

# Effects of Magnetic Shear and Toroidal Rotation Shear on Turbulence Spreading

Non-local response of plasma profiles to sources, **mediated by turbulence spreading**, degrade confinement in the heating region.

An unstable region with same conditions

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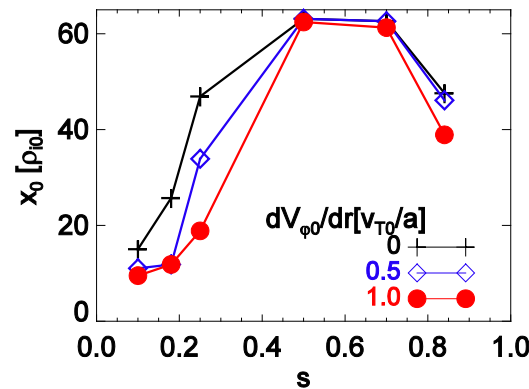
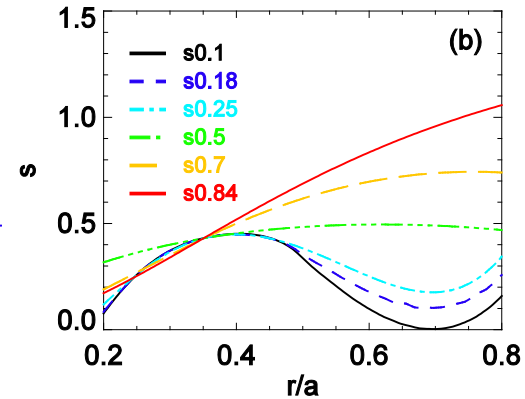
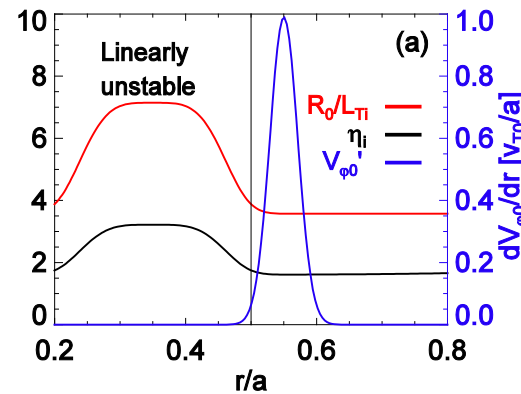
A damped region with different magnetic shear and external toroidal rotation shear

⇒ Effects on the nonlinear turbulence spreading and transport?

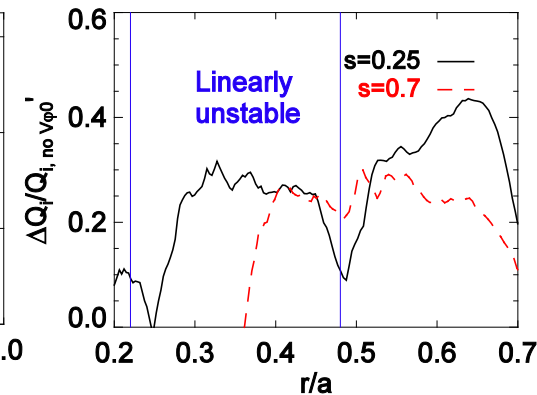
In the low magnetic shear cases of  $s < 0.3$ :

- Turbulence spreading decreases due to the increase in time required for the requisite nonlinear interactions.
- Additional suppression of the spreading by rotation shear
- The reduction of heat flux is more prominent, compared to the high shear case.

⇒ The combined effect of low magnetic shear and high rotational shear is shown to promote locality, as well as stability.



Penetration depth into the linearly stable region



Decrease in heat flux  
 $\Delta Q_i = Q_{i, no V_{\phi 0}'} - Q_{i, V_{\phi 0}'=1.0}$