Seminar
Hawking Radiation and Vacuum Polarization

Speaker: Prof. Sang Pyo Kim (Kunsan U.)
Date and time: June 2, 2011, 16:00 -
Place: Kinki University, Building No. 31, 3rd floor, Seminar room

Abstract

The exact one-loop effective action in a Schwarzschild black hole in the proper-time integral from the Schwinger variational principle has the same form, up to number of states, as the Heisenberg-Euler and Schwinger QED effective action in a constant electric field. The leading term for Hawking radiation comes from the first simple pole of the vacuum polarization and the sum of residues from all simple poles exactly leads to the vacuum persistence. The vacuum persistence is the total flux of Hawking radiation for bosons and fermions and the vacuum polarization has an expression of thermal distribution and the propagator. The physical implications of vacuum polarization of black hole will be discussed and be extended to de Sitter spaces.

Literature:

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