# Calculation of stochastic thermal transport due to resonant magnetic perturbations in DIII-D

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**Abstract.** The effect of resonant magnetic perturbations on heat transport in DIII-D H-mode plasmas has been calculated by combining the TRIP3D field-line tracing code with the E3D two-fluid transport code. Simulations show that the divertor heat flux distribution becomes non-axisymmetric because heat flux is efficiently guided to the divertor along the three-dimensional invariant manifolds of the magnetic field. Calculations demonstrate that heat flux is spread over a wider area of the divertor target, thereby reducing the peak heat flux delivered during steady-state operation. Filtered optical cameras have observed non-axisymmetric particle fluxes at the strike-point and Langmuir probes have observed non-axisymmetric floating potentials. On the other hand, the predicted magnitude of stochastic thermal transport is too large to match the pedestal plasma profiles measured by Thomson scattering and charge exchange recombination spectroscopy. The Braginskii thermal conductivity overestimates the experimental heat transport in the pedestal because the mean free paths of both species are longer than estimates of the parallel thermal correlation lengths, and collisionless transport models are probably required for accurate description. However, even the collisionless estimates for electron thermal transport are too large by one to two orders of magnitude. Thus, it is likely that another mechanism such as rotational screening of resonant perturbations limits the stochastic region and reduces transport inside of the pedestal.

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