Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Fluctuation Induced Forces for Surface Relief Gratings JEF WAGNER, ROYA ZANDI, University of California Riverside, THORSTEN EMIG, Laboratoire de Physique Theorique et Modeles Statistiques Universite Paris Sud — In 1948 H. G. B. Casimir predicted that two flat parallel neutral perfectly conducting plates would attract each other due to the quantum fluctuations of the electromagnetic field. Since then progress has been made to allow one to calculate the interaction energy due to both quantum and thermal fluctuations between two objects of almost arbitrary shape and material properties. This work focuses on interaction with at least one object described by a surface relief grating. The Casimir energy is calculated using the scattering matrix approach, and the scattering matrix of the periodic surface is calculated using the C method from electromagnetic grating theory. The strengths and limitations of the method with regards to calculating the Casimir energy are discussed, and the results for simple 1-D and 2-D periodic structures are shown.

Jef Wagner
University of California Riverside

Date submitted: 11 Nov 2011 Electronic form version 1.4