Combustion Chambers: Bottom line

Ideal flow pattern:

Fuel

Oxidant

PSR

PFR

'perfect' axial and radial mixing...

'perfect' radial mixing, no axial mixing...

PFR

Flame stability

PSR region needed for ignition, etc.
(e.g., product recirculation)

PFR section needed for minimum combustion size

Area of

Size of PSR

\(-\frac{1}{F_A}\)

0 \(X_A\) \(X_{AF}\)

Size of PFR

\(-\frac{1}{F_A}\)

0 \(X_A\) \(X_{AF}\)

PSR + PFR (in series)

Combustion minimizes chamber size!!