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Title:	Condensed Phase Vibrational Strong Coupling Induced Modulations on Intermolecular Interactions
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Abstract:	In this dissertation, our primary objective is to examine the impacts of vibrational strong coupling (VSC) on intermolecular interactions such as hydrogen bonding. Our focus lies in analyzing the solvatochromic characteristics of solvent-sensitive probes such as ANS (1,8-Anilnaphthalenesulfonates) in a water-dioxane mixture when subjected to VSC. As the emission properties of such probes are very sensitive to the local solvent environment, we are looking to specifically study what all local intermolecular interactions are indeed getting affected under VSC. The emission response collected under VSC conditions shows a bathochromic shift, indicating that local interactions are perturbed under VSC conditions. ANS is known to exhibit two channel emission-direct and charge transfer channels in the excited state. Our preliminary studies suggest that VSC of water OH vibrational bands may be affecting the local hydrogen bonding networks. Further experiments are required to get more insights into the excited state dynamics that may give solid experimental evidence for VSC-induced changes to intermolecular interactions.
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