G32RESGG

Calculation of Resonator using g1, g2, and d

$$\begin{pmatrix} 1 & 0 \\ \frac{g1-1}{d} & 1 \end{pmatrix} \cdot \begin{pmatrix} 1 & d \\ 0 & 1 \end{pmatrix} \cdot \begin{bmatrix} 1 & 0 \\ \frac{2\cdot(g2-1)}{d} & 1 \end{bmatrix} \cdot \begin{pmatrix} 1 & d \\ 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 1 & 0 \\ \frac{g1-1}{d} & 1 \end{pmatrix}$$

$$\begin{bmatrix} -1 + 2\cdot g1\cdot g2 & 2\cdot d\cdot g2 \\ 2\cdot g1\cdot\frac{(-1 + g1\cdot g2)}{d} & -1 + 2\cdot g1\cdot g2 \end{bmatrix}$$

$$\text{eigenvals}\left[\begin{bmatrix} -1 + 2\cdot g1\cdot g2 & 2\cdot d\cdot g2 \\ 2\cdot g1\cdot\frac{(-1 + g1\cdot g2)}{d} & -1 + 2\cdot g1\cdot g2 \end{bmatrix}\right]$$

$$\left[(1,1,1) = -1 + 2\cdot g1\cdot g2 + 2\cdot\sqrt{-g1\cdot g2 + g1^2\cdot g2^2} \quad (1,1,2) = -1 + 2\cdot g1\cdot g2 - 2\cdot\sqrt{-g1\cdot g2 + g1^2\cdot g2^2}\right]$$

$r1 := 1 \qquad r2 := 1 \qquad d := 2$

$$g1 := 1 - \frac{d}{r1} \qquad g2 := 1 - \frac{d}{r2}$$

$$\lambda1 := -1 + 2\cdot g1\cdot g2 + 2\cdot\sqrt{-g1\cdot g2 + g1^2\cdot g2^2}$$

$$\lambda2 := -1 + 2\cdot g1\cdot g2 - 2\cdot\sqrt{-g1\cdot g2 + g1^2\cdot g2^2}$$

$\lambda1 = 1 \qquad \lambda2 = 1$

We set the product g1g2 =x and plot it over the range from -1 to 2

$$x := -1, -.9 .. 2$$

$$y(x) := \left|(2\cdot x - 1) + \sqrt{(2\cdot x - 1)^2 - 1}\right| - 1$$

$$yy(x) := \left|(2\cdot x - 1) - \sqrt{(2\cdot x - 1)^2 - 1}\right| - 1$$