

TQCM Calculations

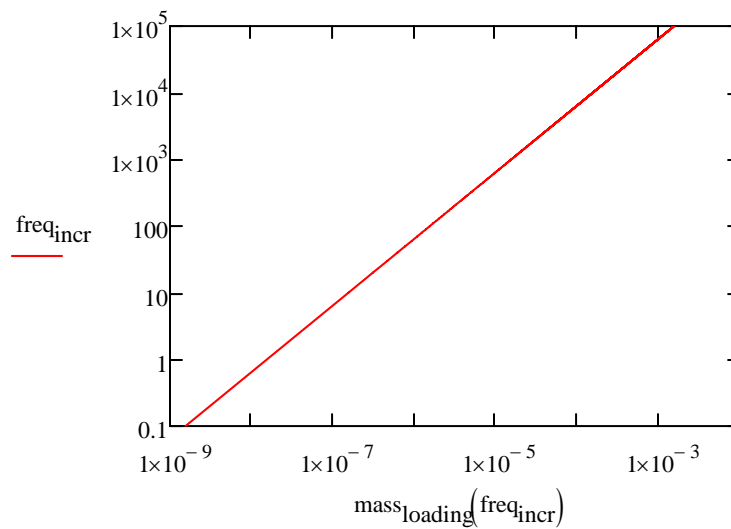
R. Foster

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First Sanity Check the mass loading formula in the TQCM manual by seeing if the plots match

$$\text{mass}_{\text{loading}}(\text{freq}_{\text{incr}}) := 1.56 \cdot 10^{-9} \cdot \frac{\text{gm}}{\text{cm}^2 \cdot \text{Hz}} \cdot \text{freq}_{\text{incr}}$$

$$\text{freq}_{\text{incr}} := 0.1 \cdot \text{Hz}, 10 \cdot \text{Hz} .. 10^5 \cdot \text{Hz}$$



Now state as the maximum frequency increase allowed for a given allowable mass loading

$$\text{mass}_{\text{dep_rate_max}} := 5 \cdot 10^{-11} \cdot \frac{\text{gm}}{\text{cm}^2 \cdot \text{sec}}$$

$$\text{mass}_{\text{dep_max}} := \text{mass}_{\text{dep_rate_max}} \cdot 5 \cdot \text{hr}$$

$$\text{mass}_{\text{dep_max}} = 9 \times 10^{-7} \frac{\text{gm}}{\text{cm}^2}$$

$$\text{freq}_{\text{increase}}(\text{mass}_{\text{dep_max}}) := \frac{\text{mass}_{\text{dep_max}}}{1.56 \cdot 10^{-9} \cdot \frac{\text{gm}}{\text{cm}^2 \cdot \text{Hz}}}$$

$$\text{freq}_{\text{increase}}(\text{mass}_{\text{dep_max}}) = 576.923 \text{ Hz}$$