

Abstract Submitted  
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**Quantum Monte Carlo Study of Anomalous Excitations in BCC Helium-4** JARON KROGEL, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA, SAAD KHAIRALLAH, Lawrence Livermore National Laboratory, Livermore, CA 94550, USA, DAVID CEPERLEY, Department of Physics, University of Illinois at Urbana-Champaign, Urbana, IL 61801, USA — Crystalline Helium displays an intriguing set of non-classical behavior. In 2002, inelastic neutron scattering experiments<sup>1</sup> revealed anomalous optic-like branches, which were attributed to localized excitations. The nature of these excitations is explored with Correlation Function Quantum Monte Carlo, in which a basis of many-body trial wave functions is projected onto the exact set of excitations. We review the general form of the method, its adaptation to solid Helium, and results for the excitation spectrum. Preliminary results indicate that p-like site excitations can partially recover the spectrum.

<sup>1</sup>T. Markovich, E. Polturak, J. Bossy, and E. Farhi, Phys. Rev. Lett. 88, 195301 (2002)

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