

2014 I: Q4 Quickie

(a.) $\zeta_E = \frac{W}{P}$ ← plasma stored energy
 ← ohmic heating power

$\frac{me^2}{t^2} \frac{-t^2}{me^2}$

$P = I_\phi V_\phi$

need Rogowski coil for I_ϕ

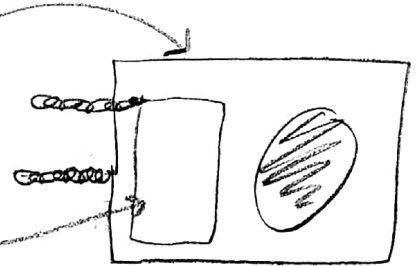


need toroidal loop for V_ϕ



$W \sim Vol \langle P \rangle$

$\langle P \rangle$ measured with diamagnetic loop and compensation coil



(b.) IF you add a beam $P = IU + P_{aux}$

So need to know P_{aux} .

Note: W increases, so ζ_E does not necessarily decrease.

Beams can distort velocity distribution or create anisotropy ($P_\perp \neq P_\parallel$), which will induce errors in ζ_E measurement. IF these don't happen, the measurement is still accurate.