

UV Origin of Late-time Hawking Radiation

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We reexamined the connection between the Hawking radiation of a Schwarzschild black hole formed from collapse and ultraviolet(UV) physics with the local Lorentz symmetry violation or the existence of a minimal length. Significant modifications are reported after the scrambling time in both cases, which reflects the UV sensitivity of Hawking radiation. Depending on the physics at the singularity, Hawking radiation with the modified dispersion relation may be largely suppressed with a striking tunneling phenomenon behind. The Hawking wavepacket may exceed the size of the black hole under the generalized uncertainty principle that it longer employs the near horizon Unruh vacuum with a diminishing Hawking radiation amplitude. While a turned-off effect is shared in these two implementations, the Hawking temperature remains the same or only perturbatively corrected.

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