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RMP-Induced Plasma Transport Near X point[1] J.D. CALLEN, C.C. HEGNA, U. Wisconsin-Madison — The experimentally most noticeable effect of resonant magnetic perturbations (RMPs) on H-mode plasmas is "density pump-out." This effect is most evident in the near-separatrix region where RMPs can cause the electron density gradient there to decrease by a factor of up to two. The previously developed flutter model [1] produces some RMP-induced transport in this region. However, two other electron effects need to be taken into account in the X point region of the divertor separatrix. First, small 3D fields can cause significant (many cm) radial motion of field lines in "homoclinic tangles" very near the X point which have been observed experimentally in DIII-D. A flutter-type plasma transport model based on parallel electron collisional effects caused by RMP-induced "radial" motion of field lines away from the lowest order axisymmetric magnetic flux surfaces in the X point region is being developed. The second effect is that a small fraction of long length magnetic field lines in the near-separatrix region are "open" ones which are directly connected to material walls in the divertor region. Electrons on such field lines could conduct significant electron heat to the divertor plates.

[1] J.D. Callen, et al., Nucl. Fusion **53**, 113015 (2013).

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