



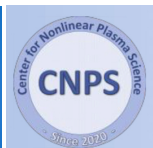
# 2024 WPSA Code Management Area Progress Meeting

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acknowledgements to ENR ATEP and TSVV 10 teams



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-deliver upgraded EP-WF/ATEP codes to deal with JT-60SA specific PNBI- and NNBI-generated distribution functions

done: extend WF to deal with various EP distribution functions

in progress: decide on how to handle multi-source distributions (same/different species)

-deliver benchmarked EP transport models (constant-amplitude and quasi-linear limit) for (one or various) JT-60SA scenarios

open: choose scenario, relying on available IMAS data, including ASCOT for benchmarking

# ATEP 3D solves EP transport equations in constants-of-motion space

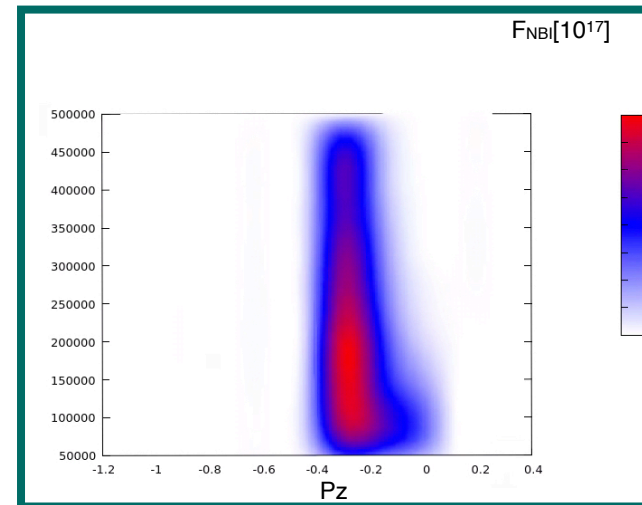
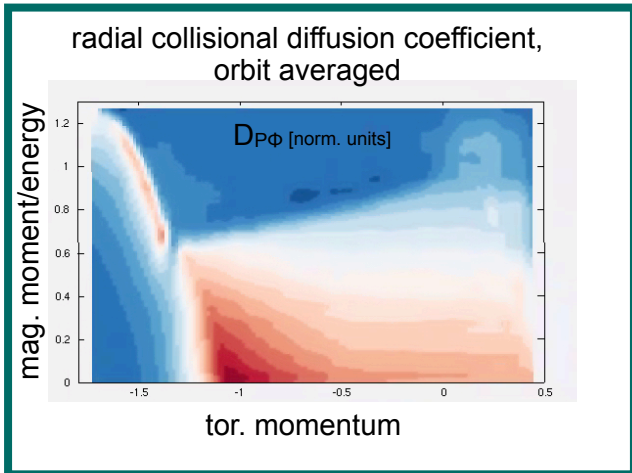
$$\frac{\partial}{\partial t} \overline{F_{z0}} + \frac{1}{\tau_b} \left[ \frac{\partial}{\partial P_\phi} \left( \overline{\tau_b \delta \dot{P}_\phi \delta F} \right)_z + \frac{\partial}{\partial \mathcal{E}} \left( \overline{\tau_b \delta \dot{\mathcal{E}} \delta F} \right)_z \right]_S = \left( \sum_b C_b^g [F, F_b] + S \right)_{zS}$$

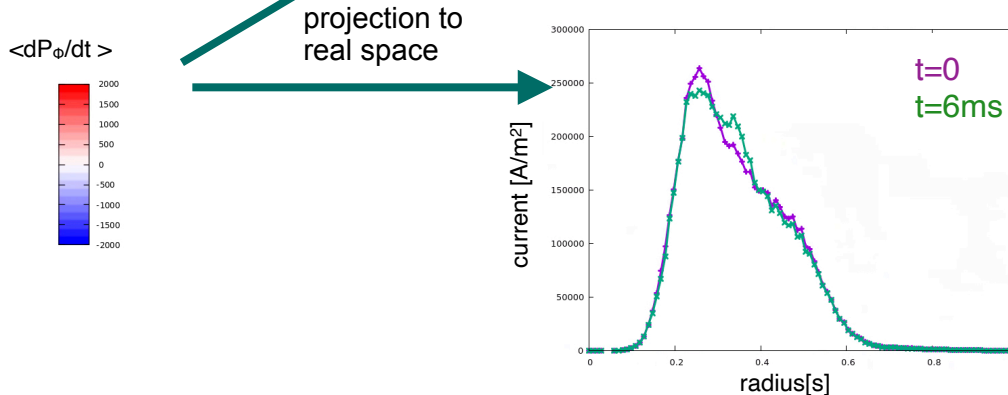
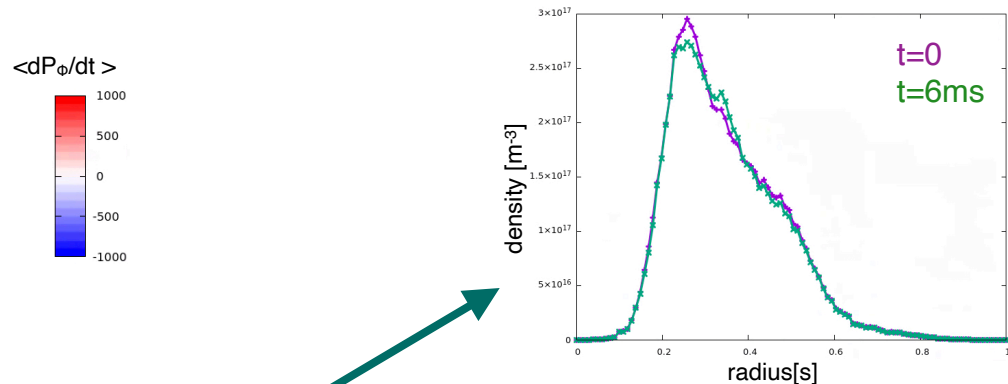
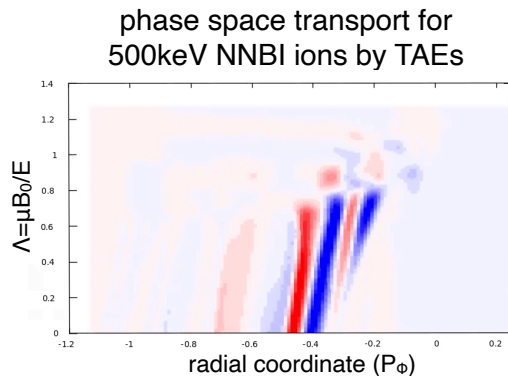
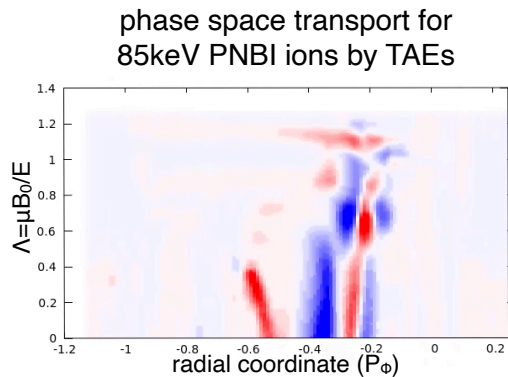
collisional transport + source

source +  
orbit averaged collision coefficients  
in 3D constants of motion space



slowing down distribution in  
constants of motion space





projection to  
real space

EP-workflow and ATEP codes ready for ramp-up studies, where current profile shaping is crucial for reaching specific hybrid or reversed shear scenarios, as described in the research plan