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Sum-over-modes approach to the Casimir effect in dissipative systems FRANCESCO INTRAVAIA, RYAN BEHUNIN, Theoretical Division, MS B213, Los Alamos National Laboratory, Los Alamos, NM 87545, USA — We show that, within the open-system framework, the sum-over-modes approach à la Casimir leads to the Lifshitz formula for the Casimir free energy. A general result applicable to arbitrary geometries is obtained through the use of Ford, Lewis, & O'Connell's remarkable formula. Additionally, we address the possibility for obtaining the Casimir energy as a sum over complex "modes." We show in this case that the standard sum-over-modes formula must be suitably generalized to avert unphysical complex energies.

Francesco Intravaia
Theoretical Division, MS B213, Los Alamos National Laboratory,
Los Alamos, NM 87545, USA

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