

PHOTOASSOCIATION LINE SHAPES IN COLD CALCIUM

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We report on new photoassociation measurements using a dense cloud of calcium atoms at 2 mK. Long range molecular levels of the state B were observed up to 182 GHz below the asymptote $4s4s\ ^1S_0 - 4s4p\ ^1P_1$. Due to experimental improvements, a strongly increased trap loss signal was observed in comparison to previous experiments [Degenhardt *et al.*, *Phys. Rev A* **67**, 043408 (2003)]. This allows for a better interpretation of the observed line shape. From this a new value of the ground state scattering length of Ca can be determined. The new analysis will likely resolve the discrepancy of the scattering lengths reported by Degenhardt *et al.* and Allard *et al.* [*Eur. Phys. J. D* **26**, 155 (2003)].