



Parametric Amplification

$$x'' + 2\Gamma x' + \omega_0^2[1 + \alpha \cos 2\omega_0 t]x = F \cos \omega_s t$$

Pump $\omega_p = 2\omega_0$ Response $\omega_s, \omega_p - \omega_s$

$$x(t) = A \cos(\omega_i t + \varphi_1) + B \cos((2\omega_0 - \omega_s)t + \varphi_2)$$

[Energy for amplification is drawn from the pump.]







