

# Alpha Particle Diagnostics Simulation

Topic Area:  
ModSim

Partner	Company
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## Project Summary:

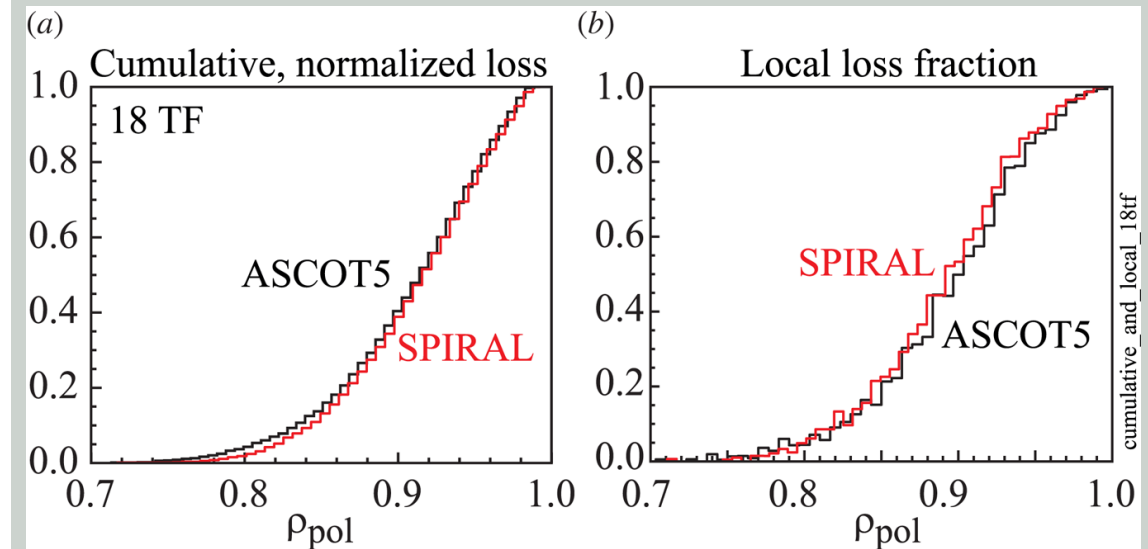
*Benchmark two leading fast-ion orbit-following simulation codes: SPIRAL and ASCOT5.*

## Fusion Impact:

*The project demonstrated stunning agreement between the codes: quantitative agreement on magnitude of alpha losses, their dependence on ripple, and their spatial dependence, but only after we identified and fixed problems in the pre-processors for both codes. We have much higher confidence in the code predictions.*

## Business/Market Impact:

*Code results have influenced the design of SPARC plasma-facing components*



Cumulative normalized power losses (left) and local power loss fraction (right) as function of the alpha birth  $\rho_{pol}$  (S. Scott et al, JPP **86** 2020).

Period of Performance:	Federal Share:	Cost Share:
3/2020 - 2/2021	\$60,000	\$15,000