1097-81-393 **Bruno Nachtergaele** (bxn@math.ucdavis.edu), Department of Mathematics, One Shields Avenue, Davis, CA 95616, **Robert Sims*** (rsims@math.arizona.edu), Department of Mathematics, University of Arizona, 617 N. Santa Rita Avenue, Tucson, AZ 85721, and **Gunter Stolz** (stolz@math.uab.edu), Department of Mathematics, Campbell Hall, 1300 University Boulevard, Birmingham, AL 35294. *Localization for Disordered Quantum Harmonic Oscillators.*

We consider quantum harmonic oscillator models with random coefficients. Our goal is to find verifiable signatures of many-body localization in simple systems. Given certain conditions on the effective one-particle Hamiltonian, we prove results on localization of the dynamics and localization in specific states. The result on dynamical localization is expressed in terms of a zero-velocity Lieb-Robinson bound. We also prove exponential decay of correlation functions at both zero and positive temperature, demonstrating a form of localization in the ground state and in thermal states. Finally, we prove an area law for the bipartite entanglement of both the ground state and thermal states, as measured by the logarithmic negativity. The above conditions (on the one-particle Hamiltonian) are satisfied for some standard models that are almost surely gapless in the thermodynamic limit. This is joint work with Bruno Nachtergaele and Gunter Stolz. (Received January 27, 2014)