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## Preliminary Assessment of Tungsten as an Optional Plasma Facing Material in CFETR

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Since tungsten is considered as the optional divertor target material for the future fusion device, e.g. CFETR, it is crucial to keep this high-Z impurity concentration under an acceptable level to avoid significant degradation of core performance. In this work, a parameter scan study is performed to preliminarily assess the tungsten impurity. The OEDGE (OSM-EIRENE-DIVIMP) code package is employed, where OSM-EIRENE provides 2D scrape-off layer (SOL) plasma background, and DIVIMP code then simulates the impurity distribution. Instead of specifying the upstream condition, the target plasma parameters are scanned by assuming the heat load of the tungsten divertor lower than the engineering heat flux limit ( $10\text{MW}/\text{m}^2$ ). A large range of plasma profiles are sampled by the scan of the edge plasma temperature and density decay lengths, which are assigned based on empirical equations. The results reveal both the temperature and density decay lengths have a noteworthy effect on tungsten sputtering flux, divertor tungsten retention and core concentration. The impact of the poloidal drift velocity, radial pinch velocity and cross-field diffusion coefficient on the tungsten transport is also studied.

### Eligible for student paper award?

No

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