Abstract Submitted
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The Physics of Coherent Anti-Stokes Raman Spectroscopy LASZLO UJJ, Department of Physics, University of West Florida, Pensacola, FL 32514 — Coherent anti-Stokes Raman Spectroscopy (CARS) has been shown to be one of the most powerful experimental methodologies for obtaining vibrational information from both stable and transient molecular species. The general theoretical and experimental principles associated with CARS, together with specific examples of its applications to important molecular systems, are presented. A concise theoretical formalism of CARS, and its electronically resonant variant, is presented with an emphasis on points relevant to the interpretation of experimental spectra. The instrumental components required for obtaining typical CARS data are illustrated in a brief description of a picoseconds and a nanosecond experimental system used to record CARS spectra. The details of the design and operation of an all solid-state broadband nanosecond CARS system will be presented. Specific examples of picosecond CARS data are taken from measurements of stable and transient intermediates comprising the photoreactions of photoactive proteins. Polarization sensitive CARS spectra taken with the nanosecond system are also presented. Finally, an overview of developments in this field to be anticipated is discussed. Reference: Laszlo Ujj and George H. Atkinson, Coherent Anti-Stokes Raman Spectroscopy, in Handbook of Vibrational Spectroscopy, John Wiley and Sons., Ltd., 2002.

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