No Octupole Valley

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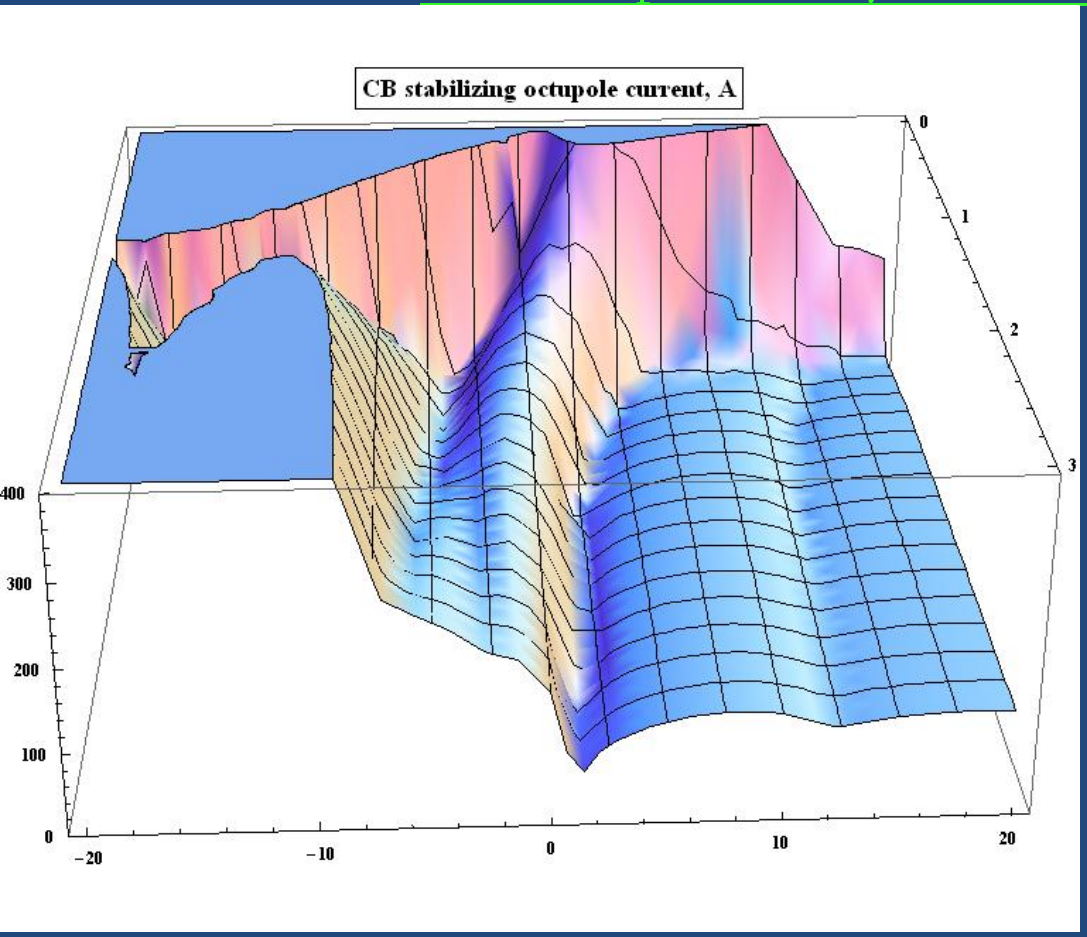
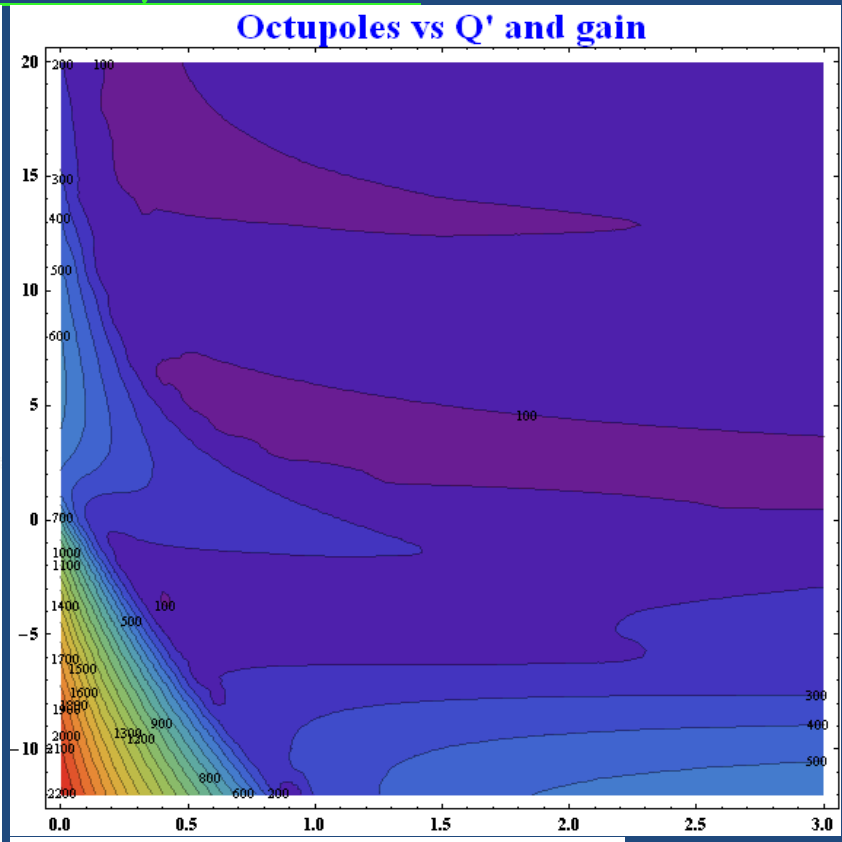
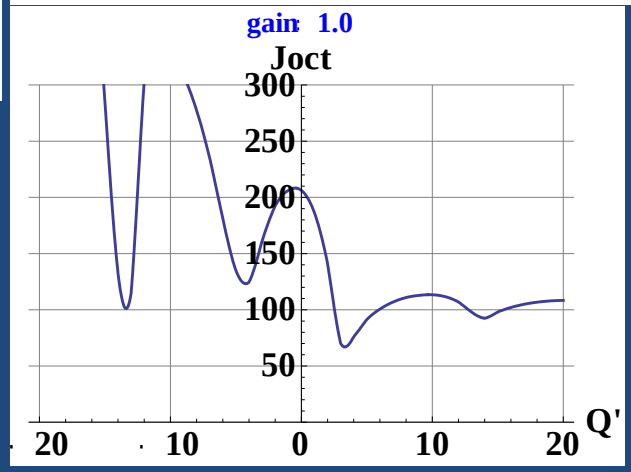
2 ⊗ Impedance, Flat Gain, Ioct<0:



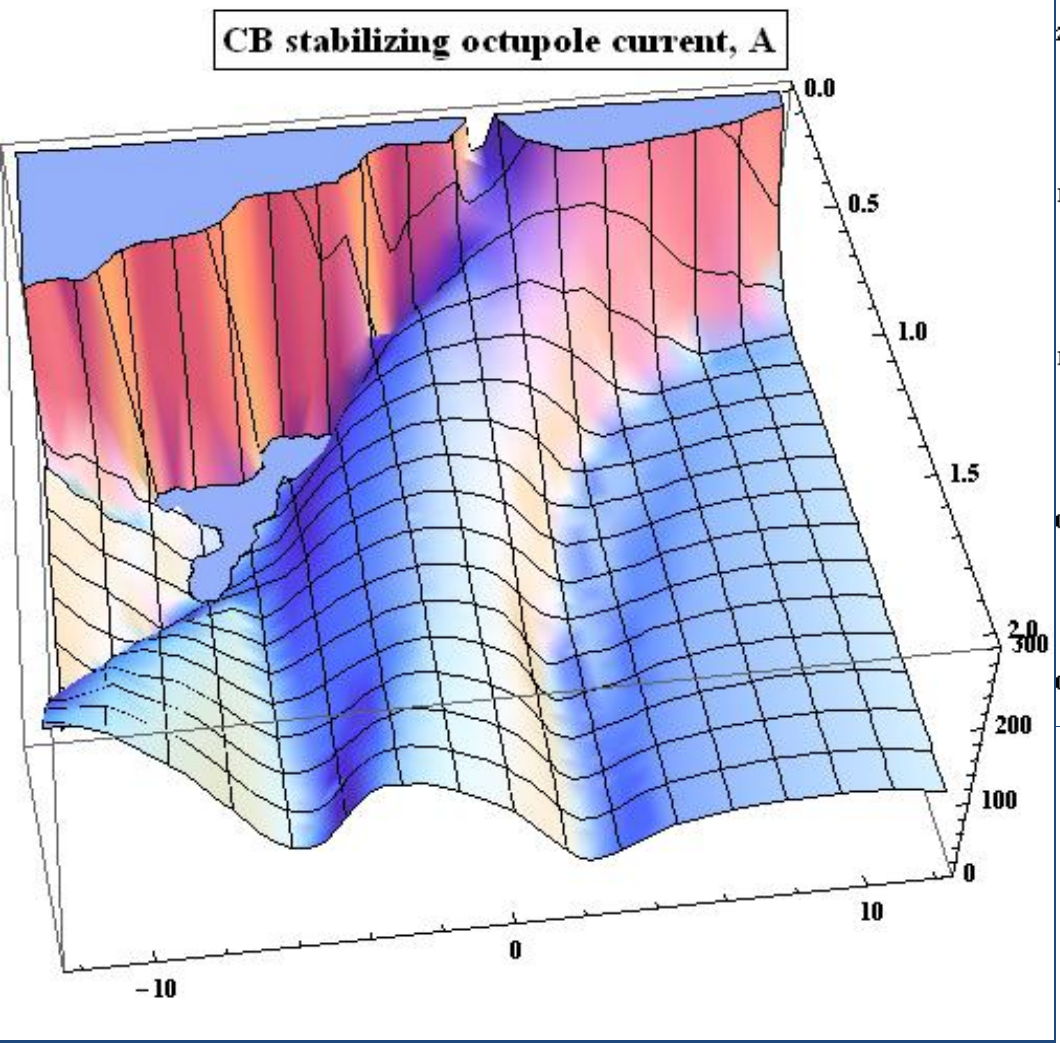


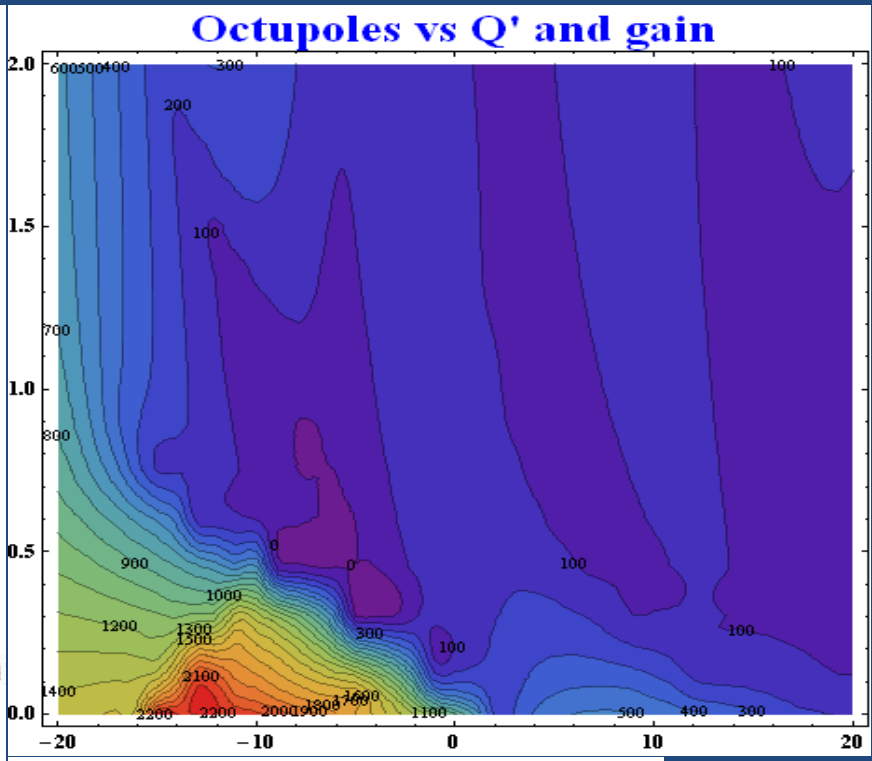


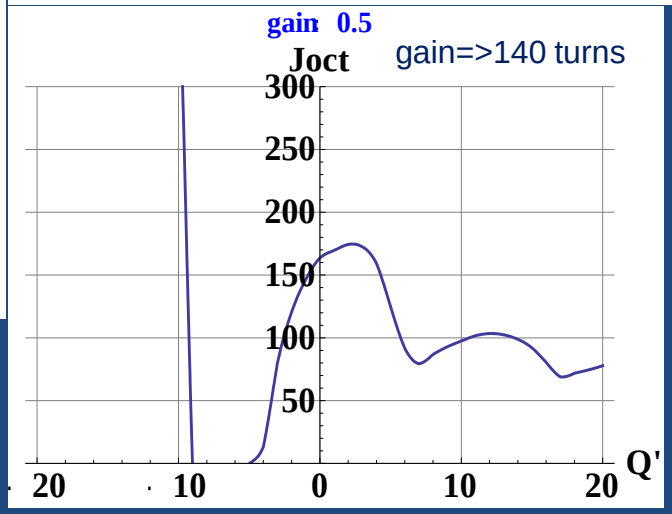
No difference with the “old” ADT
for $Q' \geq 10$, which is the best stability region.

Gain=1 => 70 turns of damping time

2*Impedance, gain dphase=+30 deg to foc, flat, Ioct<0







There is a small no-octupole valley for this mixed resistive-reactive flat damper.

Conclusions

- For a flat damper gain, valley of no-octupole stability does exist.

- It requires a mixed resistive-reactive phase. The optimal phase is computed to be ~ +30° towards reactive (i.e. more resistive than reactive).

- The valley is not so wide, so it requires a good accuracy of the chromaticity and gain settings.

- This valley does not depend on the fragile features of the Landau damping, since it assumes no Landau damping at all. Any natural nonlinearity may only make the valley wider.

- If Impedance exceeds twice the nominal, the valley disappears.