# Kinetic Modeling of Impurity Transport using the IMPGYRO code

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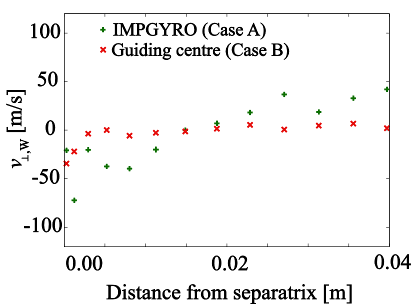
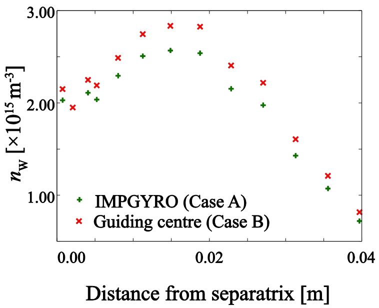
## Codes used: SOLPS-ITER (Background plasma) + IMPGYRO (W impurity transport)

- **Examine the effectiveness of the neoclassical self-diffusion process in a JT-60U geometry**




Imposed anomalous diffusion coefficient: $D_{an} = 0.3\ \mathrm{m}^2/s$

Actual diffusion coefficient calculated from $n_W V_{\perp,W} = -D_\perp \nabla_\perp n_W$

Full orbit calculation: $D_\perp \sim D_{an} + D_{neo} = 0.6\ \mathrm{m}^2/s$
Guiding centre approximation: $D_\perp \sim D_{an} \sim 0.28\ \mathrm{m}^2/s$

Neoclassical self-diffusion of impurities can be non-negligible compared to anomalous diffusion.

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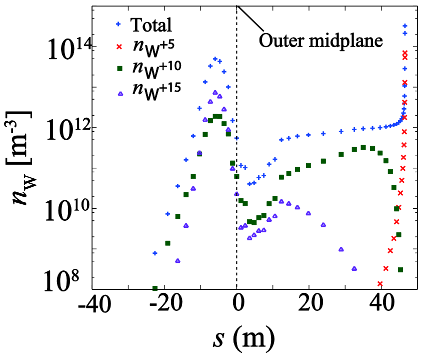
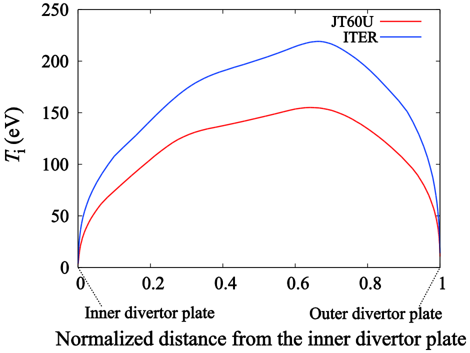
- **A first attempt to apply the IMPGYRO code to an ITER geometry**




W particles: Launched from the outer divertor

Near the divertor
– Pushed toward upper region of the SOL

Top region of the SOL
– Stagnate where $\nabla T \sim 0$ eV/m

Similar parallel transport process compared to JT-60U geometry
- Due to similar ion temperature profile