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**Kinetic electron dynamics and short scales in gyrokinetic simulations** J. DOMINSKI, S. BRUNNER, EPFL CRPP, B.F. MCMILLAN, Warwick University, T.-M. TRAN, L. VILLARD, EPFL CRPP — A recent study [1] with the flux-tube version of the Eulerian gyrokinetic code GENE showed how turbulence transport, both in the ion temperature gradient and trapped electron mode regime, is affected by the presence of fine radial structures on the fluctuating fields. These structures are located near low order mode rational surfaces and result from the non-adiabatic response of passing electrons. This study has now been pursued in global geometry with the gyrokinetic particle-in-cell code ORB5, for which a new quasi-neutrality field solver, valid to all orders in $k_\perp \rho$ ($k_\perp$ the perpendicular wavenumber and $\rho$ the Larmor radius), has been implemented using a finite element method similar to Ref. [2]. The linearized polarization drift term in this solver appears as an integral operator, involving a phase space integration evaluated on an Eulerian grid.

[1] J Dominski et al., *Phys. Plasmas* **22**, 062303 (2015)
[2] A Mishchenko et al., *Phys. Plasmas* **12**, 062305 (2005)

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