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Resonant Coupling in the Heteronulcear Alkali Dimers for Direct Photoassociative Formation of X $^1\Sigma^+$ v"= 0 Ultracold Molecules JAYITA RAYMAJUMDER, MICHAEL BELLOS, RYAN CAROLLO, MATTHEW RECORE, MICHAEL MASTROIANNI, WILLIAM STWALLEY, EDWARD EYLER, PHILLIP GOULD, Department of Physics, University of Connecticut, Storrs CT 06269 — We have studied the resonant coupling between rovibronic levels of different electronic states for the ten heteronuclear alkali dimers formed from combinations of Li, Na, K, Rb, and Cs. We focus on the energy range < 100 cm⁻¹ below the lowest two excited asymptotes, which is relevant for photoassociative molecule formation. Within this range, we concentrate on coupled levels that have good Franck-Condon overlap with the absolute rovibronic ground state, X(v=0, J=0). We will present promising schemes for directly forming ultracold X(0,0) dimers by single-photon photoassociation followed by spontaneous emission, as recently demonstrated for LiCs¹.

¹Deiglmayr, et al., Phys. Rev. Lett. 101, 133004 (2008)

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