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Hawking radiation from non-stationary rotating de Sitter black hole

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A study of Hawking radiation from non-stationary rotating de Sitter black hole is carried out by using the Hamilton-Jacobi method. It is shown that in the vicinity of the event horizon, there exist seas of positive and negative energy states which are separated by a forbidden energy gap. The width of the forbidden energy gap vanishes at the event horizon so that the positive and negative energy levels overlap. The width of the forbidden energy gap and the energy of the particle at the event horizon are found to depend on the cosmological constant, positions of the particle and the event horizon, angular momenta of the particle and of the black hole, evaporation rate of the black hole and the shape of the event horizon. The tunneling probability of the emitted particles constituting the Hawking radiation is also deduced for the stationary non-rotating de Sitter black hole. The emitted spectrum is found to be thermal and the corresponding temperature of the event horizon is determined.

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