Optomechanical Description of Dynamical Casimir Effect BELTER E ORDAZ MENDOZA, Univ of Connecticut - Storrs, SUSANNE YELIN, Univ of Connecticut - Storrs / Harvard — We study theoretically the contribution of dynamical Casimir effect (DCE) in optomechanical systems. By considering a one–dimensional optical cavity consisting of one fixed and one movable mirror and performing a second quantization, we represent the quantum states of the cavity field modes coupled to one phonon mode associated with mirror’s motion. Using the Hamiltonian for the interaction between a moving mirror and radiation pressure, we analyze the contribution of resonant and nonresonant terms in this optomechanical setup. By doing a linear stability analysis, we identity the regions of interest and show that the contribution of nonresonant terms are associated with DCE and cannot be neglected. The complete dynamics of this configuration is studied in the master equation approach.