Net electromagnetic torque induced by multiple neighboring resonant magnetic perturbations[1] A.J. COLE, C.C. HEGNA, J.D. CALLEN, University of Wisconsin — In this work, previous calculations [1,2] of the electromagnetic torque exerted by coupled resonant magnetic perturbations on a toroidal plasma are expanded to include many resonant surfaces in close proximity. We are interested in the possibility of a simplified torque expression in the limit that the distance between resonant surfaces collapses, i.e. as in the edge region where the q-profile is steep and their singular layers might overlap. Such a case is relevant to the ELM control community when resonant magnetic perturbation (RMP) fields are applied. Present analytic estimates of the shielding or penetration of an applied RMP field are done using single surface models, while in practice multiple neighboring resonances exist.

[1] J.W. Connor, S.C. Cowley, R.J. Hastie, et al., Phys. Fluids **31**, 577 (1988).
[2] R. Fitzpatrick, Phys. Plasmas **16**, 032502 (2009).

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