Cartridge model for Shure V15/V

$l_c := 350\text{mH}$ $\qquad$ $r_c := 815\text{ohm}$ $\qquad$ L and R for the cartridge

$r_l := 47000\text{ohm}$ $\qquad$ The recommended load resistance

$$X_l(f, c_l) := \frac{\dfrac{1}{j \cdot 2 \cdot \pi \cdot f \cdot c_l} \cdot r_l}{\dfrac{1}{j \cdot 2 \cdot \pi \cdot f \cdot c_l} + r_l}$$

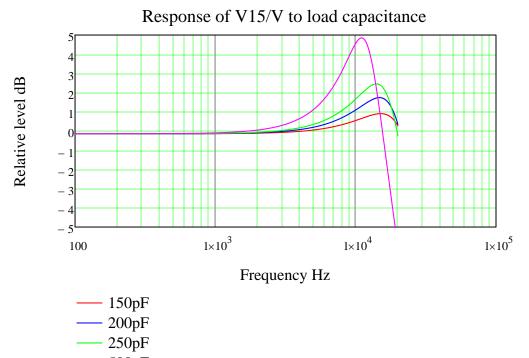The impedance of the load as a function of frequency and load capacitance

$$X_c(f) := j \cdot 2 \cdot \pi \cdot f \cdot l_c + r_c$$

The impedance of the cartridge as a function of frequency

$$op(f, c_l) := \frac{X_l(f, c_l)}{X_l(f, c_l) + X_c(f)}$$

Relative output level as a function of frequency and load capacitance. This is plotted below for various values of load capacitance.

$f := 100, 120 .. 20000$

Response of V15/V to load capacitance

Relative level dB

Frequency Hz

- ——— 150pF
- ——— 200pF
- ——— 250pF
- ——— 500pF