First branch of liquid states of a many-atom Bose system\textsuperscript{1} BO GAO, University of Toledo — We present more detailed properties of the first branch of the liquid states as suggested and studied recently, including the equilibrium density and the equilibrium energy-per-particle of the liquid, speed of phonons, and pair correlation functions. Results are presented both for liquid branches corresponding to negative scattering lengths\textsuperscript{2} and for those corresponding to positive scattering lengths\textsuperscript{3}.

\textsuperscript{1}Supported by NSF