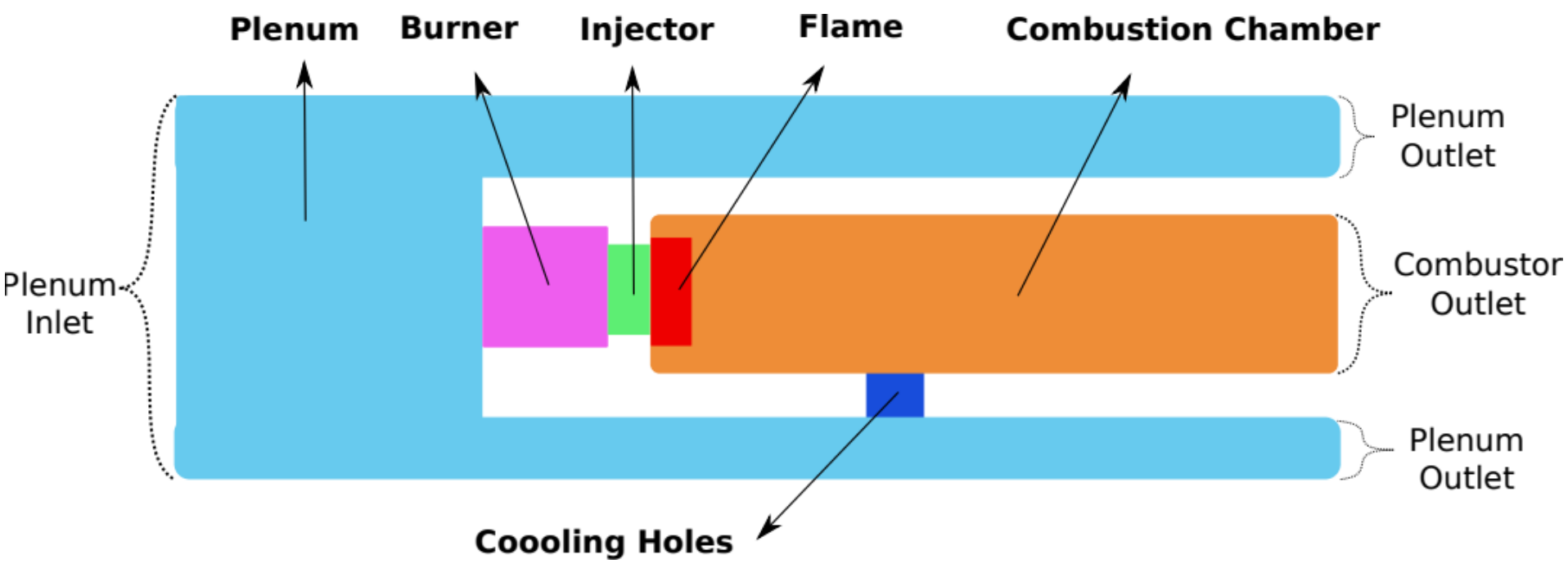
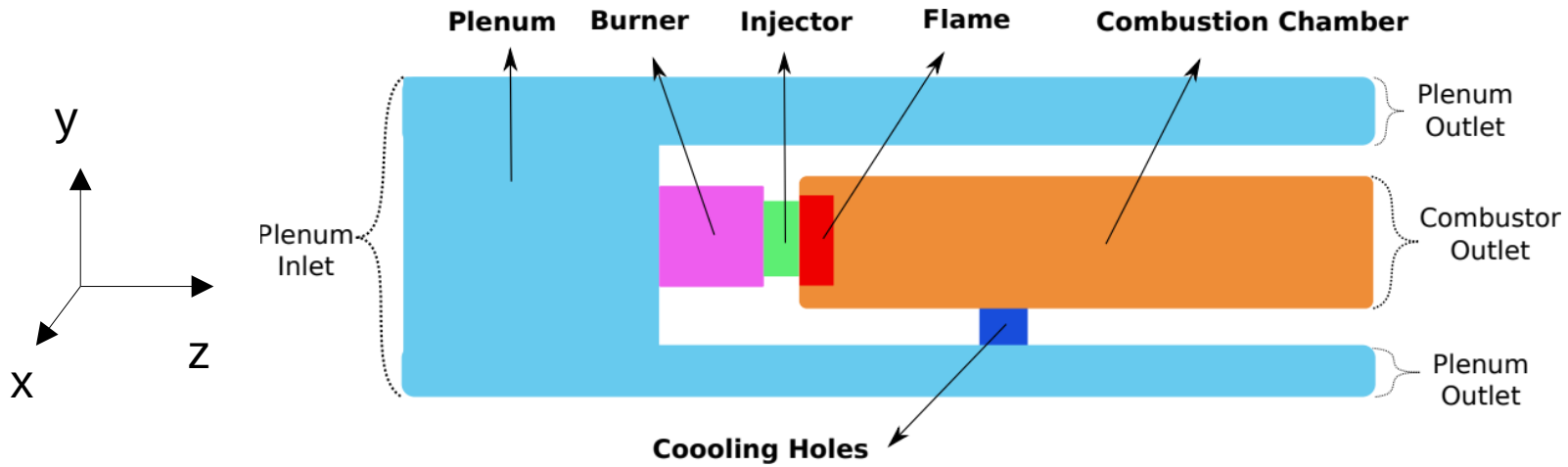
31 MARCH 2022

Combustor Geometry



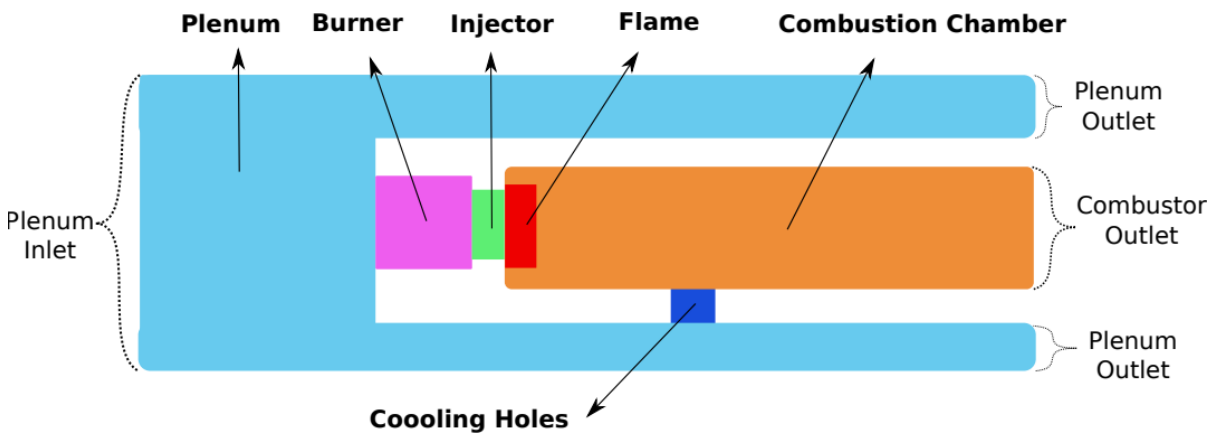


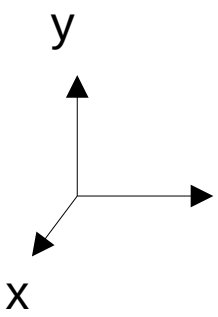
R_burner	0.018	L_burner	0.08
R_injector	0.01	L_flame	0.03
R_plenum_inner	0.1	L_cc	0.24
R_plenum_outer	0.22	L_injector	0.02
R_air_admission_inner	0.11	L_plenum_inlet	0.14
R_air_admission_outer	0.20	R_air_hole	0.01
R_cc_inner	0.12	L_air_hole	0.005
R_cc_outer	0.19	Sector	20pcs
R_flame	0.02	z_air_hole	L_cc*2/5

All dimensions are in **meter**

Parameters

Parameter	Value	Unit
U_bulk	18	m/s
z_flame	0	m
z_ref	-0.1	m
rho_air	1.22	kg/m3
gamma	1.4	--
Q_per_burner	800	kW
N	1	
tau	0.003	s





Eigenmodes (P_1 and P_2)

- Total number of cells is 139425
- Total calculation took 5 hours and 5 minutes.
- Just 1 core is used

Direct Eigenvalues

$\omega_{1_{dir}}$ = 2380.5954-14.69j

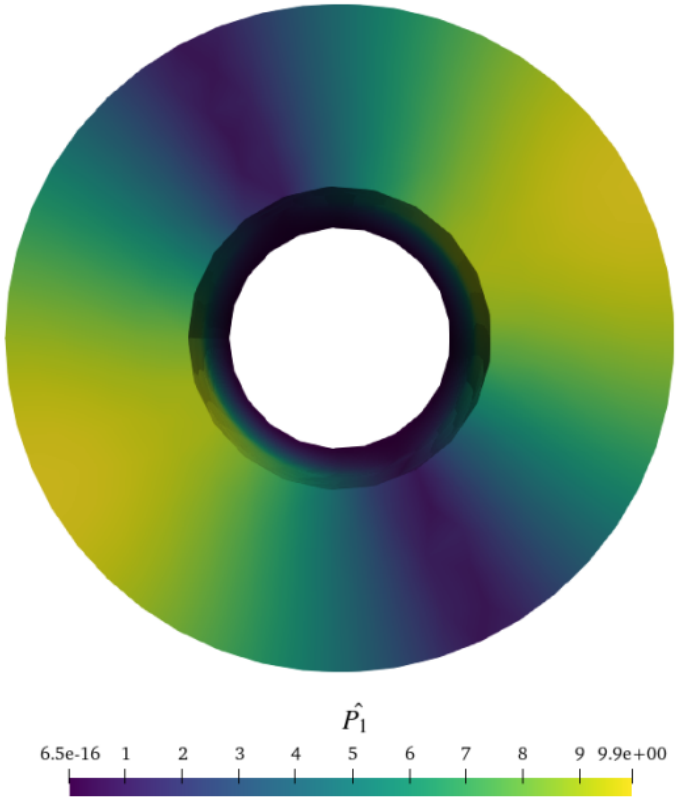
$\omega_{2_{dir}}$ = 2380.4912-15.55j

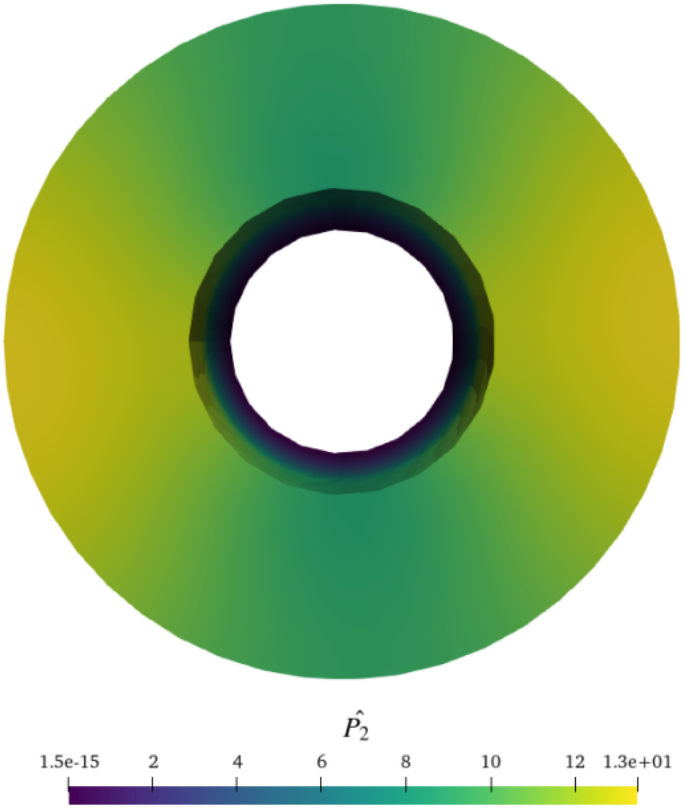
Adjoint Eigenvalues

$\omega_{1_{adj}}$ = 2380.5954+14.69j

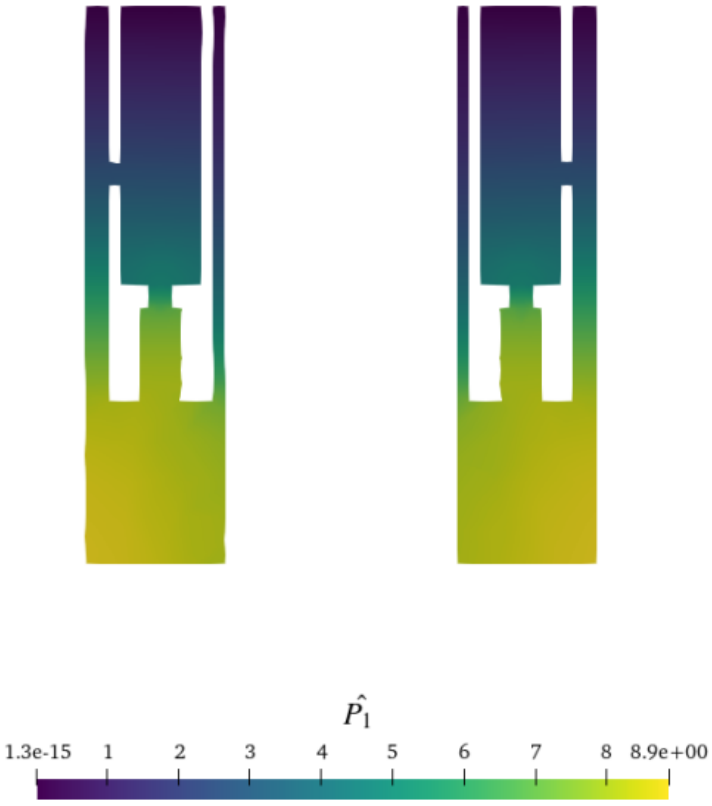
$\omega_{2_{adj}}$ = 2380.4912+15.55j

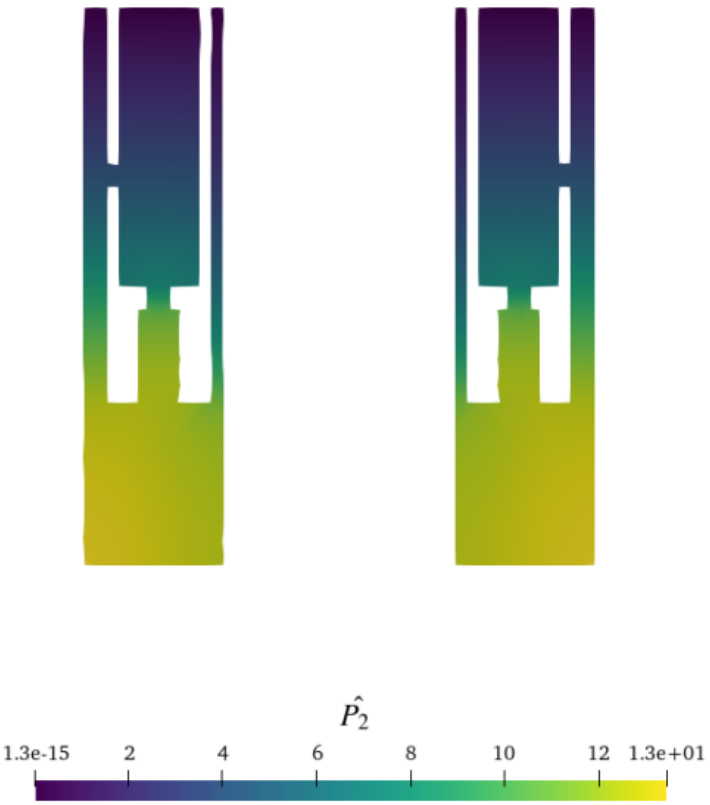
Eigenmodes (P_1 and P_2)



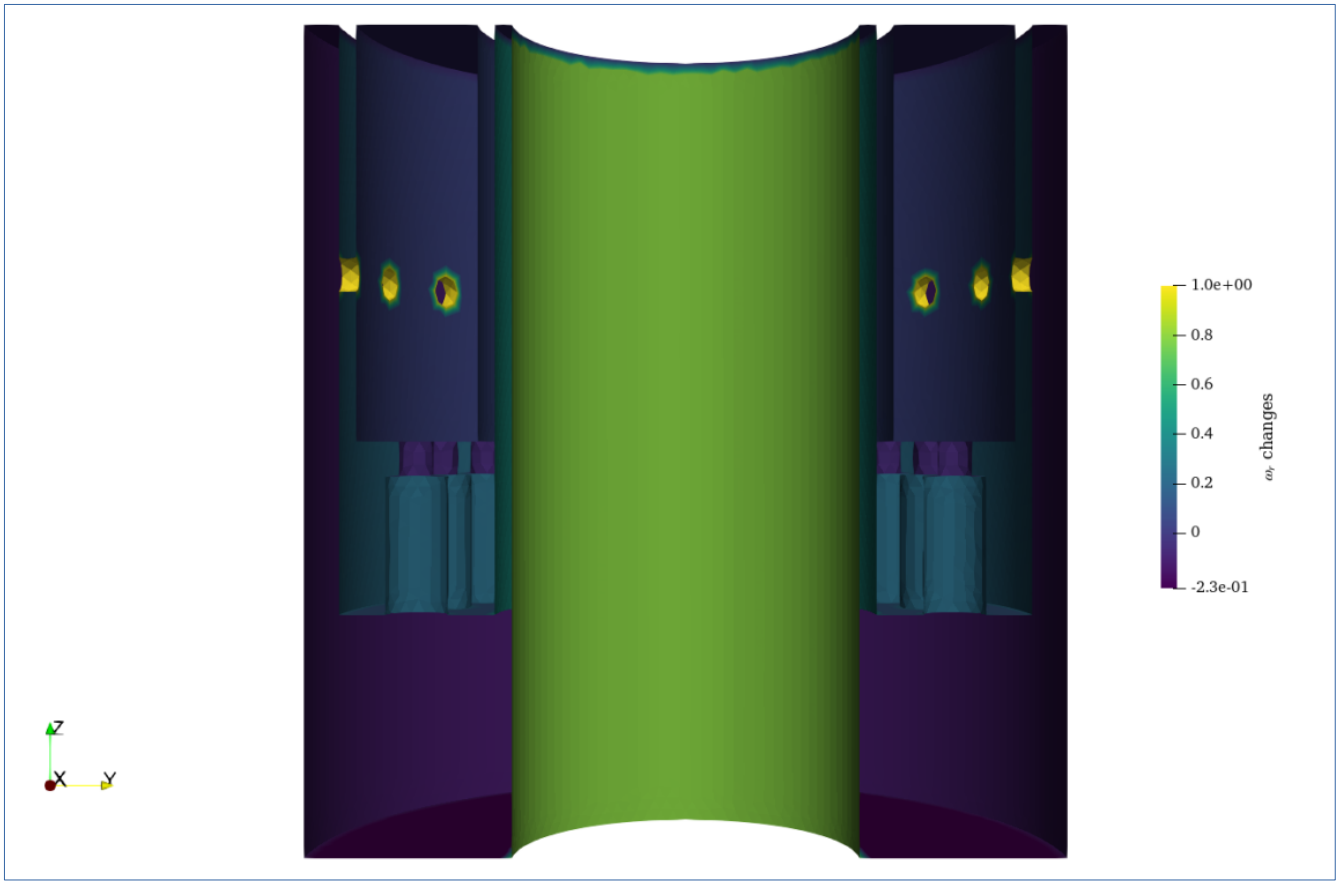


Eigenmodes (P_1 and P_2)





Shape Derivatives – Effect of Boundaries on Frequency



Shape Derivatives – Boundary Effects on Growth Rate