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Impact of N_2 and Ne injection on partially detached divertor operation in JET H-mode plasmas[1] AARO JÄRVINEN, MATHIAS GROTH, Aalto University, SEBASTIJAN BREZINSEK, SVEN WIESEN, FZ-Juelich, CARINE GIROUD, COSTANZA MAGGI, GUY MATTHEWS, CCFE, BRUCE LIPSCHULTZ, University of York, AALTO UNIVERSITY COLLABORATION, FZ-JUELICH COLLABORATION, CCFE COLLABORATION, UNIVERSITY OF YORK COLLABORATION, JET CONTRIBUTORS TEAM — Partially detached divertor operation with N_2 and Ne injection in JET H-mode plasmas was experimentally investigated and simulated with EDGE2D-EIRENE in ITER-relevant, high-triangularity, vertical target configuration. The simulations reproduce the experimentally observed LFS heat and particle flux reduction with both N_2 and Ne radiation, when adjusting the impurity injection rate to reproduce the measurements of radiated power in the divertor. However, the simulations consistently underestimated the divertor D_α intensity by a factor of 3 - 5, indicating a shortfall in the radiation by fuel species. Whereas nitrogen radiation is concentrated in the divertor chamber in JET, neon radiation is predicted and measured to occur partially in the confined plasma. Therefore, neon injection is predicted to reduce the power crossing the separatrix in JET in partially detached divertor conditions.

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