

Quantum Field Emission Generated Ionic Wind for Electronics Cooling Applications a Round-up

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Abstract

The utilization of the ionic wind effect is a proficient way for many technical problems, such as electronics cooling and enhanced chemical reactions of surfaces. Macroscopic realization of this technique however comes with some severe constraint regarding efficiency, material erosion and unwanted auxiliary chemical reactions. To counteract these constraints one has to understand the coupling between the condensed matter (metal electrodes) and the diluted fluid (ionized gas). This breaks down to such fundamental effects like quantum field emission and piezoelectricity, which can be described with solutions to Schrödingers equation. To connect these phenomena to practical applications the correlation of macroscopic transport properties and fundamental interaction processes (defined by their Hamiltonian operators) is crucial. The following presentation shall display this correlation between the macroscopic and microscopic world and outline the most promising aspects of quantum mechanics.