Optimizing the pedestal radial flux to avoid impurity accumulation †

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We demonstrate that not only the impurity density in-out asymmetry, but also the poloidal impurity flow, have a major impact on the radial impurity flux direction. This realization provides the first method of measuring the radial impurity flux with available diagnostics, and without the need of a computationally demanding kinetic calculation of the full bulk ion response. Moreover, it affords insight into optimal tokamak operation to avoid impurity accumulation while improving fueling. Although the methodology is illustrated for simplicity in the large aspect ratio limit, it can be generalized to more realistic geometries to make more quantitative comparisons and predictions.

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