Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Electromagnetically assisted synthesis of highly concentrated gold nanoparticle colloids LAURA HERNANDEZ, WALTER ROSAS, Universidad de Los Andes, GUILLERMO NARANJO, XOMALIN G. PERALTA, University of Texas at San Antonio, WATSON L. VARGAS, Universidad de Los Andes — The synthesis of metallic nanoparticles is currently an extremely active area of research due to the multiple potential applications of nanomaterials to areas ranging from nano-medicine to catalysis. Some of the current challenges of nanoparticle synthesis protocols include synthesizing nanoparticles in high concentrations with a small polydispersity. The present study contrasts and compares the synthesis of highly concentrated colloidal gold using three different sources of electromagnetic radiation to assist the reaction. The first source was a Spectra Physics Mai Tai Ti:Sapphire laser made by Sperian, this laser generates 70 fs FWHM pulses with wavelengths in the range of 690-1040 nm. The second source was sun light; this was measured to have a power of 10W. The third source was a lowelDP lamp with a measured intensity of 25W. Both the solar light and the lamp's rays were concentrated using a 28cm x 28cm Fresnel lens. Results will be presented highlighting differences and similarities in size, shape, crystallinity and time of the reaction. We speculate about the role played by variations in wavelength, temporal profile of the electromagnetic source (pulsed vs. continuous), temperature of the reaction and excitation power in the final structure of the nanoparticles generated.

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Date submitted: 14 Nov 2014 Electronic form version 1.4