Abstract Submitted
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Formation of Be_2^+ molecules in the metastable $B^2\Sigma_g^+$ state by ultracold photoassociation SANDIPAN BANERJEE, JASON BYRD, ROBIN CÔTÉ, H MICHELS, JOHN MONTGOMERY, Dept. of Physics, University of Connecticut — We suggest a photoassociation (PA) scheme to form ultracold Be_2^+ molecules in the long-range outer well of the $B^2\Sigma_g^+$ state. In our previous work [1], we have calculated the ground states of Be_2^+ dimer and have analyzed in detail the double well nature of the $B^2\Sigma_g^+$ state. We also note that the vibrational levels in the outer well of the $B^2\Sigma_g^+$ state have significantly longer radiative lifetimes ($\sim$ ms) than the ones in the inner well ($\sim \mu$s). Using similar *ab initio* methods (valence full CI), we have now calculated the excited $^2\Pi_{u/g}$ and $^2\Sigma_{u/g}$ states. For the proposed PA scheme, we populate the $A^2\Pi_u$ state and radiatively decay into the $B^2\Sigma_g^+$ state of Be_2^+. We also calculate transition dipole moment, Frank-Condon factors between the $A^2\Pi_u$ and $B^2\Sigma_g^+$ states.

[1]S. Banerjee *et al.* Chem. Phys. Lett. 496 (2010) 208.

Sandipan Banerjee
Dept. of Physics, University of Connecticut

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