THEORETICAL ASPECTS OF PHOTOASSOCIATIVE SPECTROSCOPY

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A discussion is presented of the interpretation of experiments in photoassociative spectroscopy of ultracold atoms. The experiments can be analyzed to yield precise estimates of long-range interactions which reveal the influence of radiative effects and to derive accurate radiative lifetimes of excited atoms. Information can be obtained about the characteristics of the traps in which the ultracold atoms are stored. The theory makes possible the exploration of mechanisms that have been proposed for the preparation of ultracold molecules in specific vibrational and rotational states.