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**Quantum and Classical Vacuum Forces at Zero  
and Finite Temperature**

In this talk the Casimir-Polder force (retarded particle-wall interacting) at zero temperature and at finite temperatures will be calculated by using the method of image charges. For the calculations at finite temperature KMS-states will be introduced and used for the first time in this context. A one oscillator model for inhomogeneous dispersive absorbing dielectric material will be introduced to calculate the Casimir-Polder force at a dielectric interface at finite temperature. I will then use the same methods to calculate the van der Waals force between two neutral atoms at zero temperature and at finite temperatures. It will be shown that the high temperature behaviour of the Casimir-Polder force and the van der Waals force are independent of  $\hbar$ . This means that they have to be understood classically, what will then be shown in an algebraic statistical theory by using classical KMS states.



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