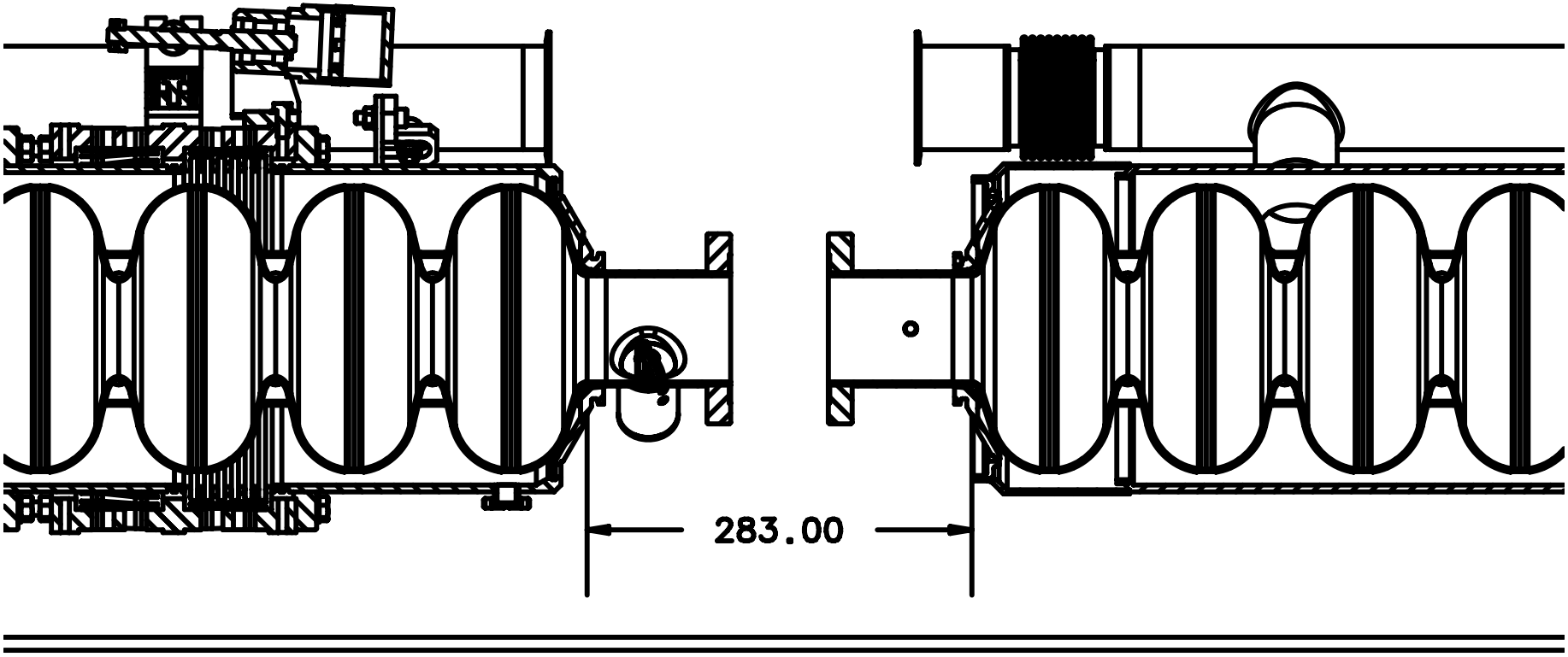
ILC International Linear Collider

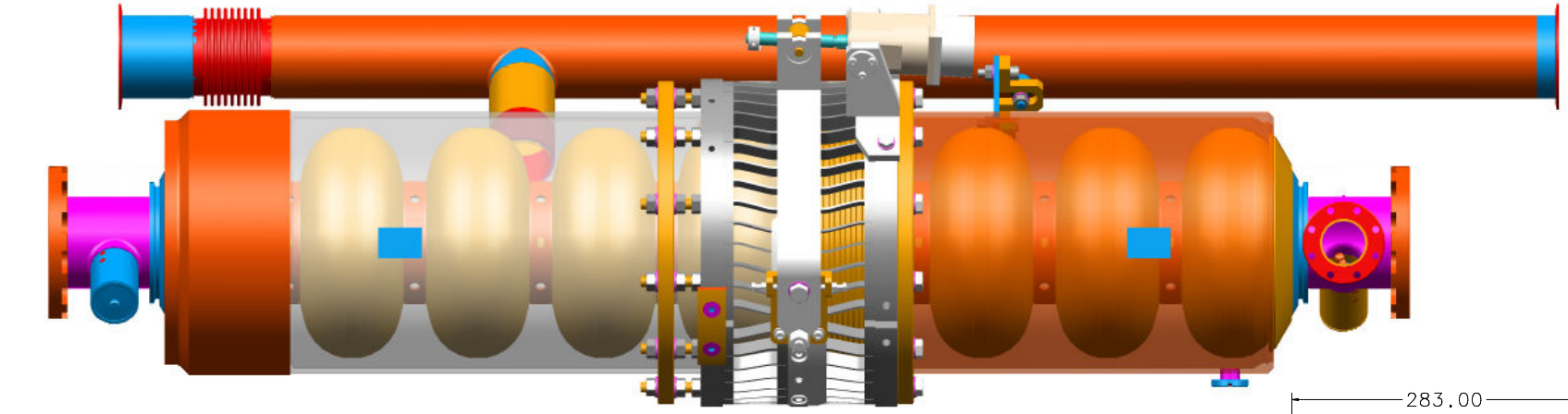
Type IV Cryomodule Inter-cavity Connections

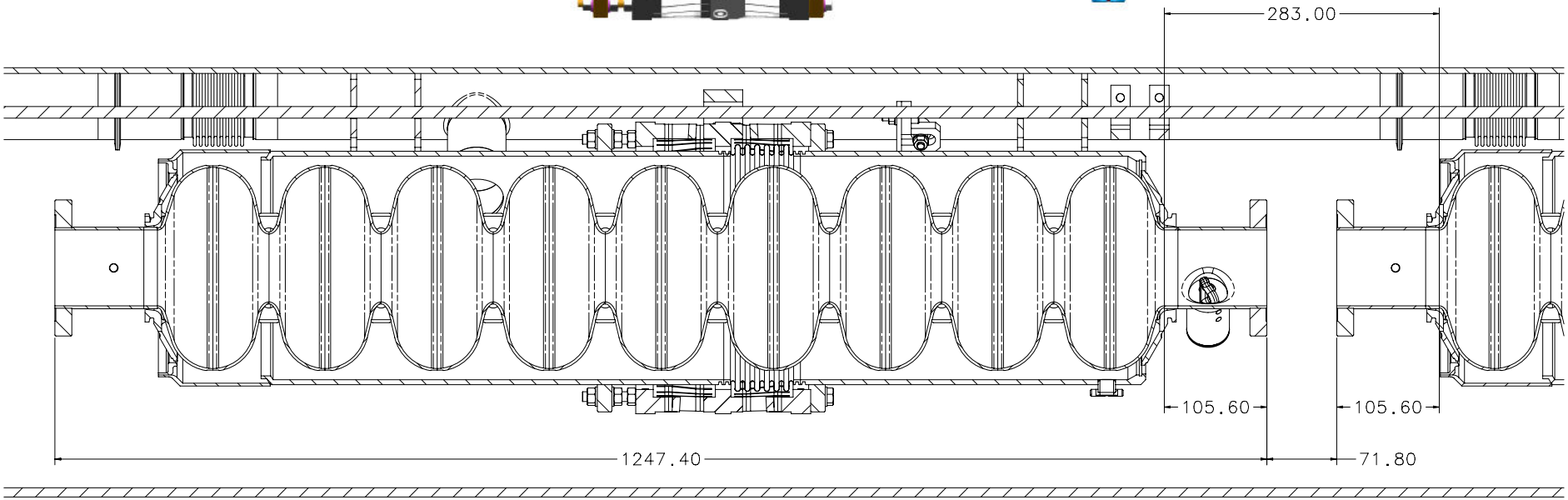
H. Carter
Fermilab
Technical Division

T4CM Cavity Spacing

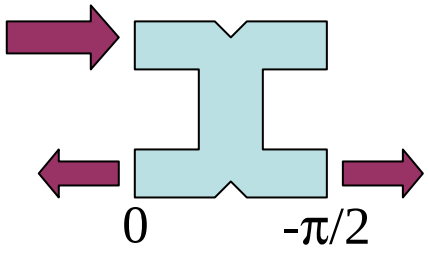


T4CM Cavity Dimensions



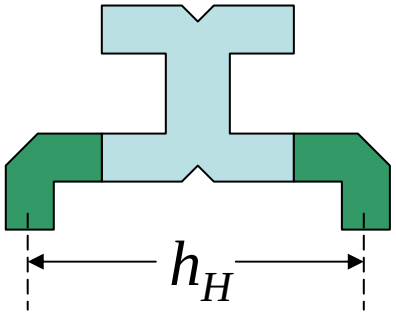


Phase Length Considerations



For cavity phasing: $-\frac{\pi}{2}-\beta(P-h_H)=-k_0P+2n\pi$

For reflection cancellation: $\beta(P-h_H)=m\pi$



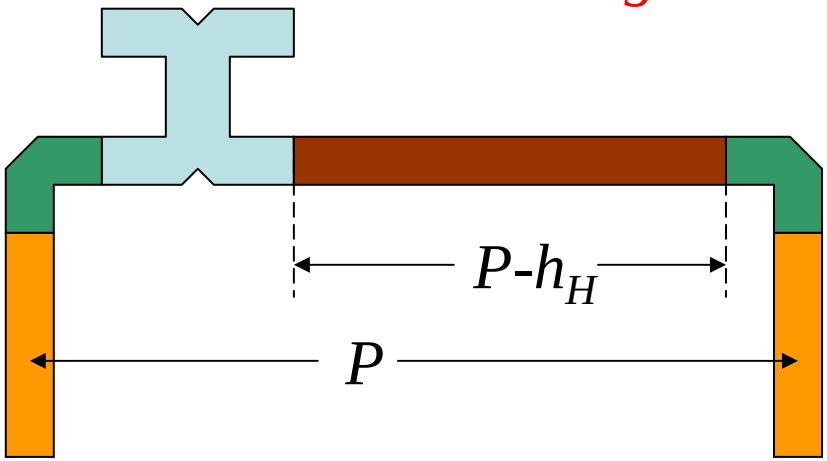
Note impact on cavity design.

$$P=\frac{(2n+m+1/2)\pi}{k_0}$$

$$=(2n+m+1/2)\times 0.115305\text{m}$$

$$h_H=P-\frac{k_0P-(2n+1/2)\pi}{\beta}$$

$$=P-\frac{m\pi}{\beta}=P-m\times 0.161104\text{m}$$



n=3, m=5: → **P=1.3260m** = 52.205”,

h_H=0.52049m = 20.492”

Since 3-stub tuners have limited range, phase lengths between pairs of cavities must also be considered, but this should be doable with directional coupler and waveguide design without impacting the cavities.

Questions

- Are we agreed upon the inter-cavity connection design for T4CM at this time?
- Review Chris Adolphsen's proposal to eliminate circulators.
- Other ideas?