

Turbulence Update

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Turbulence Tools Update:

- STELLOPT compiles and runs on HPC at the WID
 - Outstanding issue: compile time is slow due to filesystem; problematic for development (repeated changes and compiling)
 - Admins have suggestions, willing to help resolve this issue
- Matt Landreman's geometry code being integrated into PTSM3D as a library
 - Renamed `vmec2sf1`
 - Read directly from VMEC file, rather than VMEC → GIST → PTSM3D
 - Allows for PTSM3D to be neatly packaged for implementation in ROSE

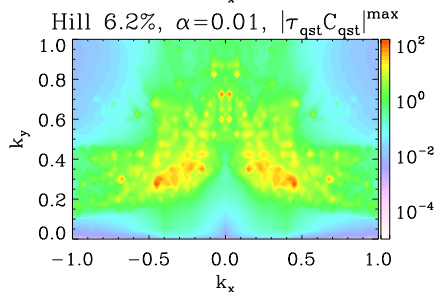
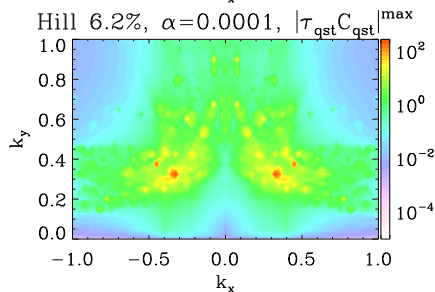
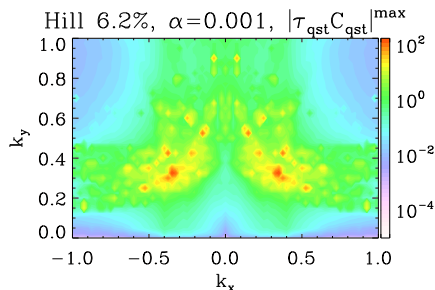
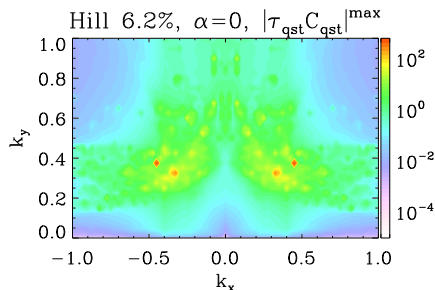
Turbulence Update

- Previous PTSM3D optimization calculations highly sensitive to resonances in triplet correlation times
- Apply resonance broadening in the form of an eddy damping term

$$\frac{1}{i(\omega_t(k'') + \omega_s(k') - \omega_p^*(k))} \Rightarrow \frac{1}{i(\omega_t(k'') - \Delta\omega(k'') + \omega_s(k') - \Delta\omega(k') - \omega_p^*(k) + \Delta\omega^*(k))}$$

where $\Delta\omega(k) = i\alpha(k_x^2 + k_y^2)$ and $\alpha \in \mathcal{R}$

Application to 6.2% Hill



Optimization

- 1 Calculation performed at Princeton
- Target PTSM3D: $1.88 \Rightarrow 3.09 \Rightarrow 15.5$
- Most PTSM3D targets: 2-2.5, suggest resonances
- Working to analyze if true
- Next things to do?