



## Simulations with tuner

- Cavity length (total): 1.375 m
- Tuner: copper coaxial structure filled with 30 ferrite cores (32 cm OD x 12 cm ID x 1 cm thick, 0.5 cm separation).  
 $\epsilon' = 13.5$ , loss tangent = 0.0002;  $\mu' = 1.2 \rightarrow 2.5$ , loss tangent = 0.0002
- Ceramic window:  $\epsilon' = 12$ , loss tangent = 0.0001;  $\mu' = 1$ , loss tangent = 0.0001

- **Lossless simulations:**

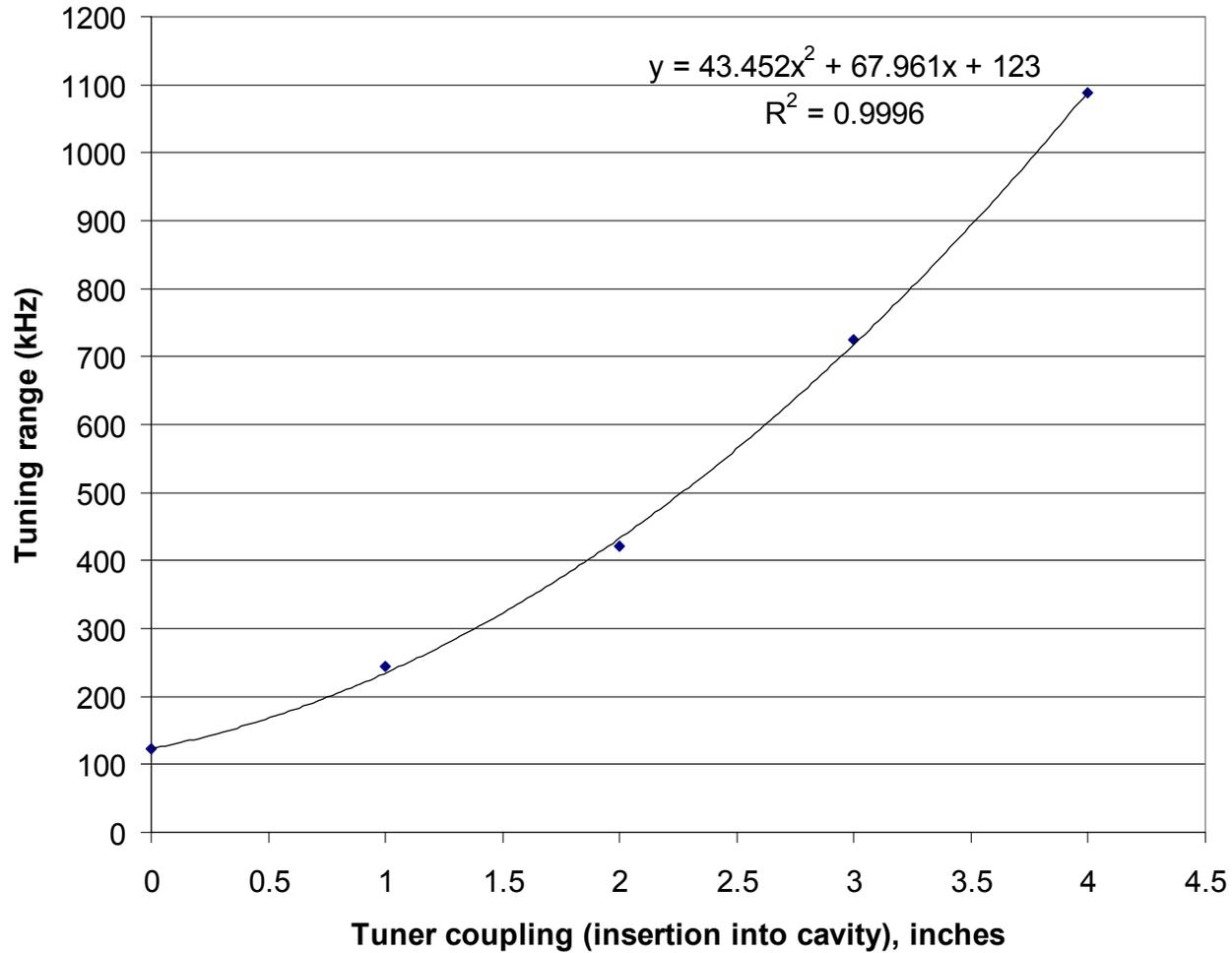
<u>Tuner coupling (in)</u>	<u><math>\mu'</math></u>	<u>Frequency (MHz)</u>	<u>Tuning range (kHz)</u>
0	1.2	53.109	123
	2.5	52.986	
1	1.2	53.129	244
	2.5	52.885	
2	1.2	53.157	421
	2.5	52.736	
3	1.2	53.192	724
	2.5	52.468	
4	1.2	53.215	1089
	2.5	52.126	

- **Lossy simulations:**

2	1.2	53.160	424
	2.5	52.736	

Imaginary part of complex frequency is of the order 200 Hz  $\rightarrow$  effect of ferrite loss on frequency is negligible.

## Tuning range vs. tuner coupling



Zero inch tuner coupling means the tuner center conductor is at the outer cavity surface radius; 4 inches tuner coupling means the tuner center conductor is touching the inner cavity conductor → maximum tuner coupling to cavity.