

**A NON-RADIATIVE METHOD FOR MEASURING DONOR/ACCEPTOR DISTANCES USING PHOTOACOUSTIC CALORIMETRY: PAC-FRET.** William A Maza and Randy W Larsen\*, Department of Chemistry, University of South Florida, SCA 405A, 4202 E. Fowler Ave, Tampa, FL 33620.

Förster resonance energy transfer (FRET), widely used as a method through which to probe conformational dynamics and distances in biological and biomimetic systems, has traditionally been measured using a variety of radiative techniques. In the steady-state these measurements can be complicated by inner-filter effects associated with either the excitation or emitted energy of the donor due to ground-state absorption by the acceptor. In this report, a non-radiative method for measuring FRET between a donor and acceptor is presented using photoacoustic calorimetry, PAC. FRET efficiencies and donor/acceptor distances are measured between the donor (rhodamine B, RB) and acceptor (indigo carmine, IC) with PAC and compared to the same values found by steady-state emission. It was found that at lower concentrations of IC (~24 $\mu$ M) in a 6 $\mu$ M RB solution, the FRET distances measured by steady-state emission and PAC differed by as much as 10%. These differences were observed to decrease at higher IC concentrations to approximately 2%.