

SAMARA SEED 1x – NUMERICAL SIMULATION

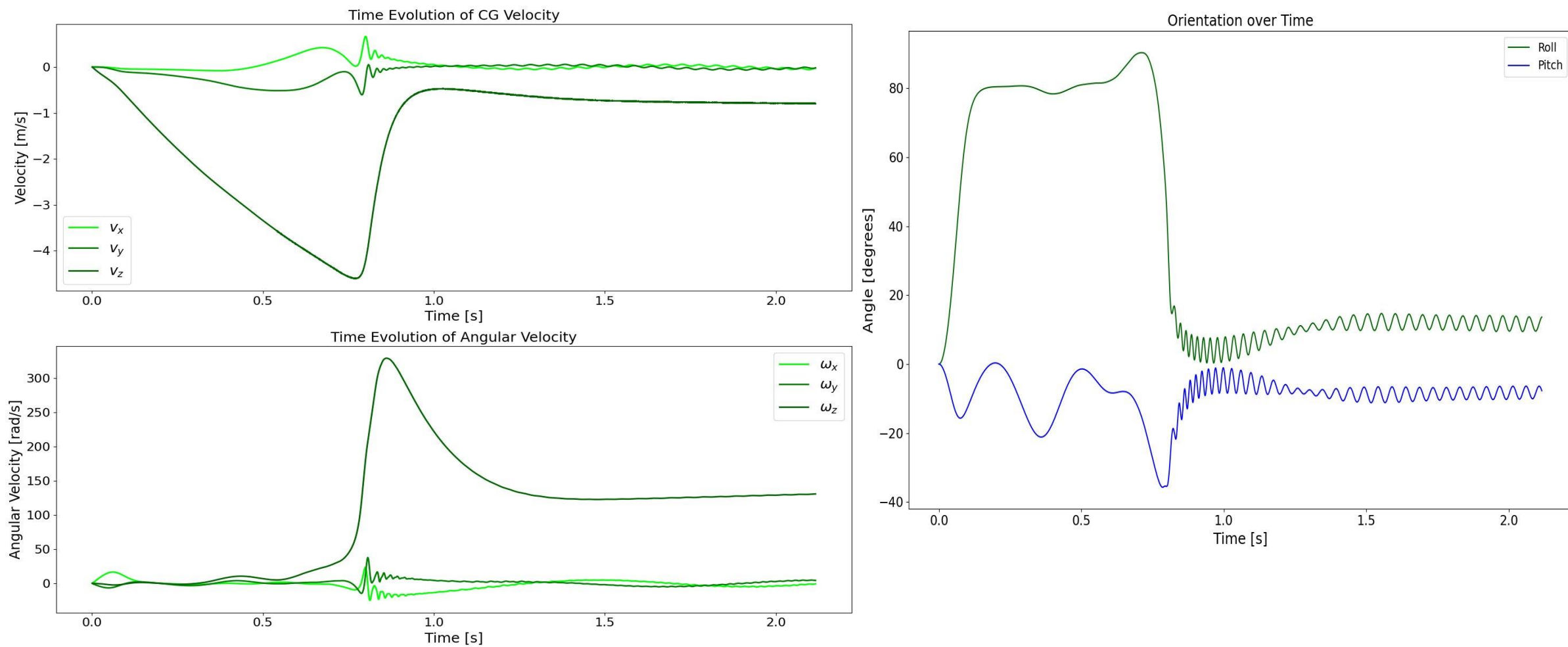


Fig. 1

SAMARA SEED 2x SCALED MODEL – NUMERICAL SIMULATION

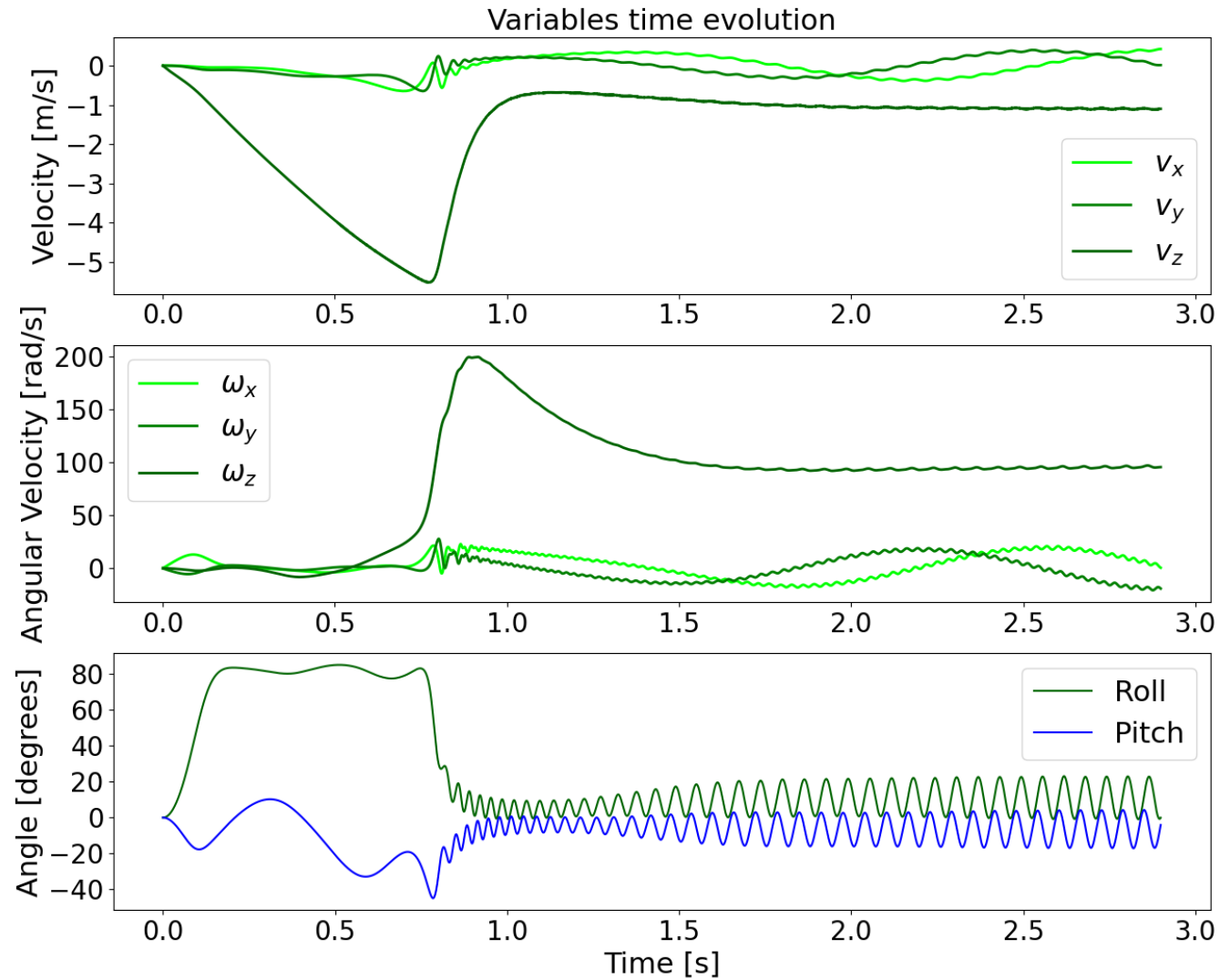


Fig. 2

SAMARA 1x, 2x QUANTITATIVE COMPARISON – NUMERICAL SIMULATION

KINEMATIC PROPERTIES

	Samara 1x	Samara 2x
β [deg]	11.6655 ± 1.6	10.9681 ± 8
θ [deg]	-8.5165 ± 1.2	-8.2639 ± 7
v_{tip} [m/s]	2.89	4.20
$\bar{v}_{res}$ [m/s]	1.1002	3.5549
ω_z [rad/s]	130 ± 0.3	96 ± 0.6
v_d [m/s]	-0.7927 ± 0.006	-1.1036 ± 0.01
h_{drop} [m]	2	2.4

Tab. 1

DYNAMICS PROPERTIES

	Samara 1x	Samara 2x
W [N]	0.0005399	0.0043362
F_x [N]	7.10e-07	-0.000465
F_y [N]	1.26e-05	0.000266
F_z [N]	0.000536	0.004268
M_x [Nm]	-8.39e-05	0.0002182
M_y [Nm]	-4.82e-05	0.001707
M_z [Nm]	1.26e-06	-8.89e-05

Tab. 2

CHIMERA PAYLOAD OPTIMIZATION – TRANSIENT VARIABLES COMPARISON

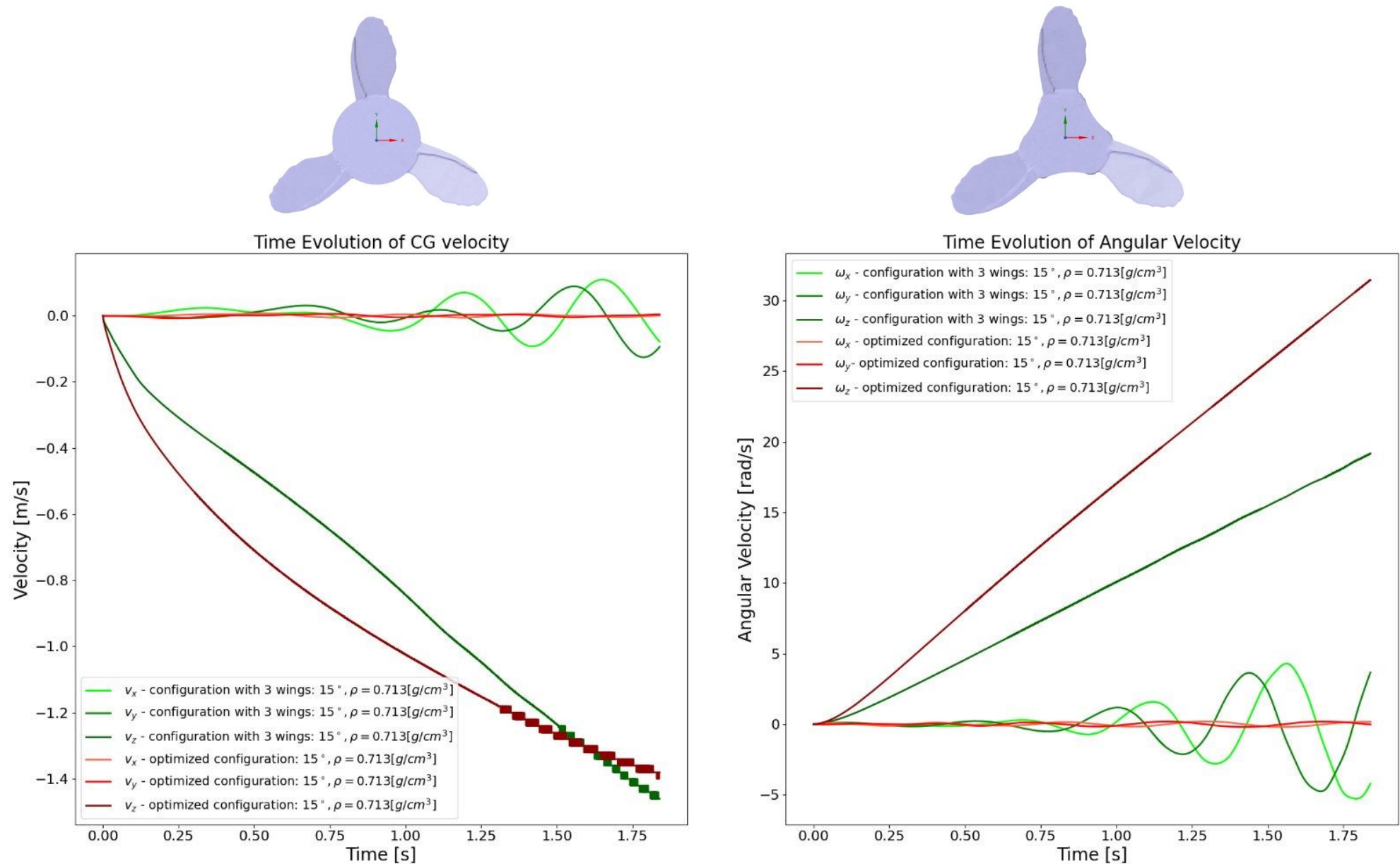
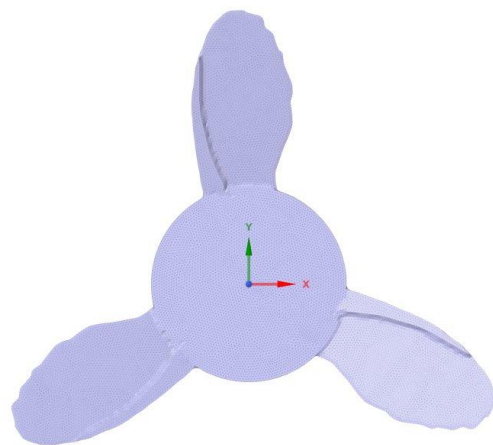
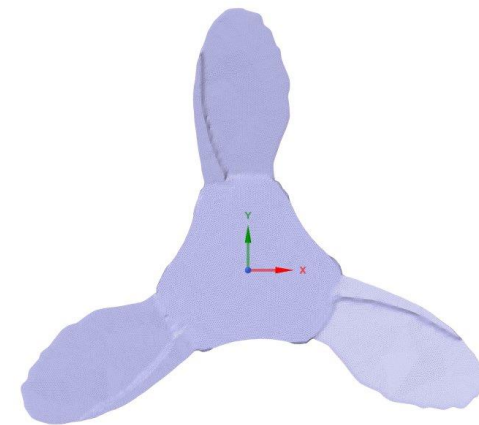
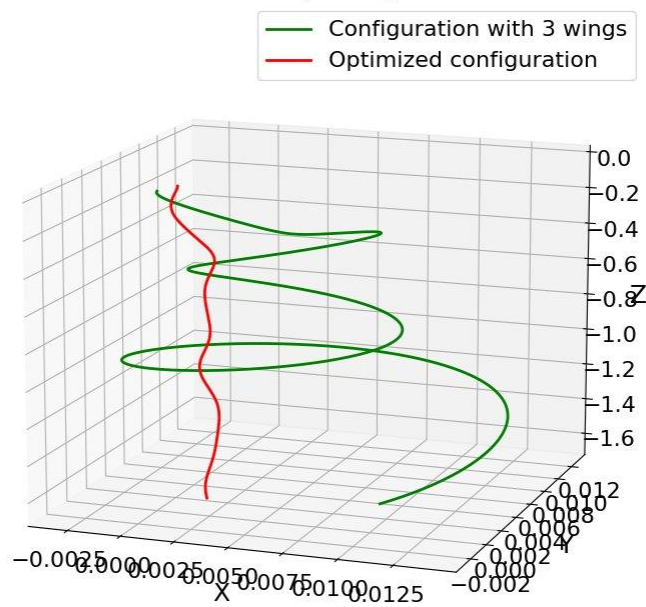


Fig. 3

CHIMERA PAYLOAD OPTIMIZATION – TRAJECTORIES



3D Trajectory



X-Y displacement of center of gravity

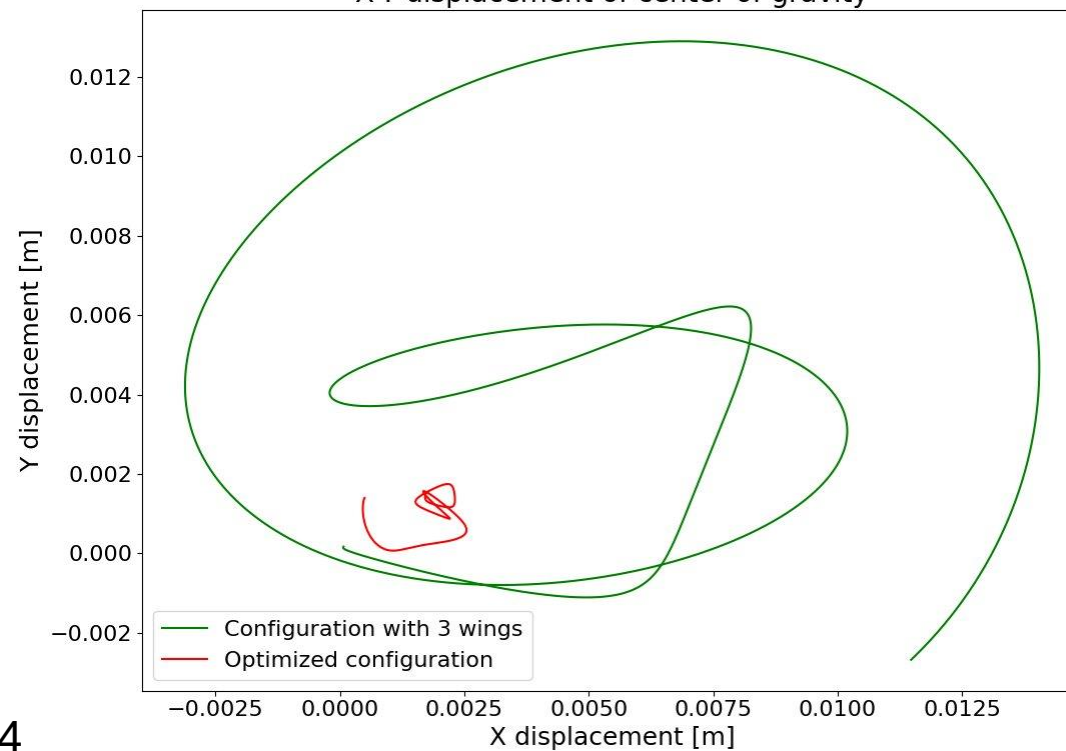


Fig. 4

CHIMERA WITH CONE – STABILITY ANALYSIS (Euler angles)

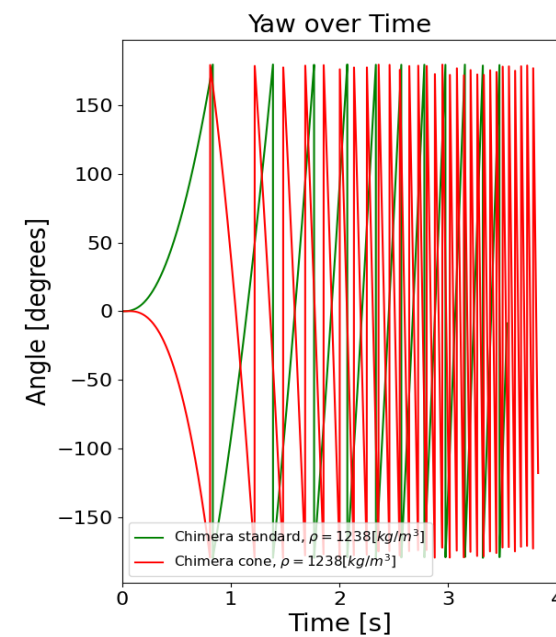
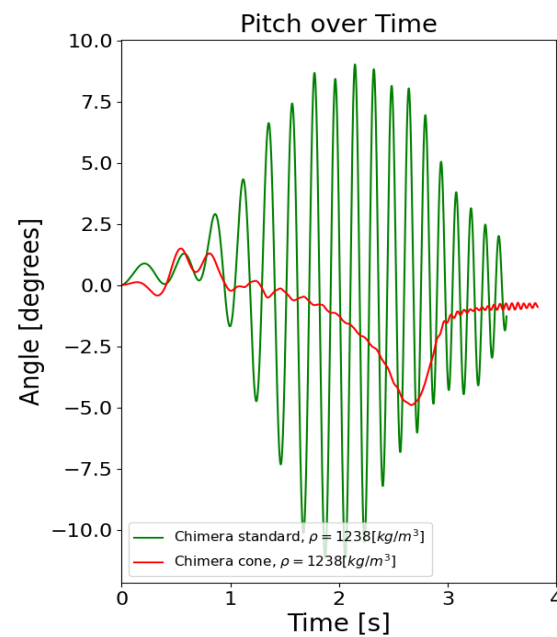
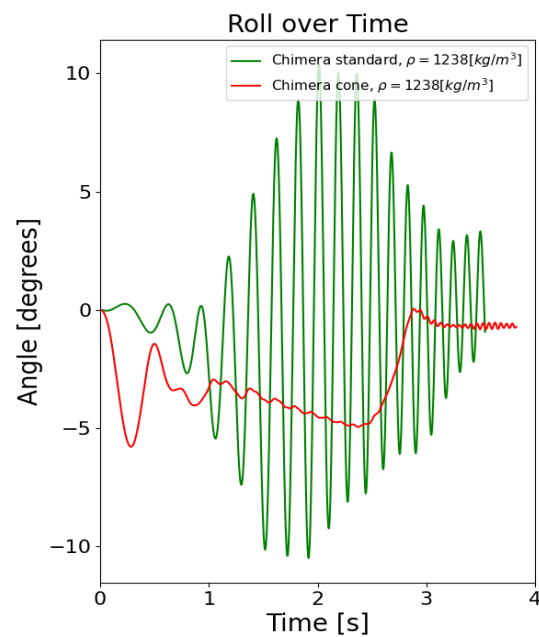
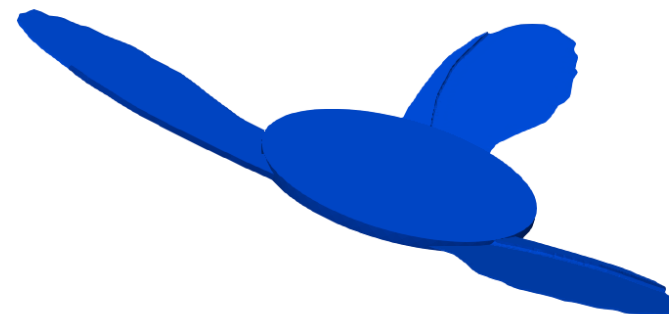
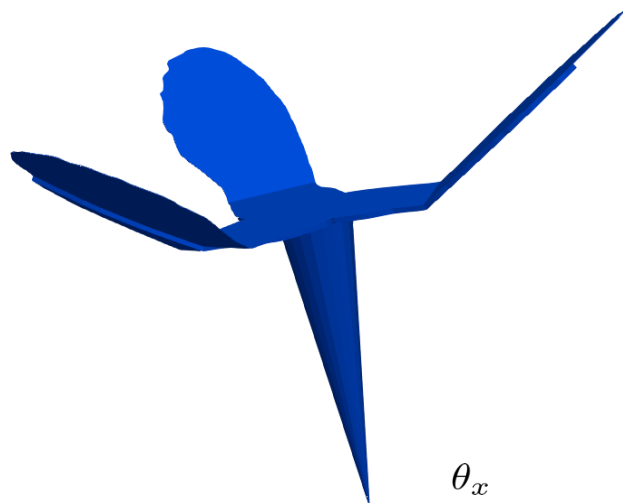


Fig. 5

CHIMERA WITH CONE – STABILITY ANALYSIS (Trajectories)

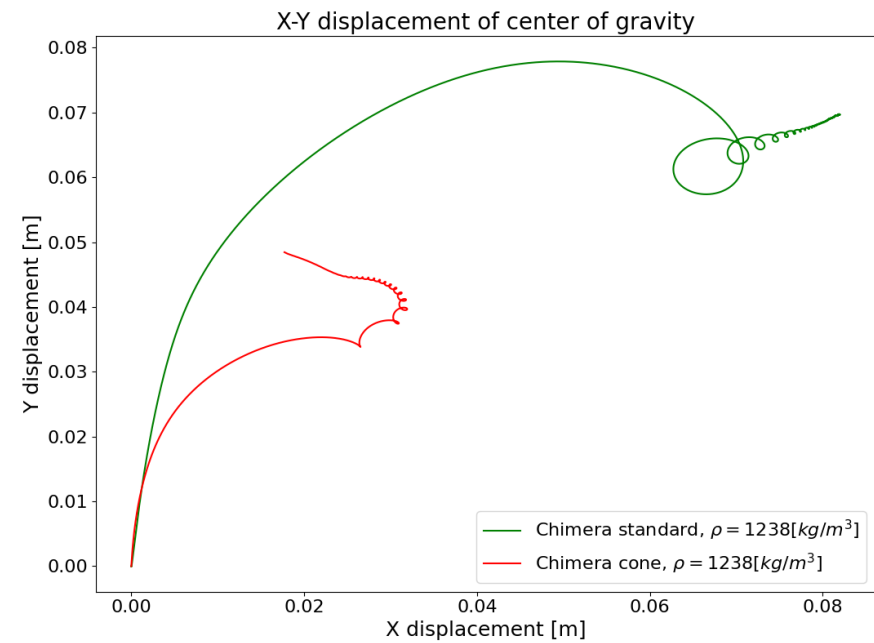
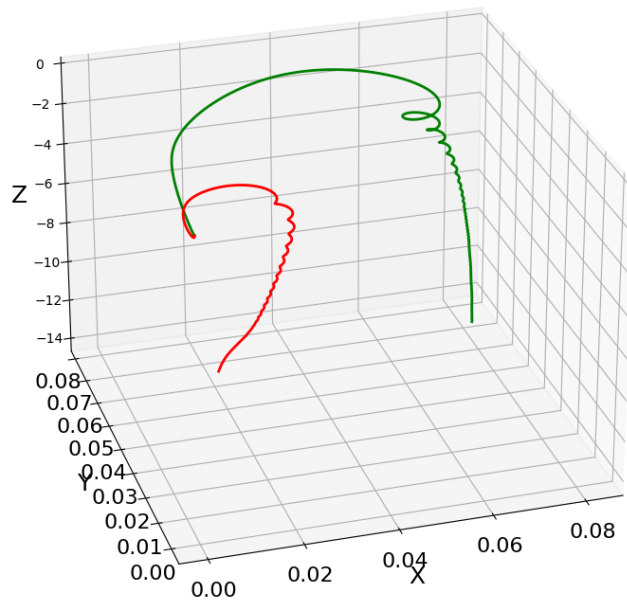
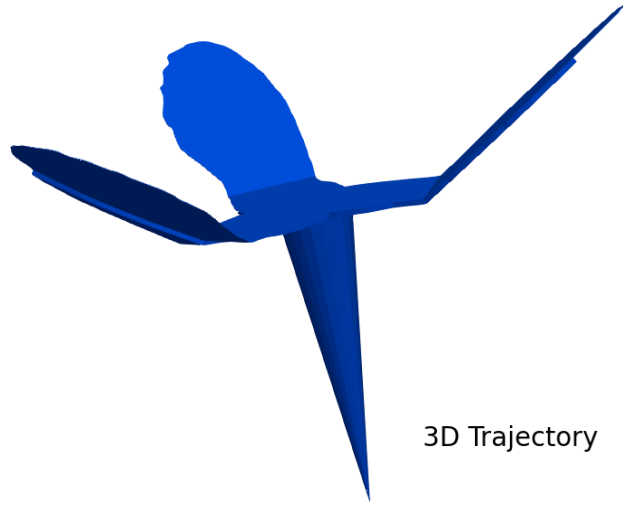
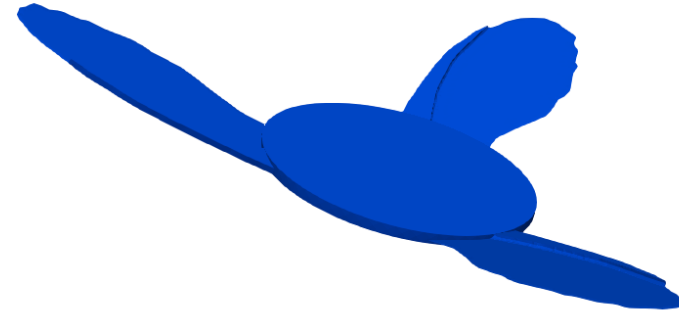


Fig. 6

CHIMERA WITH CONE – KINEMATICS VARIABLES QUANTIFICATION



	Chimera with cone	Chimera with disk
Descent velocity	-2.8400 m/s (std: 0.0327)	-1.8766 m/s (std: 0.0075)
Angular Velocity	-113.7824 rad/s (std: 0.5979)	74 rad/s (std: 0.3004)
θ_x	-0.6678 deg (std: 0.0705)	1.8141 deg (std: 1.3963)
θ_y	-0.8392 deg (std: 0.0680)	-1.0950 deg (std: 0.7838)

Tab. 3