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Theory of Alkaline-Earth Photoassociation in a 2D Geometry PASCAL NAIDON, PAUL JULIENNE, Atomic Physics Division, NIST Gaithersburg, ROMAN CIURYLO, Instytut Fisyki, Nicolaus Copernicus University, Torun, TANYA ZELEVINSKY, MARTIN M. BOYD, ANDREW D. LUDLOW, TETSUYA IDO, JUN YE, JILA, NIST Boulder — The narrow intercombination line in alkalineearth species allows weak photoassociation transitions which present novel features with respect to usual photoassociation in cold alkali species. In particular, we show that the line shape is sensitive to the dimensionality of the system. We applied this theory to the JILA photoassociation experiment on 88Sr performed in a 1D optical lattice at the magical wave length. A simple model reproduces the observed molecular energy levels. The model also allows us to predict the 2D thermal line shapes observed in the experiment and calculate the strength of optical Feshbach resonances for this system.

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