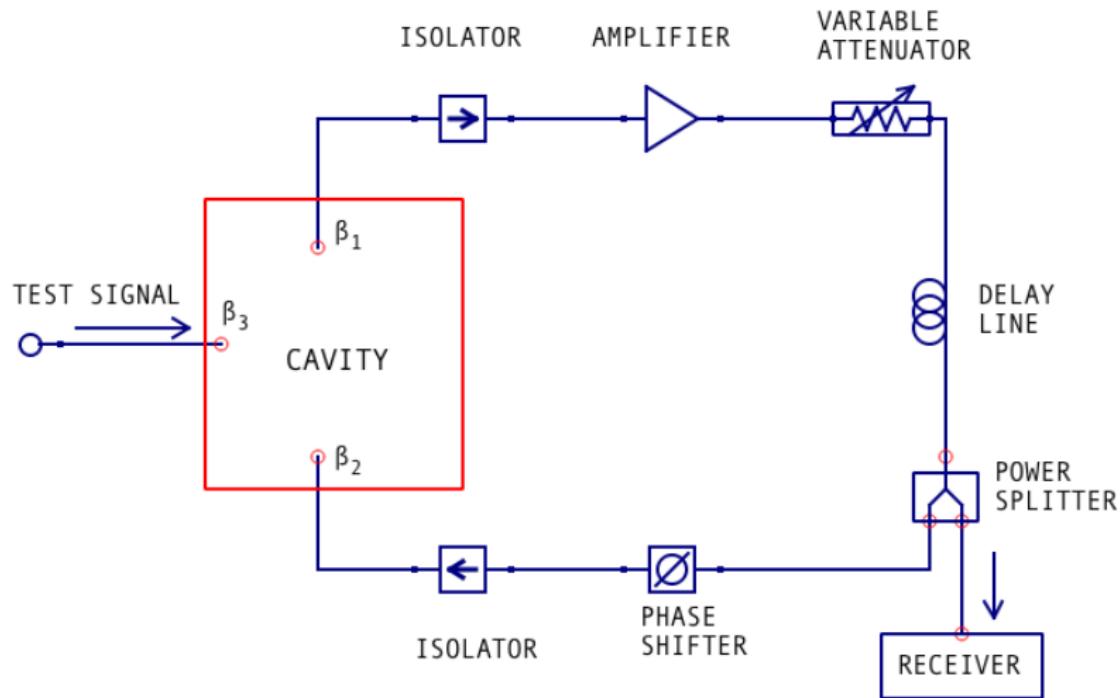


Active Feedback Resonator

Ouroboros

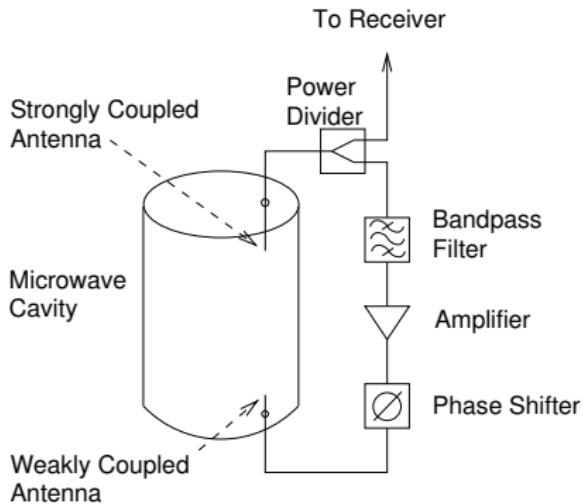


People



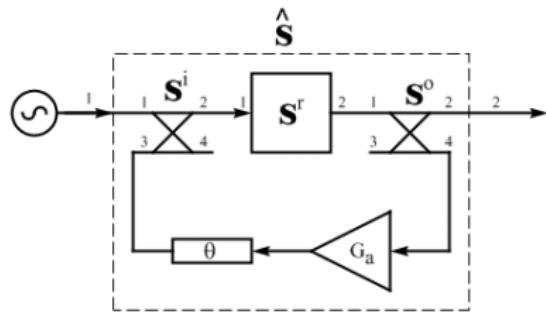
Active Feedback Resonator

Ouroboros



- ▶ t : time around loop
- ▶ τ : coherence time of cavity
- ▶ Intuition: signal feeds back coherently; when $t > \tau$, noise adds incoherently

Equivalent Circuit



G_l the loop gain

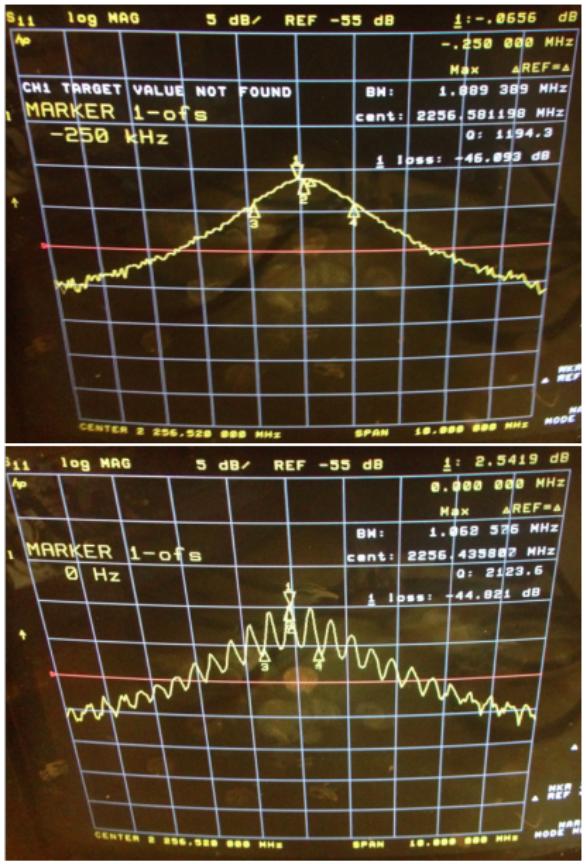
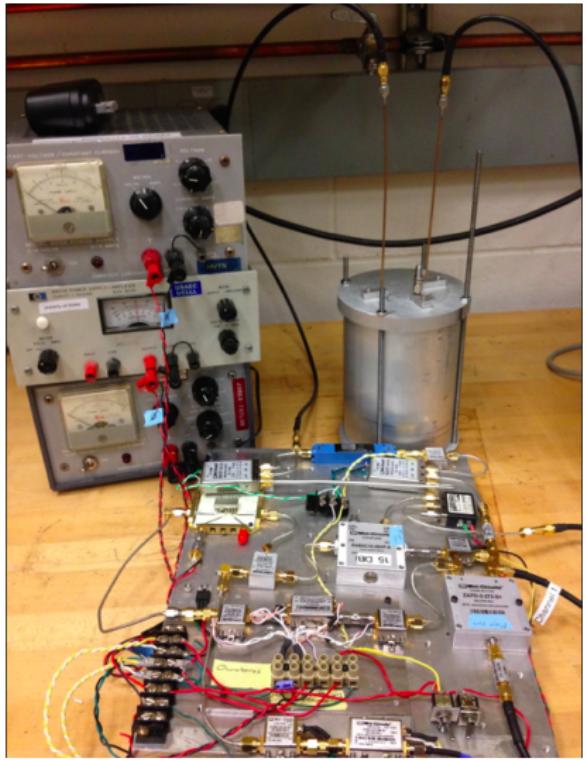
Q_0 the active quality factor

T_a the amplifier noise temperature

$$Q_0 = Q_L(1 - \sqrt{G_l})^{-1}$$
$$|\hat{S}_{21}|^2 \propto (1 - \sqrt{G_l})^{-2}$$

$$T_{noise} = \frac{T_{cav} + G_l T_a}{1 + G_l - 2\sqrt{G_l} e^{-t/\tau - i\theta}}$$

Prototype



Results

