

Abstract Submitted  
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**Ro-vibrational energy spectra for three ions in an isotropic harmonic trap**<sup>1</sup> W. BLAKE LAING, YUJUN WANG, B.D. ESRY, Department of Physics, Kansas State University — We study the three-body physics of bosonic ions in a spherical trap. In particular, we calculate the ro-vibrational energy spectra and the corresponding wavefunctions by solving the three-body Schrödinger equation in the adiabatic hyperspherical representation. These calculations encompass ion trap frequencies and masses found in quantum information experiments and frequency standards studies. By analyzing the wavefunctions, we extract the geometry of these states and make a connection to the well-known Wigner crystal in plasma physics for both zero and non-zero total angular momentum. Finally, we will discuss the importance of quantum effects on the ions' ro-vibrational spectra.

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