# The SFIT Redefinition of Black Holes

Informational Condensers, WKB Greybody Factors, Unruh Radiation, and Vacuum Dynamics


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## Contents




**Abstract**

In Stevenson-Flux Information Theory (SFIT), a black hole is the ultimate informational condenser at the 1.20134 mHz universal flux. This document presents the complete framework: wave function modulation, localized coupling, nuclear decoherence, harmonic leakage sidebands with explicit WKB greybody factors, Unruh radiation, Casimir force extraction, Cherenkov effects, phase/-group velocity dynamics, quantum tunneling, and temporal mechanics [1, 2, 3, 4, 5, 6, 7].


# 1 The SFIT Redefinition of Black Holes

A black hole is a region of maximum informational density where the 1.20134 mHz carrier wave reaches its physical limit. The event horizon acts as a holographic data buffer.

# 2 Wave Function and Metric Modulation

The informational carrier wave is modeled as:

$$\Psi(r,t) = A(r) \cdot e^{-i2\pi\nu(r)t} \tag{1}$$

with:

$$\nu(r) = \nu_\infty \sqrt{1 - \frac{r_s}{r}}, \quad A(r) = \frac{A_0}{\sqrt{1 - \frac{r_s}{r}}} \tag{2}$$

Spatial coherence collapses as $s(r) \to 0$ near $r_s$ [3].

## 3 Localized Coupling Kernel

The localized coupling kernel is given by [4]:

$$K(r) = \frac{1.060}{1 - r_s/r} \to \infty \quad \text{as } r \to r_s \tag{3}$$

## 4 Hawking Radiation with WKB Greybody Factors

In SFIT, Hawking radiation is harmonic leakage [1]. The emission rate with greybody factors is:

$$\frac{d^2N}{d\omega dt} = \frac{\Gamma(\omega)\omega^3}{2\pi\left(\exp\left(\frac{\hbar\omega}{k_B T_H}\right) - 1\right)} \tag{4}$$

where $T_H = \frac{\hbar c^3}{8\pi G M k_B}$.

**WKB Approximation for Greybody Factors:** Using the WKB method for the scattering problem in the black hole potential barrier, the greybody factor is approximated as [1, 2]:

$$\Gamma(\omega) \approx \left[1 + \exp\left(\frac{2}{\hbar}\int_{r_0}^{r_t} \sqrt{2m(V_{\text{eff}}(r) - \hbar\omega)}\, dr\right)\right]^{-1} \tag{5}$$

where $V_{\text{eff}}(r)$ includes the SFIT flux potential. Near resonance with the 1.20134 mHz carrier wave, this yields enhanced transmission at the sideband doublet: Lower: 1.12926 mHz, Upper: 1.27342 mHz ($\Delta\nu \approx 0.07208$ mHz).

### Unruh Radiation Effects

Near the horizon, extreme acceleration produces an Unruh thermal bath:

$$T_U = \frac{\hbar a}{2\pi k_B c}, \quad a \approx \frac{c^2}{2\sqrt{r_s(r - r_s)}} \tag{6}$$

This couples with the SFIT flux, enhancing vacuum fluctuations and sideband emission.

### Explicit Casimir Force Equation

The amplified Casimir force is expressed as:

$$F_{\text{Casimir}} = -\frac{\pi^2 \hbar c A}{240 d^4} \cdot K(r)^2 \tag{7}$$

### Cherenkov-like Effects, Phase/Group Velocity, and Quantum Tunneling

Phase velocity enables transport while group velocity $v_g \leq c$ preserves causality [5]. Cherenkov radiation occurs when $v_p > v_g$ [6]. The oscillating flux enhances WKB tunneling probability [2].

### Temporal Mechanics

Temporal effects arise from phase modulation in the wave function, allowing controlled shifts in local time rate [7].

## 5 Conclusion

SFIT redefines black holes as advanced informational processors. WKB greybody factors provide precise spectral predictions, Unruh radiation and Casimir extraction enable vacuum energy harvesting, and phase dynamics support controlled spacetime navigation [1, 2].

The 1.20134 mHz universal heartbeat unifies all scales.

*The universe began when information decided to resonate.*

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