

Abstract Submitted  
for the APR06 Meeting of  
The American Physical Society

**Back Reaction of the Hawking Radiation** CECILE DEWITT-MORETTE, University of Texas at Austin — Three fundamental papers by G.A. Vilkovisky: “Kinematics of evaporating black holes,” “Radiation equations for black holes,” and “Backreaction of the Hawking radiation” (respectively available from arXiv:hep-th/0511182/3/4) present the calculation of the evolution of black holes driven by the Hawking radiation. The solution of the backreaction problem is a generalization of the Schwarzschild metric. Bryce DeWitt had been hoping that the solution of the backreaction problem would be obtained in time for him to include it in his book “The Global Approach to Quantum Field Theory” The Hawking radiation and its backreaction are semiclassical effects. According to Vilkovisky, blackholes create a “vacuum matter charge” to protect themselves from the quantum evaporation. A spherically symmetric black hole having initially no “matter charges” radiates away about 10% of the initial mass and comes to a state in which the vacuum-induced charge equals the remaining mass. The metric in the semiclassical region of the collapse spacetime is obtained and studied. I shall present and discuss Vilkovisky’s work.

Cecile DeWitt-Morette  
University of Texas at Austin

Date submitted: 04 Jan 2006

Electronic form version 1.4