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Impact of target material on D and D_2 recycling in DIII-D ELMy H-mode discharges[1] IGOR BYKOV, ERIC HOLLMANN, DMITRY RUDAKOV, RICHARD MOYER, JOSE BOEDO, Univ of California - San Diego, RUI DIN, HUIQIAN WANG, ORAU, EZEKEAL UNTERBERG, ALEXIS BRIESEMEISTER, ORNL, CHRISTOPHER CHROBAK, TYLER ABRAMS, GA, JON WATKINS, SNL, CHARLES LASNIER, ADAM MCLEAN, LLNL — DIII-D operation with W divertor inserts shows molecular recycling flux (measured by Fulcher-a spectroscopy) is reduced between ELMs in comparison with a C divertor where the flux is dominated by D_2 molecules ($\geq$90%). This effect is partly explained by the higher reflection probability of atomic D on W. During ELMs, the molecular fraction drops by factor >2 on both C and W targets. To study the effect of higher ion impact energy (E_{imp}) on transient D re-emission during ELMs we have applied fast electrostatic bias to a DiMES probe equipped with a W and C sample set. A 50% increase of E_{imp} from ˜150 eV due to biasing led to transient increase of atomic D re-emission flux on both targets. Similar increase of the D_2 flux was only seen on C. Thus, the ratios of atomic and molecular fluxes on C varied in a similar way to those measured during ELMs. This variation in molecular recycling fraction with material has implications for the dynamics of density pedestal recovery between ELMs, the overall global particle balance of the system, and possibly the overall detachment onset conditions transiently due to the ELM particle influx.

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