

Interferences in Photodetachment of a Negative Molecular Ion

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Abstract: The photodetachment of a negative molecular ion is studied theoretically using a two-center model. The detached electron wave function is obtained as a superposition of two coherent waves originating from each center. The photo-detached electron flux is evaluated on a screen placed at a large distance from the negative molecular ion. The electron flux on the screen displays strong interferences, the peak positions are related to the distance between the two centers in the negative molecular ion. We also obtained a simple analytical formula for the total photodetachment cross section. It approaches one and two times of the cross section for the one-center system in the high and low photon energy limits respectively.

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Key words: photodetachment, quantum interference

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