Impurity seeded discharges with confinement enhancements comparable to H-mode and reduced peak heat flux to plasma facing components have been observed in many devices, and these types of discharges may make an attractive fusion reactor scenario. In DIII-D, radiating mantle discharges with both an L-mode and ELMing H-mode edge have been obtained with a significant fraction of the input power, up to 80% in ELMing discharges, radiated inside the last closed flux surface, significantly reducing peak divertor heat fluxes.

After impurity injection into DIII-D ELMing H-mode discharges the ELM amplitude and frequency decrease. In addition, power and particle flows to the divertor, measured by Langmuir probes and an IRTV camera are also reduced. However, H-mode pedestal pressure is comparable to unseeded discharges, indicating that a good H-mode transport barrier is maintained.

DIII-D L-mode discharges have also been achieved with H-mode confinement factors, $H_{97Y}$, of approximately unity, both in diverted and limited configurations. In this case the onset of neon impurity puffing has led to a reduction in carbon influx and deuterium recycling, consistent with an increase in particle confinement time.

We will present conditions under which DIII-D impurity seeded discharges have been obtained and the limitations in sustaining these discharges. MIST modeling of impurity line radiation and edge impurity profiles will also be discussed.