



CASIMIR FRICTION

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BACKGROUND

Short-range electromagnetic force between neutral objects

Classical interpretation: retarded van der Waals force

Quantum interpretation: vacuum energy fluctuations

Depends on geometry of system

Can be attractive or repulsive

SITUATION BEING INVESTIGATED

Electric dipole in vacuum

Moves with fixed velocity parallel to dielectric slab

Fixed height above slab



CALCULATING THE FORCE (PART 1)

Two contributions:

- Dipole-dipole fluctuations
- Fluctuations in electromagnetic field

Start from classical formulas, then adjust for quantum

CALCULATING THE FORCE (PART 2)

Specialize general formulas to situation being considered:

- Polarizability
- Electromagnetic Green's function

Isolate contributions of different terms in the equation



QUESTIONS?