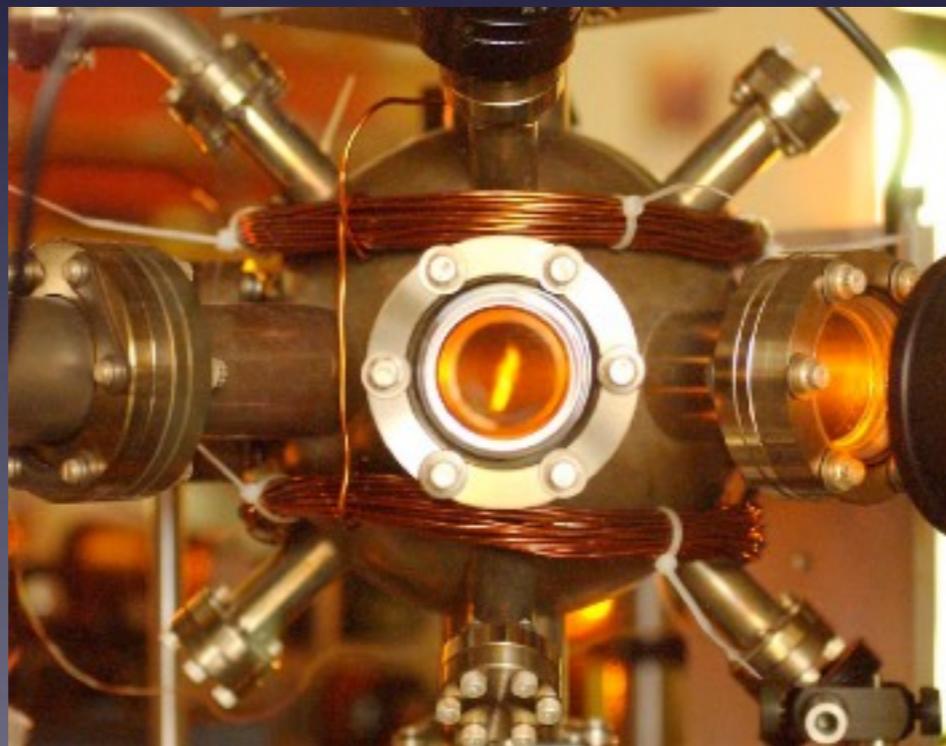


... Real BECs are Trapped

$$i\hbar\dot{\psi}_i = \left(-\delta_{ij} \frac{\hbar^2}{2m_i} \nabla^2 + V(\mathbf{x}) + g_{ij} |\psi_j|^2 \right) \psi_i - \nu_{ij} \psi_j$$

$V(x)=0$ homogeneous: $\bar{\psi}$ \rightarrow $V(x) \neq 0$ inhomogeneous $\bar{\psi}(x)$



Does parametric resonance still work?

Dimensional Reduction

Idea : Integrate out trapped directions

$$i\hbar\dot{\psi}_i = \left(-\delta_{ij} \frac{\hbar^2}{2m_i} \nabla^2 + V(\mathbf{x}) + g_{ij} |\psi_j|^2 \right) \psi_i - \nu_{ij} \psi_j$$

$$\frac{g^{D-1}}{g^D} = \frac{1}{L_\perp} = \frac{\int dx_\perp n^2}{\int dx_\perp n} = \frac{\int dx_\perp |\psi_\perp|^4}{\int dx_\perp |\psi_\perp|^2}$$