

# The Modern Physics of Compact Stars and Relativistic Gravity

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## Electromagnetic two-point functions and densities for a conducting plate in de Sitter spacetime

Two-point functions for the electromagnetic field in background of  $(D+1)$  dimensional de Sitter spacetime are evaluated assuming that the field is prepared in the Bunch-Davies vacuum state. By using these functions the vacuum expectation values (VEVs) of the field squared and the energy-momentum tensor are investigated in the geometry of a conducting plate. The VEVs are explicitly decomposed into the boundary-free and plate-induced parts. For points outside of the plate the renormalization is needed for only the first parts only. Because of the maximal symmetry of the background spacetime and of the Bunch-Davies vacuum state the boundary-free parts do not depend on spacetime coordinates, whereas the plate-induced parts are functions of the proper distance of the observation point from the plate. The plate-induced part in the VEV of the energymomentum tensor vanishes for  $D=3$  which is a direct consequence of a conformal invariance of the electromagnetic field for this spatial dimension. For  $D>3$ , in addition to the diagonal components, the vacuum energy-momentum tensor has a nonzero off-diagonal component which describes energy flux along the direction normal to the plate.

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