Surface cleaning by a linear electrodynamic trap field

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It is possible to capture and retain dust, including dust from surfaces, using an electrodynamic trap. This effect can be applied for cleaning surfaces. Such a method is important for practical purposes for cleaning the inner surfaces of closed dielectric vessels or vessels with limited possibilities of penetration inside. The purpose of this work is to investigate the possibility of cleaning dielectric surfaces from the opposite side of the plate.

A quadrupole linear trap was used with four dynamic electrodes, each 4 mm in diameter and 19 cm long, which were placed at the corners of a square with a side of 2 cm. A glass plate with aluminum oxide powder was placed above the trap, with a bottom plate without particles near the trap electrodes. After applying a harmonic voltage with a frequency of 50 Hz to the trap electrodes on the opposite side of the glass plate, dusting of the surface began. The solar panel surfaces could be cleaned in this way from the side closest to the trap. Thus, the possibility of cleaning dielectric surfaces from dust has been experimentally demonstrated, not only from the plate surface closest to the trap, but also from the bottom surface of the plate. The possibility of removing dust from the surface of a small-sized solar panel from the near side to the trap has been demonstrated.