

# Leo Bellatoni

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I spent some time thinking about a single ellipsoidal cavity in a transversely mounted sorta-like a TM<sub>010</sub> mode. The idea is to pick up extra luminosity by being down at a lower frequency - I pick 200MHz - and to not have the transverse short-range wakefields that you will get with the traditional elliptical design. Furthermore, by going for an ellipsoid of short length, you avoid multipacting and keep the added beam-beam interaction to a minimum. And you would not need magnets to separate the beams in order to squeeze the cavities in between the beamlines.

The pitfall of the scheme is, as Rama pointed out, that there are modes with high R/Q that will generate large long-range wakes. I haven't done the damping requirement calculation - most of this is still not very quantitative - but I would not be surprised to get required  $Q_{ext}$  values on the order of 100 or less. That's gonna be not-easy.

So I'd like to think about pushing the envelope further, and trying to tune out these modes rather than to damp them. With this relatively simple geometry maybe it would be possible to dimple the surface of the ellipsoid in certain spots that would change some modes and not bother the fundamental. This would be a big deal if we could do it. But I do not have a good idea of how to build such a tuner. I have a picture of how a certain tuner was built for a round JLab cavity made out of Cu, but how would that work for Cu/Nb? Imagine some small cylinder mounted on the wall that can be driven into or out of the cavity. In terms of geometry, that would do the trick. But one needs to maintain superconductivity across the face of the piston, right? Do you know how tuning is done for Cu/Nb cavities now?