

Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Observations of trapped ions phase transition processes YUZI XU, YUNHAN HOU, WENDING ZHAO, QUANXIN MEI, BOWEN LI, JIANYU MA, Center for Quantum Information, IIS, Tsinghua University, Beijing, 100084, China, XIANG ZHANG, Department of Physics, Renmin University of China, Beijing, 100872, China, ZICHAO ZHOU, LUMING DUAN, Center for Quantum Information, IIS, Tsinghua University, Beijing, 100084, China, TRAPPED IONS QUANTUM COMPUTING LAB TEAM — We directly observed laser-cooled $^{174}\text{Yb}^+$ ions confined in 4-rod Ion trap to study ions crystalline phase, and images of them taken by EM-CCD were used to characterize the structural phase of trapped ions and calculate temperature of each ion. With a variety of perturbations in the beginning, different structural phase transition processes were detected by continuously taking pictures of ions in the experiment. The experiments results are in good agreement with theoretically simulation that show symmetrical and partial temperature-driven structural phase transition for trapped ion crystal and help us understand ions melting phenomenon to increase ions lifetimes in the future.

Yuqi Xu
Center for Quantum Information, IIS, Tsinghua University

Date submitted: 03 Feb 2020

Electronic form version 1.4