

Abstract Submitted  
for the TSF12 Meeting of  
The American Physical Society

**Rare earth doped upconverting nano and micron size particles for photonic applications**<sup>1</sup> MADHAB POKHREL, AJITH KUMAR GANGADHARAN, DHIRAJ KUMAR SARDAR, University of Texas at San Antonio — Upconverting nano and micron size particles are known to exhibit extraordinary characteristics and have a wide range of applications which utilizes their unique properties. A thorough optical characterization of the rare earth doped materials is of critical importance in evaluating them as potential for various photonic applications. My studies include absorption, excitation, emission, and fluorescence lifetime measurements in upconverting powder. Along with the spectroscopic analysis, we have successfully measured the quantum yield for the different concentration of Er/Yb doped  $M_2O_2S$  ( $M=La, Y, Gd$ ). We have found that quantum yield in Er/Yb doped  $M_2O_2S$  is power dependent. Measurements done under the identical condition with respect to reported most efficient upconverting phosphor  $NaYF_4$  doped with Er/Yb show that the new phosphor system is three times more efficient. The high quantum yield under near infrared excitation enables the application of upconverting phosphors as potential candidate for biomedical imaging application. Luminescence measurement shows that present upconverting phosphors system is also powerful candidates for display application.

<sup>1</sup>This research was supported by the National Science Foundation Partnership for Research and Education in Materials (NSF-PREM) Grant No. DMR-0934218.

Madhab Pokhrel  
University of Texas at San Antonio

Date submitted: 21 Sep 2012

Electronic form version 1.4