Core-edge coupling in Tokamak RF simulation via the multido- 
main pseudospectral method

D.L. GREEN, L.A. BERRY, E.F. JAEGER, ORNL, RF-SCIDAC TEAM — The primary uncertainty in heating Tokamak plas- 
mas with RF power in the ICRF regime are the various linear and non-linear inter- 
actions of RF waves with the plasma edge. This will be of particular importance 
in ITER. The linear problem can be addressed by extending spectral full-wave core 
plasma calculations to the vessel wall. However, a uniform mesh of sufficient res- 
solution to resolve the fine scale antenna features is not tractable for the core hot 
plasma calculation, even on todays peta-scale supercomputers. To retain all rele- 
vant physics the core plasma calculation requires a pseudospectral (or collocation) 
method (PSM). As such, here we investigate the implementation of the multi-domain 
(MD) PSM to achieve a variable mesh, device geometry matching and tractable run- 
time. While the MD-PSM has been successfully employed for simple dielectrics and 
interfaces[1], its application to a hot plasma is complicated by the non-local plasma 
current. This prevents implementation of the standard MD patching boundary con- 
ditions. Here we discuss these complications and present progress towards a MD 
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D.L. Green
ORNL

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