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Particle transport in DIII-D plasmas[1] PETER KRESS, SASKIA MORDIJCK, William Mary Coll — By analyzing the plasma opacity and density evolution during the ELM cycle in DIII-D H-mode plasmas in which the amount of gas fueling was altered, we find evidence for an inward particle pinch at the plasma edge which seems to become more pronounced at higher density. Furthermore, at the plasma edge we find a correlation between the pedestal density and opacity, which measures neutral penetration depth. The changes in edge opacity during an ELM cycle were calculated by using a detailed time history of measured plasma profiles. At the same time, the density evolution during an ELM cycle was investigated. We find that if the edge density increases through an increase in gas fueling, then opacity increases and neutral fueling penetration depth decreases. We also find that density at the top of the pedestal recovers faster following an ELM when the overall density level is higher, leading to a hollow profile inside of the pedestal top. All these results indicate that there must be an inward particle pinch in the pedestal which will be crucial in the fueling of future burning plasma devices.

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