

Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Femtosecond Heterodyne Transient Grating Spectroscopic Studies of Intramolecular Charge Transfer Character of Peridinin and Peridinin Analogs¹ MICHAEL BISHOP, SOROUSH KHOSRAVI, RAZIB OBAID, HOPE WHITELOCK, ANN MARIE CARROLL, AMY LAFOUNTAIN, HARRY FRANK, University of Connecticut, WARREN BECK, Michigan State University, GEORGE GIBSON, NORA BERRAH, University of Connecticut — The peridinin chlorophyll-a protein is a light harvesting complex found in several species of dinoflagellates. Peridinin absorbs strongly in the mid-visible spectral region and, despite the lack of a strong permanent dipole moment in its lowest energy excited state, is able to transfer excitation energy quickly and efficiently to chlorophyll-a. It is believed that the high efficiency arises from the development of intramolecular charge-transfer (ICT) character upon photoexcitation. Recently, heterodyne transient grating spectroscopy has been used to study the ultrafast (<50 fs) dynamics of β carotene and peridinin. The studies show evidence for a structurally displaced intermediate in both cases and strong ICT character in the case of peridinin, but up to now the work has not provided appropriate control experiments. The present experiments examine peridinin and two peridinin analogs, S1-peridinin and S2-peridinin. S1-peridinin is reported to have greatly diminished ICT character, and S2-peridinin is reported to have little-or-no ICT character. Heterodyne transient grating data will be presented and provide a more unambiguous characterization spectral and kinetic properties associated with the peridinin ICT state.

¹Funded by the DoE-BES, grant No. DE-SC0012376

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Date submitted: 29 Jan 2016

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