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Broadening of the Power Fall-Off Length in a High Density, High Confinement H-mode Regime in ASDEX Upgrade MICHAEL FAITSCH, Max-Planck-Institute for Plasma Physics, Boltzmannstr. 2, D-85748 Garching, Germany, GEORG HARRER, Institute of Applied Physics, TU Wien, Fusion@OEAW, Wiedner Hauptstr. 8-10, 1040 Vienna, Austria, THOMAS EICH, ELISABETH WOLFRUM, MATTHIAS BERNERT, DOMINIK BRIDA, PIERRE DAVID, MIKE DUNNE, MICHAEL GRIENER, PETER MANZ, DAVIDE SILVAGNI, BALAZS TAL, ULRICH STROTH, Max-Planck-Institute for Plasma Physics, Boltzmannstr. 2, D-85748 Garching, Germany, THE EUROFUSION MST1 TEAM, THE ASDEX UPGRADE TEAM — Power exhaust solutions for a next-step device like ITER must be compatible with high plasma performance. In particular, a high separatrix density is necessary to achieve sufficiently low divertor power loading and type-I ELMs must be avoided or mitigated. Recent optimisation at ASDEX Upgrade has led to a regime highly suitable for power exhaust, combining high core performance with high separatrix density at high triangularity, close-to-double-null as foreseen for ITER. It is characterised by enhanced filamentary transport preventing type-I ELMs and leading to a quasi-continuous exhaust, with the interaction between filaments and divertor detachment still being an open point of research. While for type-I ELMs the whole pedestal is affected, here only the pedestal foot is altered. In this region nowadays machines match the collisionality for ITER in power exhaust compatible regimes. The most crucial power exhaust parameter, the power fall-off length, is shown to widen up to a factor of four w.r.t. the ITPA-multi-machine scaling.

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