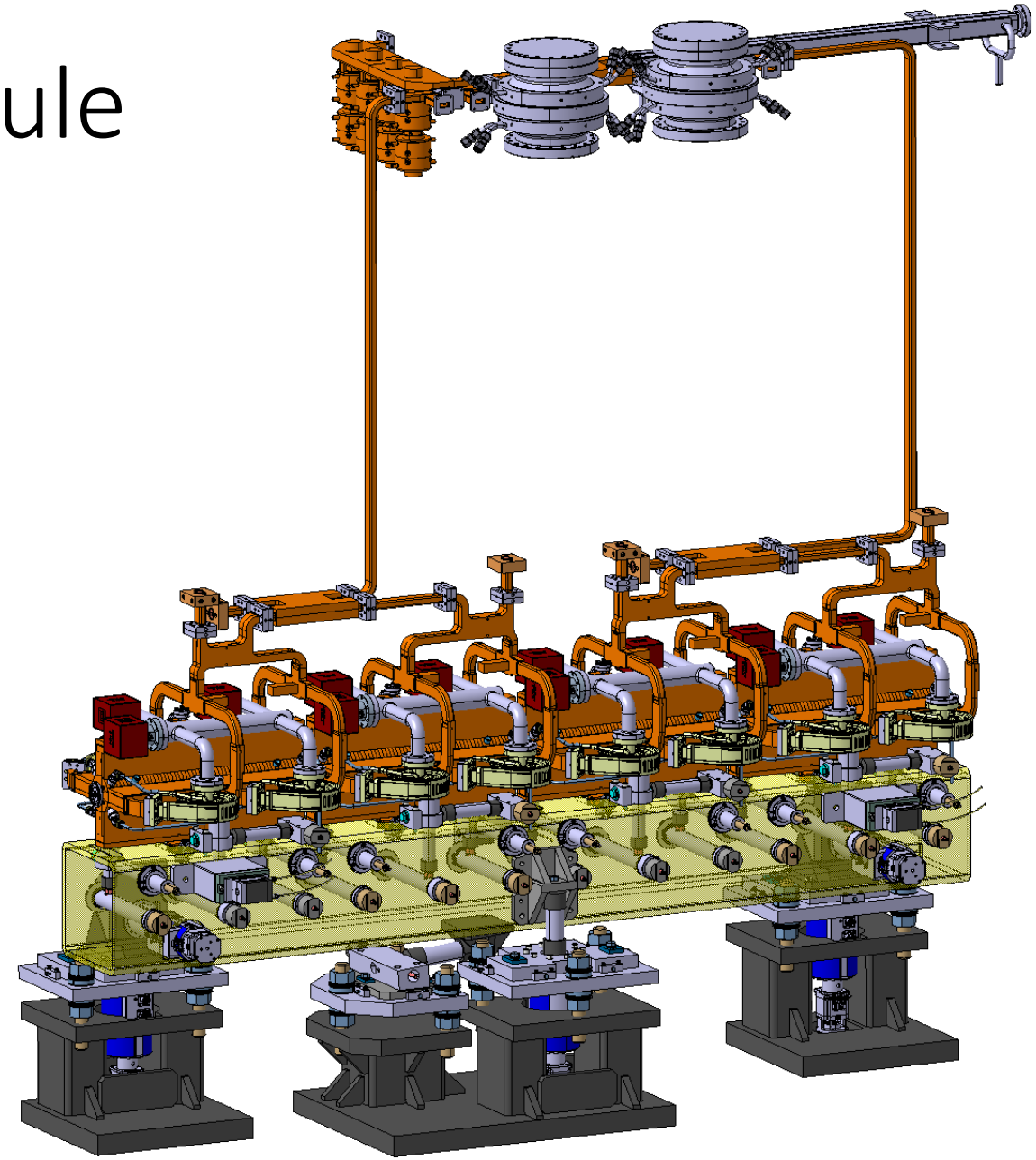
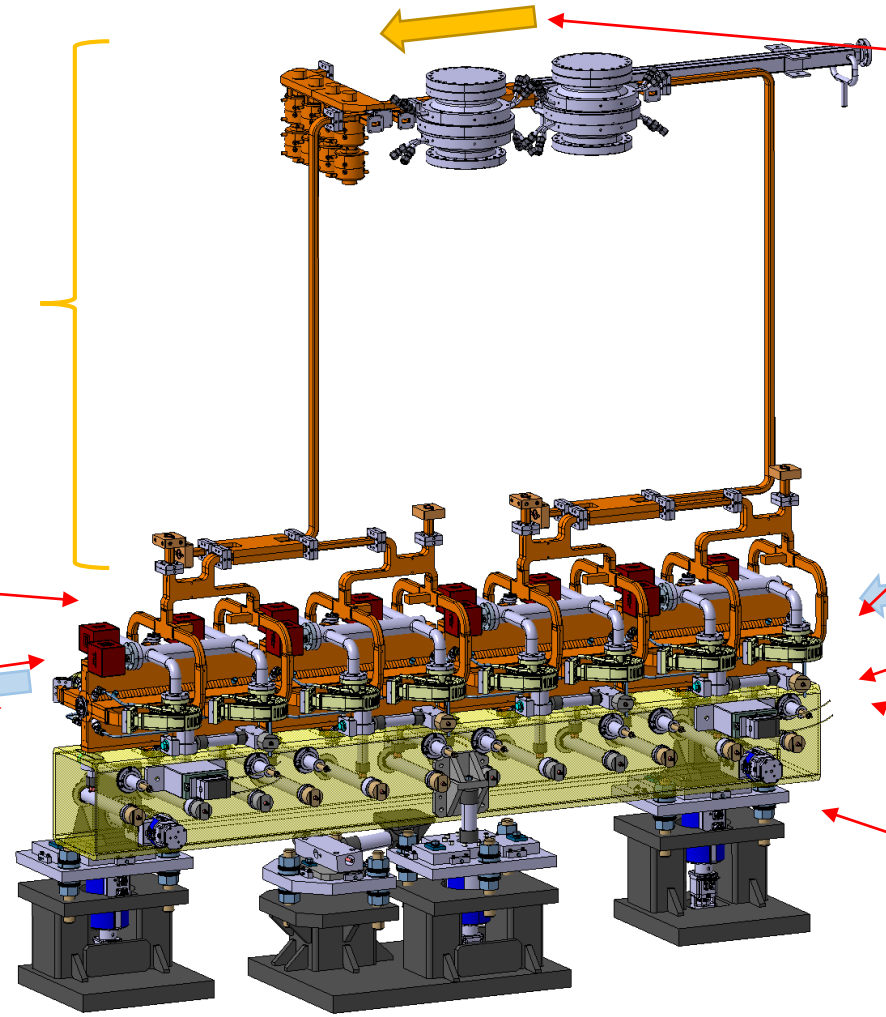
Update 21-04-21

Matthew Capstick

Flash Module



Flash Module Images



Input waveguide from Klystron (not shown)

RF power distribution network

3D-printed spiral loads

Vacuum Pumps

Common support girder & structure prealignment systems

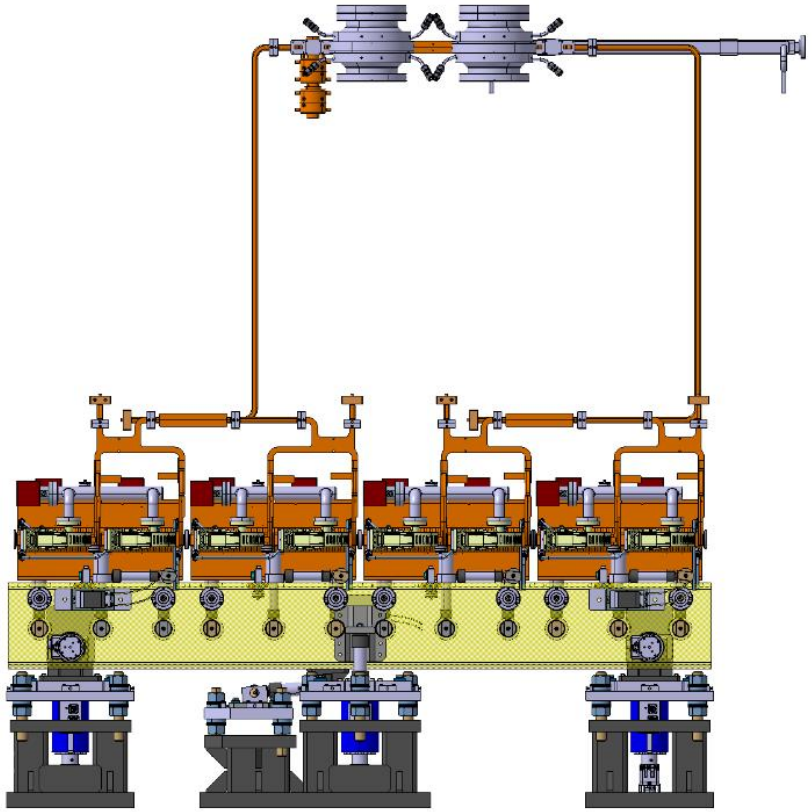
Super accelerating structures (design likely to change)

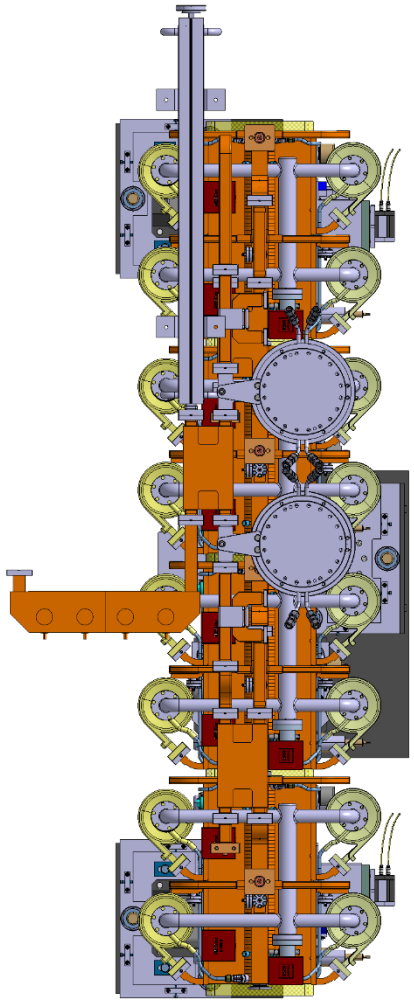
Wire positioning sensors

Beam axis

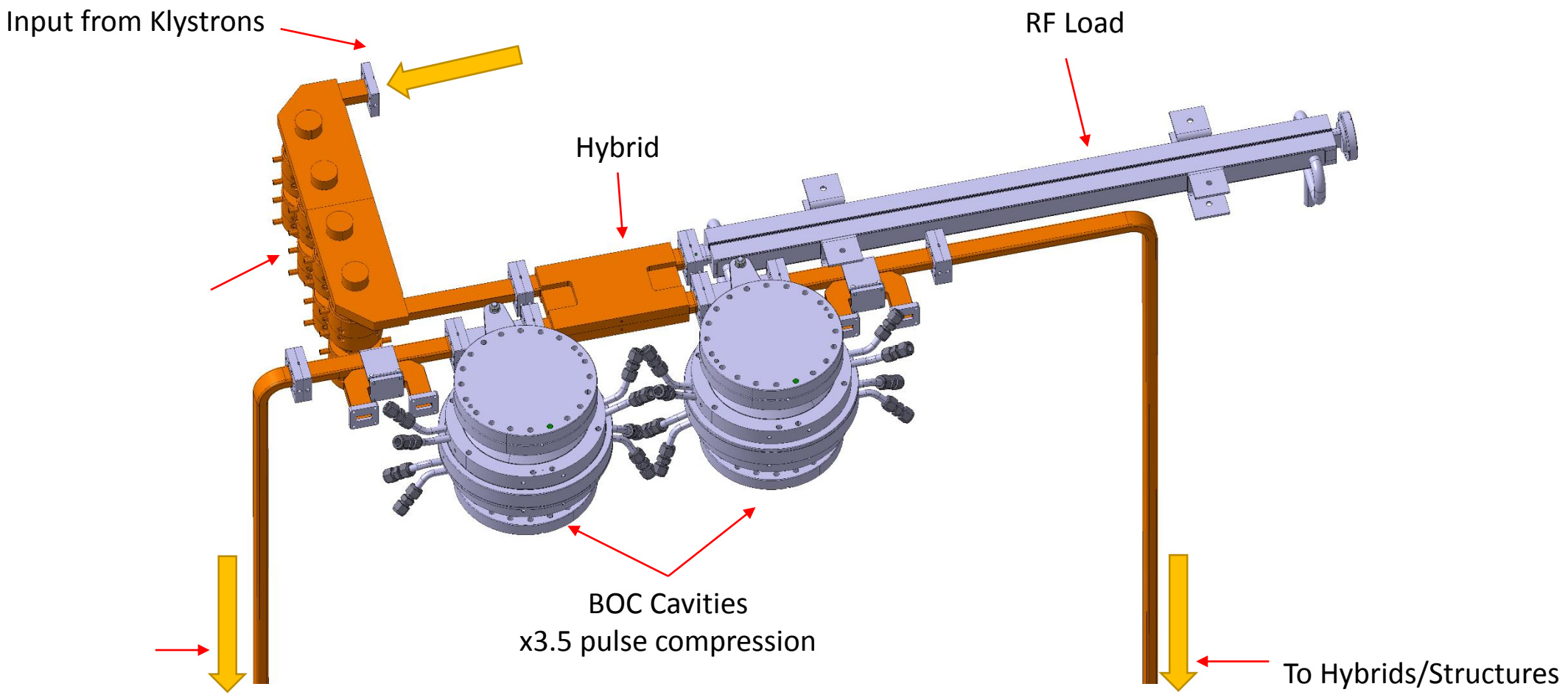
Actively positioned supports

Flash Module Images

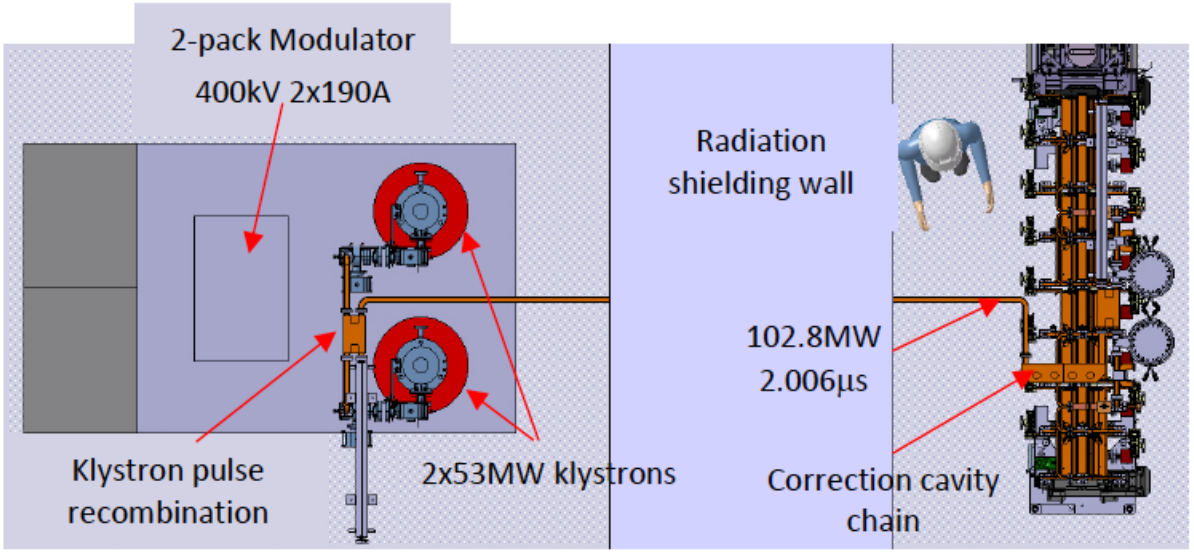




RF Power Network



RF Power Network



Module Stability Requirements

21-04-21

Stability Luminosity Impact

- Taken from: *Luminosity performance of the Compact Linear Collider at 380 GeV with static and dynamic imperfections* - *C. Gohil ,1,2,† P. N. Burrows ,1 N. Blaskovic Kraljevic ,2,A. Latina,2 J. Ögren ,2 and D. Schulte2*

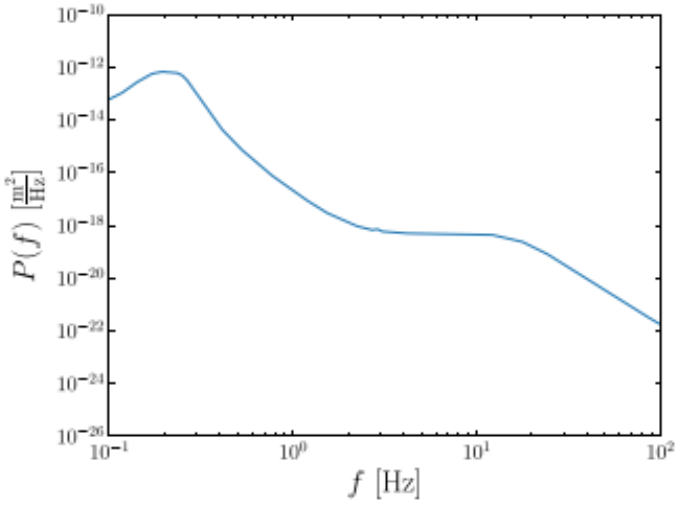


FIG. 10. PSD $P(f)$ vs frequency f of ground motion model D.

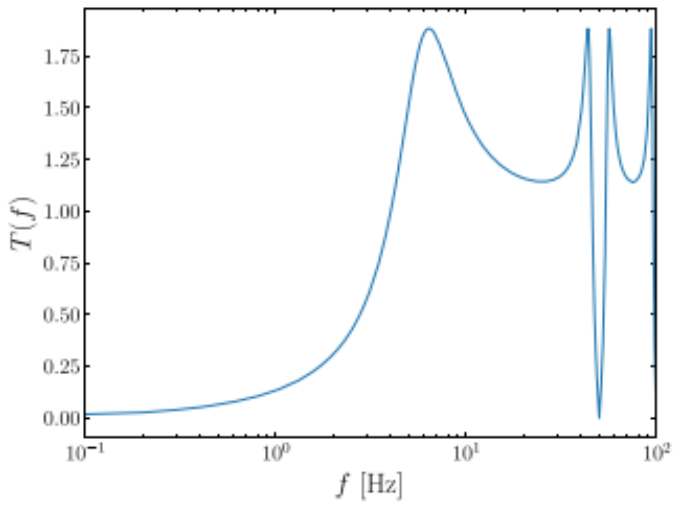


FIG. 12. Transfer function $T(f)$ vs frequency f for the beam-based feedback system used in CLIC.

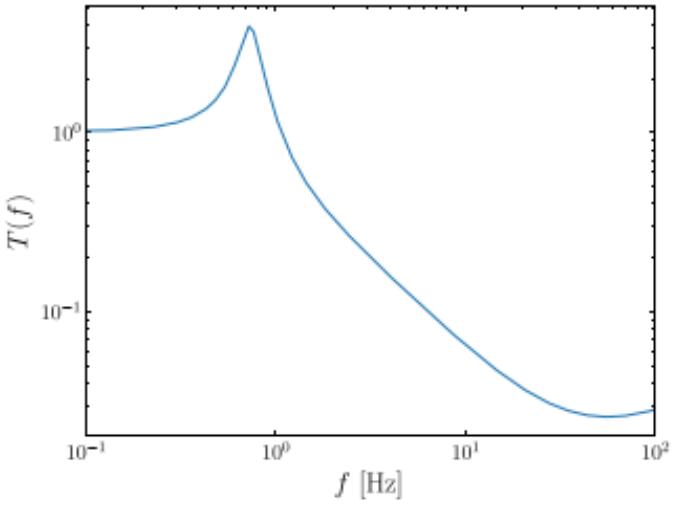
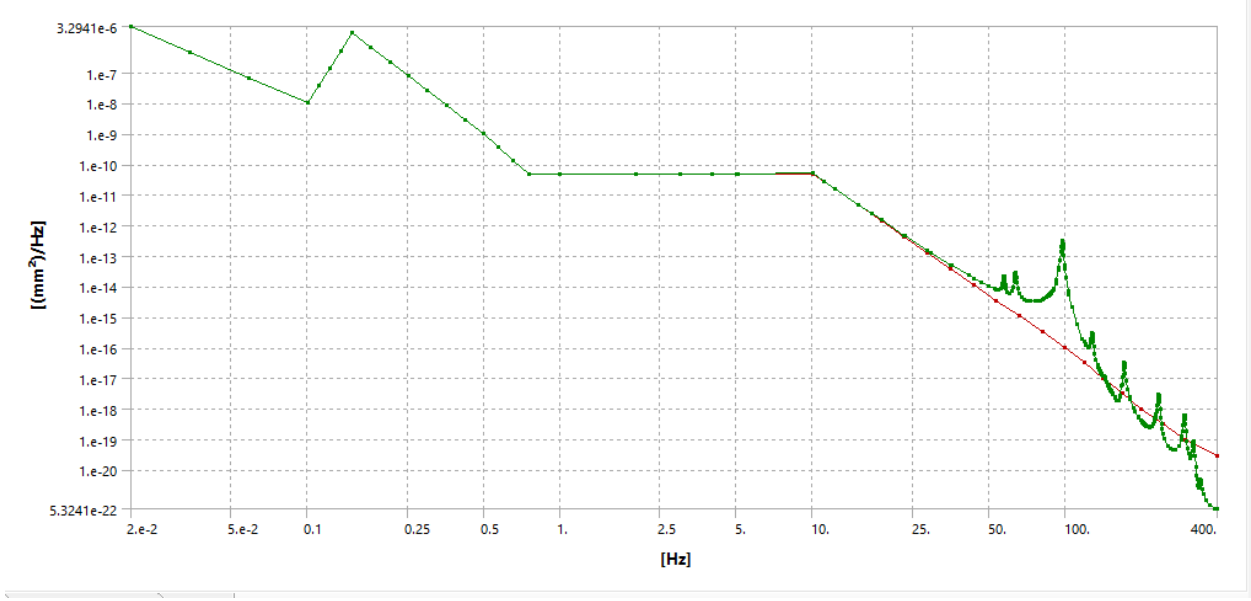


FIG. 13. Transfer function $T(f)$ vs frequency f for the quadrupole stabilization system [39].

Stability Luminosity Impact

- It is possible to determine ‘effective ground noise at the beam axis’ using the analysis we’ve done



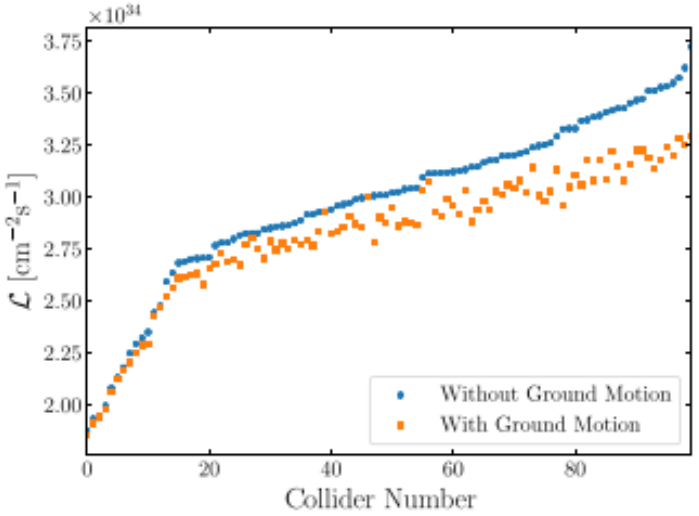
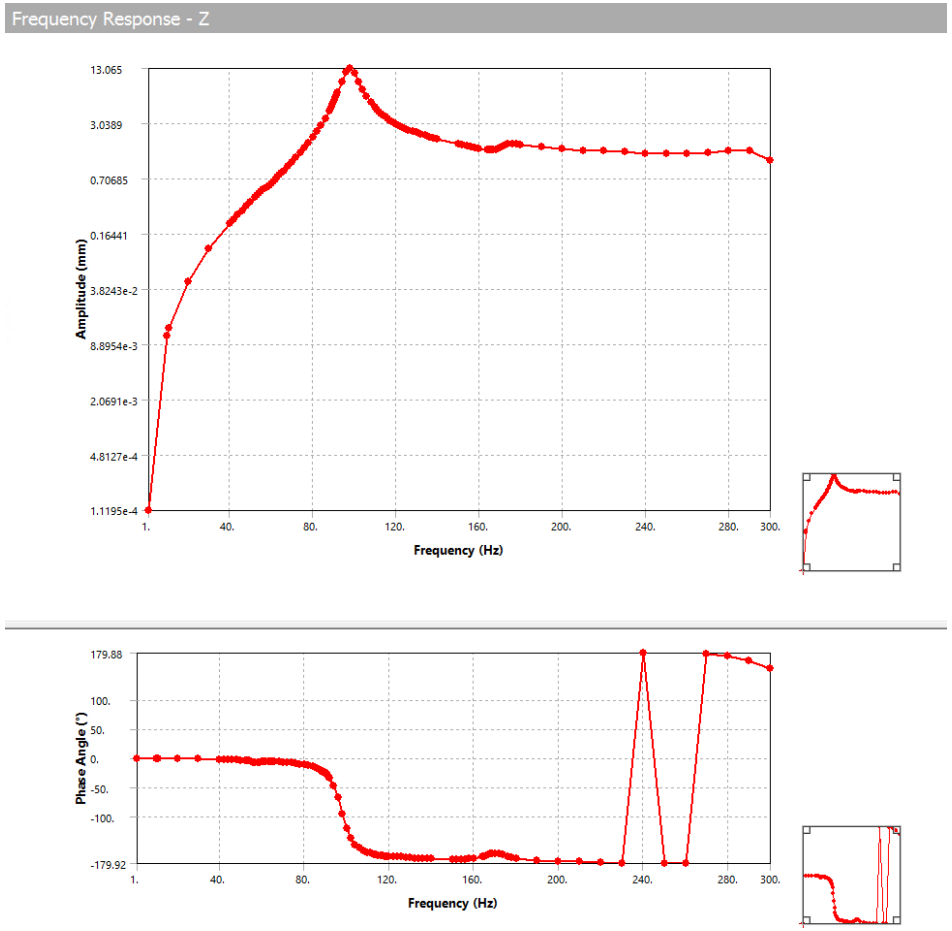


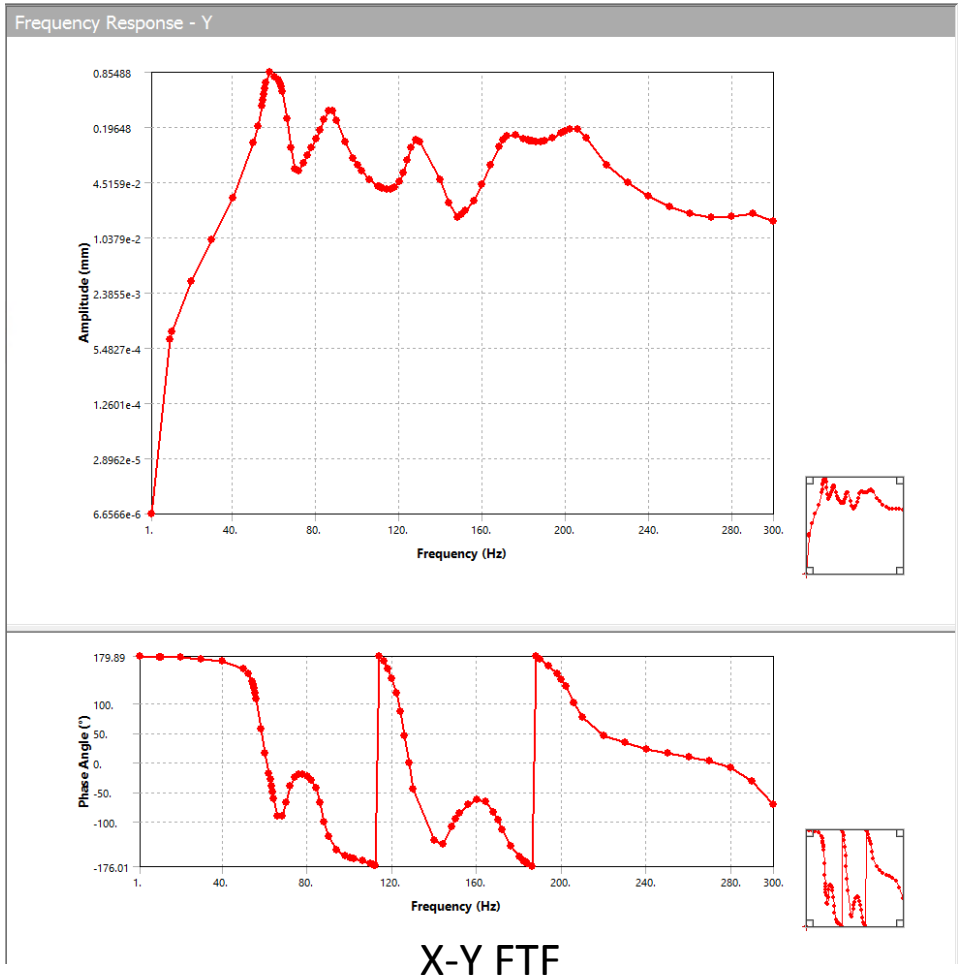
FIG. 14. Luminosity $\mathcal{L}$ vs collider number for 100 tuned colliders with static imperfections: with ground motion (orange square) and without ground motion (blue circle). Colliders are ordered in ascending luminosity using the colliders without ground motion.

Taken from: *Luminosity performance of the Compact Linear Collider at 380 GeV with static and dynamic imperfections* - *C. Gohil ,1,2,† P. N. Burrows ,1 N. Blaskovic Kraljevic ,2,A. Latina,2 J. Ögren ,2 and D. Schulte2*

Transfer Functions

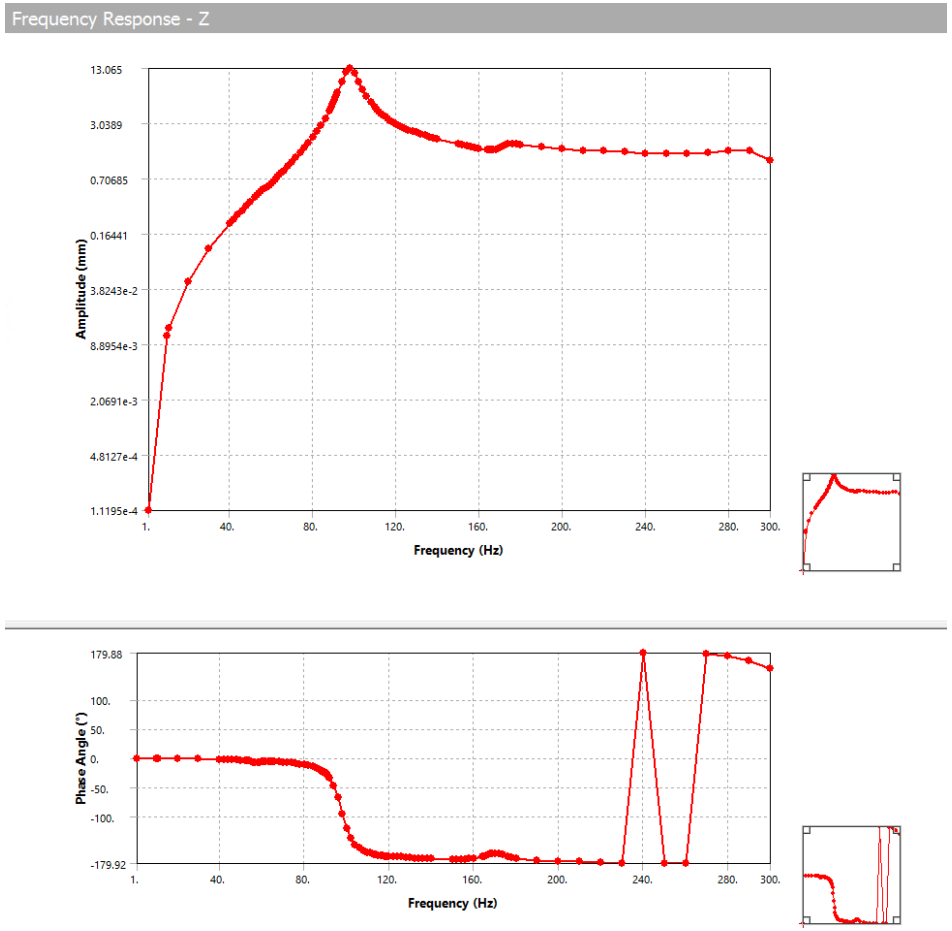


Z-Z FTF



X-Y FTF

Transfer Functions



Z-Z FTF

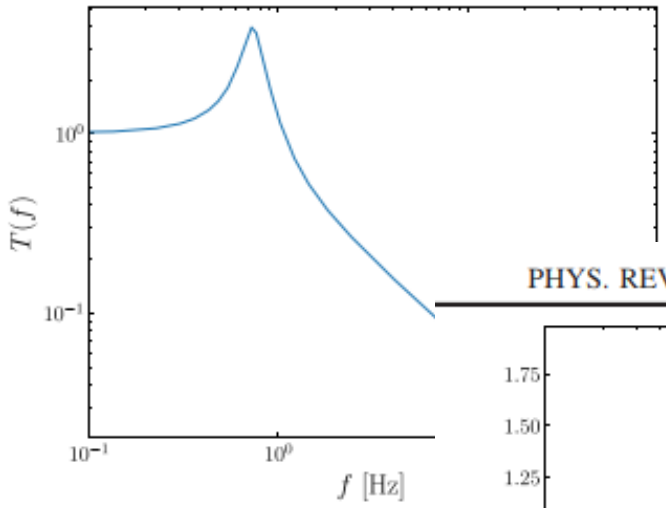


FIG. 13. Transfer function $T(f)$ vs freq
pole stabilization system [39].

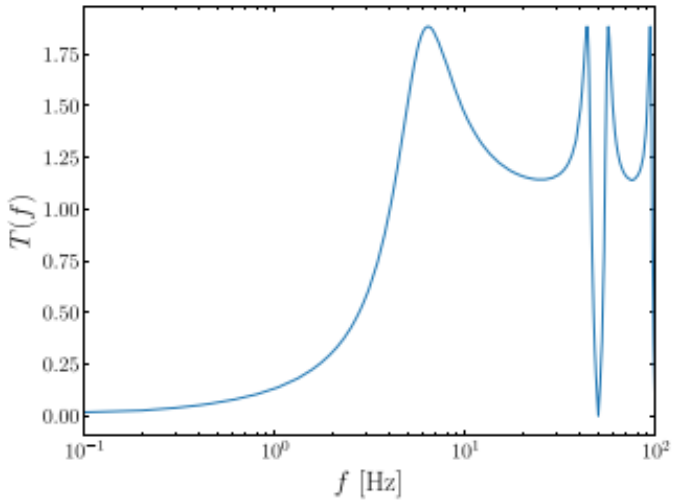


FIG. 12. Transfer function $T(f)$ vs frequency f for the beam-based feedback system used in CLIC.

Actuator Stiffness

- Axial stiffness of the linear actuators is 100-160N/µm
- This is currently the limiting factor