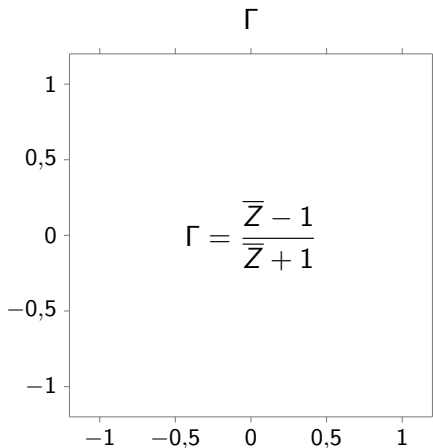# Construction of the Smith chart
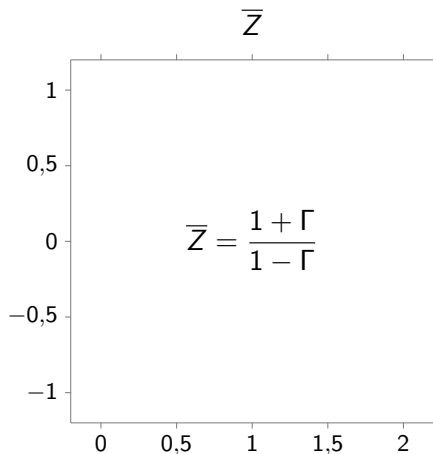
High frequency technologies
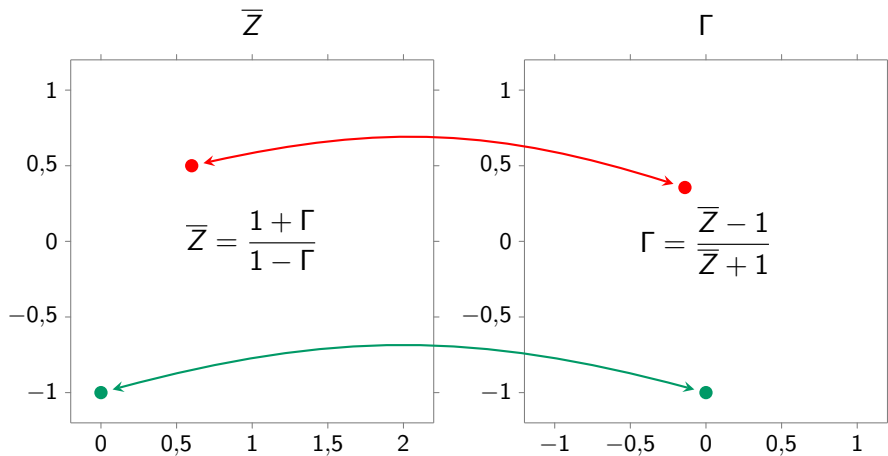
Normalized impedance vs. reflection coefficient
Complex planes

$$\overline{Z}$$

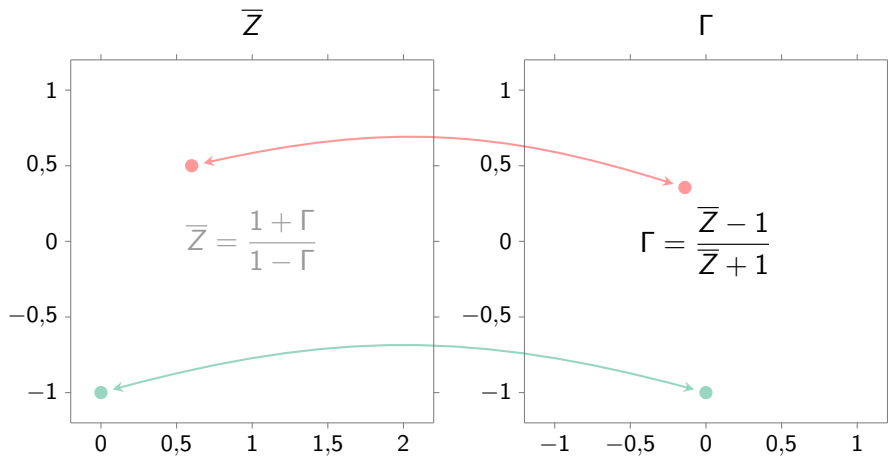$$\overline{Z} = \frac{1 + \Gamma}{1 - \Gamma}$$

$$\Gamma$$

$$\Gamma = \frac{\overline{Z} - 1}{\overline{Z} + 1}$$

Normalized impedance vs. reflection coefficient
Complex planes

$$\overline{Z} = \frac{1 + \Gamma}{1 - \Gamma}$$

$$\Gamma = \frac{\overline{Z} - 1}{\overline{Z} + 1}$$

Normalized impedance vs. reflection coefficient
Complex planes

$$\overline{Z} = \frac{1 + \Gamma}{1 - \Gamma}$$

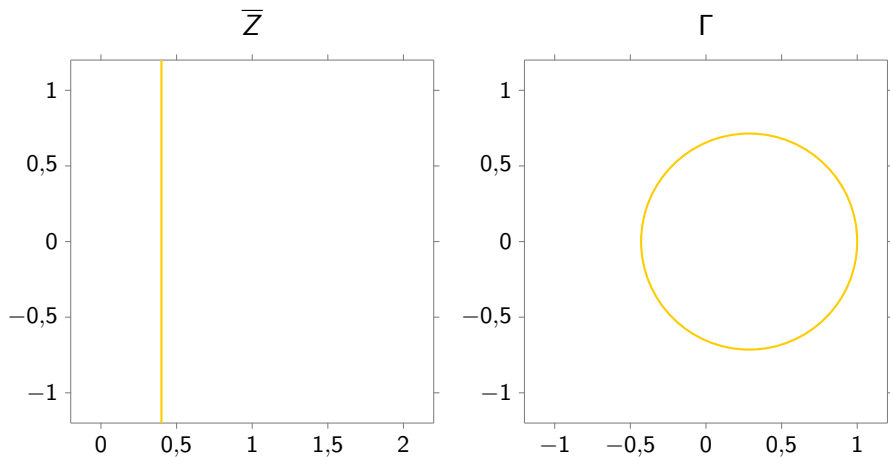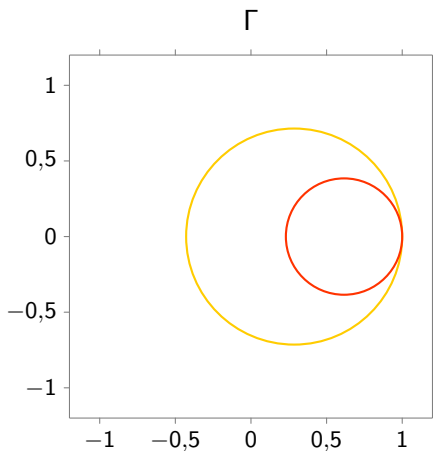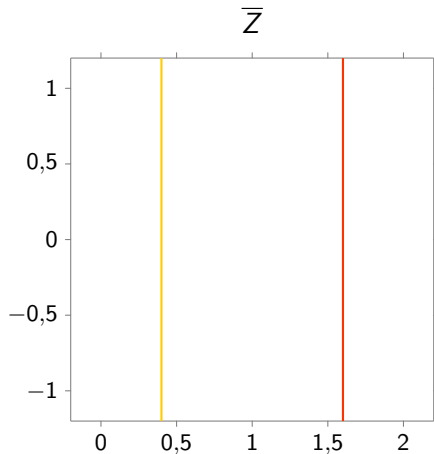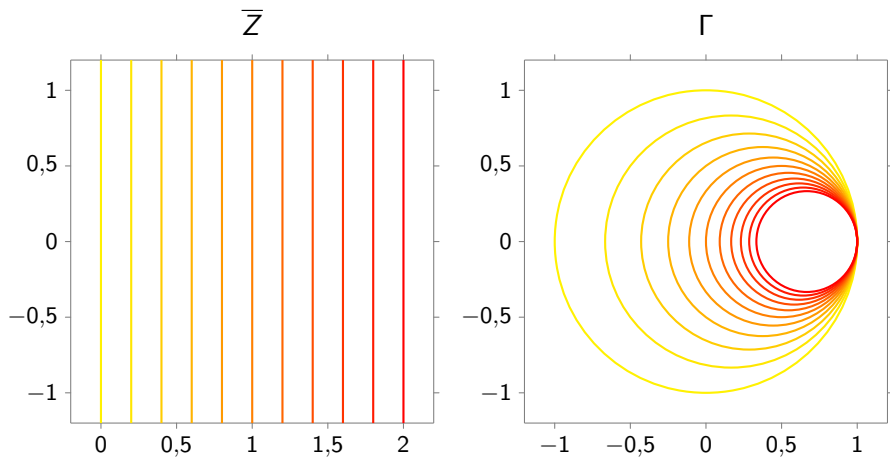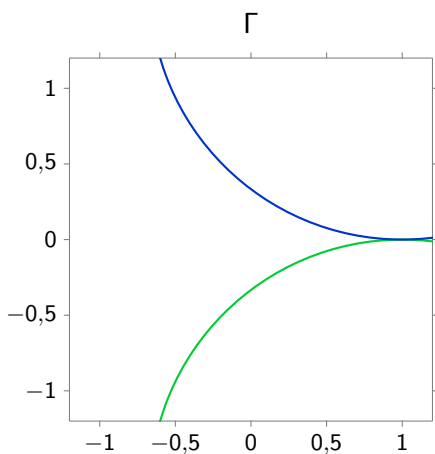$$\Gamma = \frac{\overline{Z} - 1}{\overline{Z} + 1}$$

Normalized impedance vs. reflection coefficient
Constant resistance

Normalized impedance vs. reflection coefficient
Constant resistance

Normalized impedance vs. reflection coefficient
Constant resistance
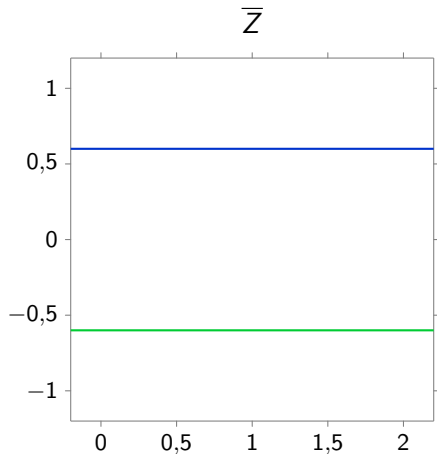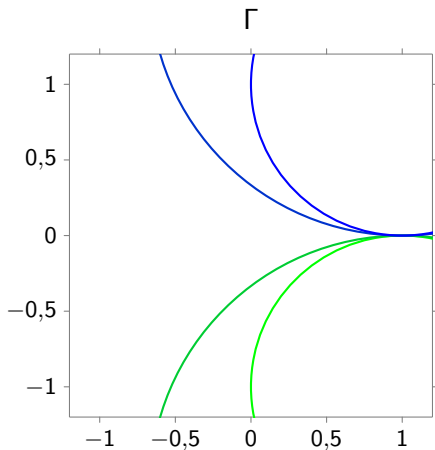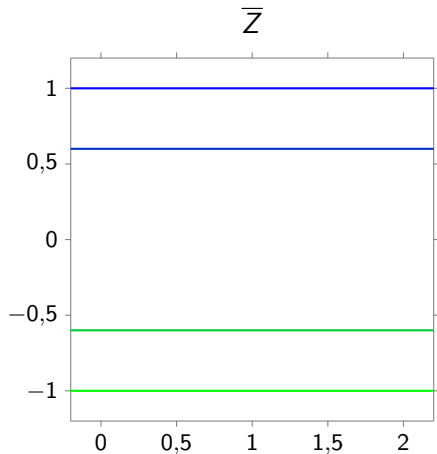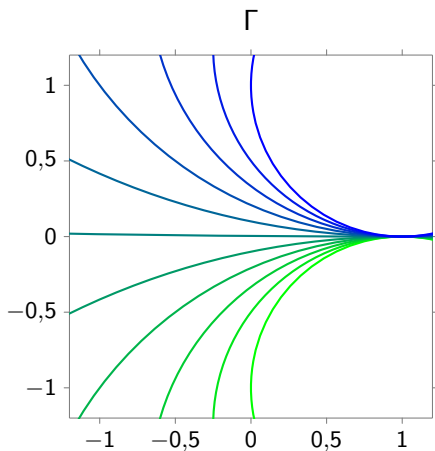
$\overline{Z}$

Γ

Normalized impedance vs. reflection coefficient

Constant reactance

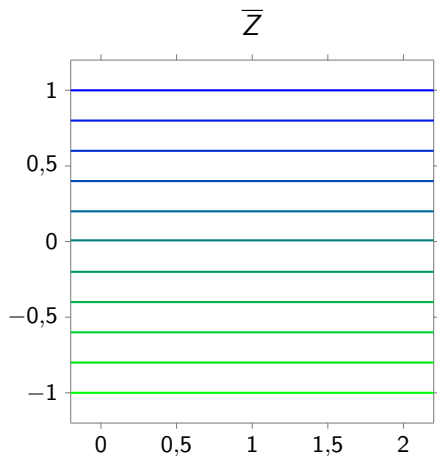# Normalized impedance vs. reflection coefficient
Constant reactance

$\overline{Z}$
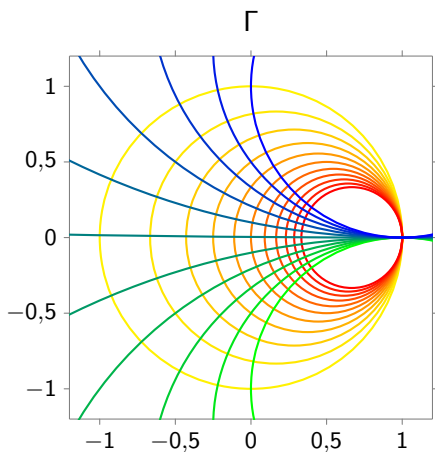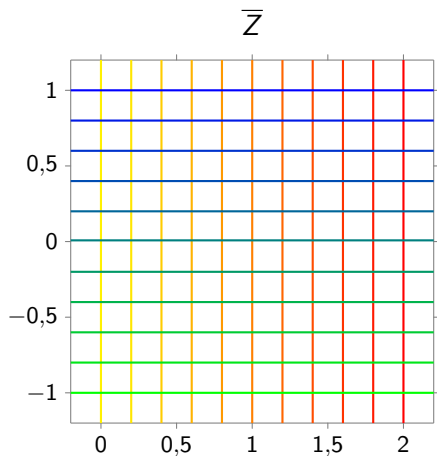
Γ

Normalized impedance vs. reflection coefficient
Constant reactance

$$\overline{Z} \qquad \Gamma$$

Normalized impedance vs. reflection coefficient

Both sets of circles

$\overline{Z}$

Γ

Normalized impedance vs. reflection coefficient

Both sets of circles, completed and trimmed (Re $\overline{Z} \geq 0 \Leftrightarrow |\Gamma| \leq 1$)

$\overline{Z}$

Γ