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Divertor and X–Point MARFE Behavior in DIII–D H–mode Discharges,[1] T.W. PETRIE, A.W. LEONARD, M.A. MAHDAVI, W.P. WEST, General Atomics, S.L. ALLEN, M.E. FENSTERMACHER, D.N. HILL, C.J. LASNIER, R.D. WOOD, Lawrence Livermore National Laboratory, R. MAINGI, Oak Ridge Associated Universities, D.G. WHYTE, INRS–Energie et Materiaux — A detailed study of electron pressure balance inside and outside the separatrix-defined flux surface is examined during deuterium-induced radiative divertor operation. D_2 injection at a sufficiently high level triggers a high density, highly radiative region ("Divertor MARFE") in the SOL between the X–point and the outboard divertor strike point. Divertor MARFEs generally have only marginal adverse effects on H–mode conditions. With continued deuterium puffing, a high density, low temperature (≈5 eV) plasma forms *inside the separatrix* near the X–point ("X–point MARFE"). Concurrent with this is a degradation in both energy confinement and the plasma fueling rate. The formation of the X–point MARFE is consistent with a thermal instability resulting from the temperature dependence of the carbon radiative cooling rate in the range ≈7–30 eV. X–point MARFEing in both single-null and double-null configurations is discussed.

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