Energy and structural properties of N-boson clusters with Efimov character[1] YANGQIAN YAN, D. BLUME, Washington State University — The low-energy spectrum of N-boson clusters with pairwise zero-range interactions is believed to be governed by a three-body parameter. We study the ground state of N-boson clusters with infinite two-body scattering length by performing *ab initio* path-integral Monte Carlo simulations. To prevent Thomas collapse, we choose different three-body regulators. We first compare our results with the zero-range theory at the three-body level. The energy and structural properties of the models considered are in better agreement with the zero-range theory than those of two-body finite-range interaction models. We then calculate the energy of larger clusters and compare with predictions from the literature. Finally, we obtain structural properties and compare with those of two-body finite-range interaction models.

Yangqian Yan
Washington State University

Date submitted: 01 Apr 2015   Electronic form version 1.4