initial tests of the system determined its effectiveness.

WHERE

SI – 117 (room next to Physics Computer Lab)

WHEN

Noon - 1pm
Tuesday, November 20, 2007