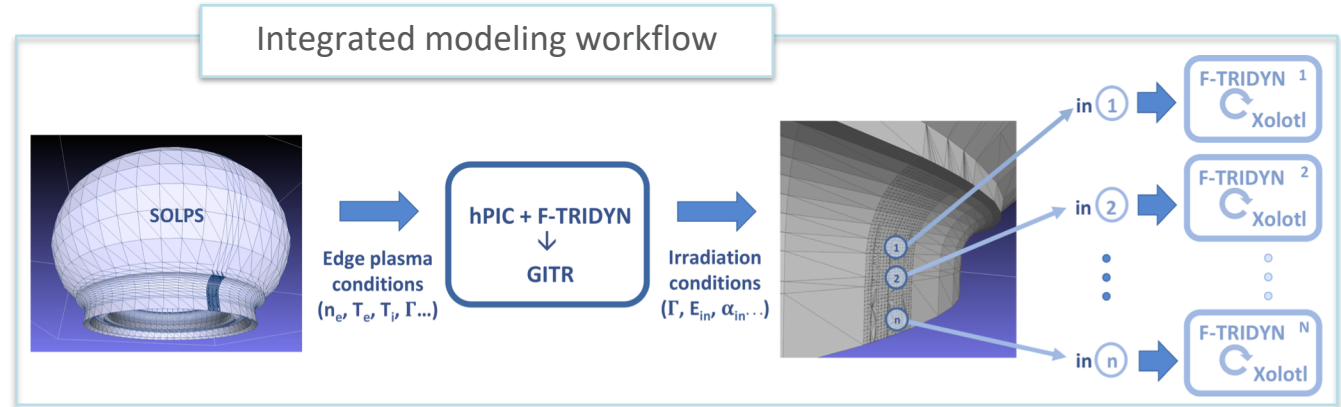


Validated Multi-Physics Model Predictions of Impurity Erosion, Re-deposition & Gas Retention in the ITER Divertor

- The integrated model (Fig.) was benchmarked against PISCES experiments



- Integrated modeling of the evolution of the ITER divertor reveals edge plasmas representative of partially detached divertors; significant contributions to W sputtering from light ions; strong W local/prompt redeposition; and sub-surface hydrogenic (D-T) gas dynamics dominated by heat fluxes & the presence of He
- Subsequent exposures to He plasmas and ITER Burning Plasma Operations show that D-T interact & bind with He-vacancy clusters, modifying retention & permeation: D-T content is set by pre-existing substrate damage; and gases remain closer to the surface in pre-damage substrates, while the bulk content is higher for initially pristine cases