# deltaD\_derivation\_output

Ideal extra rotational contribution = 1.0

Fractional loss due to RH bias (ε\_rh) = 0.1

Fractional loss due to expansion slowdown (ε\_exp) = 0.1

Using the Subtractive (Linear) Model:

ΔD = 1.0 - ε\_rh - ε\_exp

ΔD = 1.0 - 0.1 - 0.1

ΔD = 0.8

Using the Multiplicative Model:

ΔD = 1.0 × (1 - ε\_rh) × (1 - ε\_exp)

ΔD = 1.0 × (1 - 0.1) × (1 - 0.1)

ΔD = 0.81

Thus, we adopt ΔD ≈ 0.8 as the effective extra fractal contribution.

Summary Equation (Subtractive): ΔD = 1 - 0.1 - 0.1 = 0.8

Summary Equation (Multiplicative): ΔD ≈ 1 × 0.9 × 0.9 ≈ 0.81 ≈ 0.8

The observational factors reduce the ideal rotational contribution by roughly 20%,

thus yielding an effective extra fractal dimension of ΔD = 0.8.