Numerical Crash Simulation of the Reusability Flight Experiment ReFEx

Waldemar Bauer, Eduard Schnorr, Andreas Rittweger, Peter Rickmers

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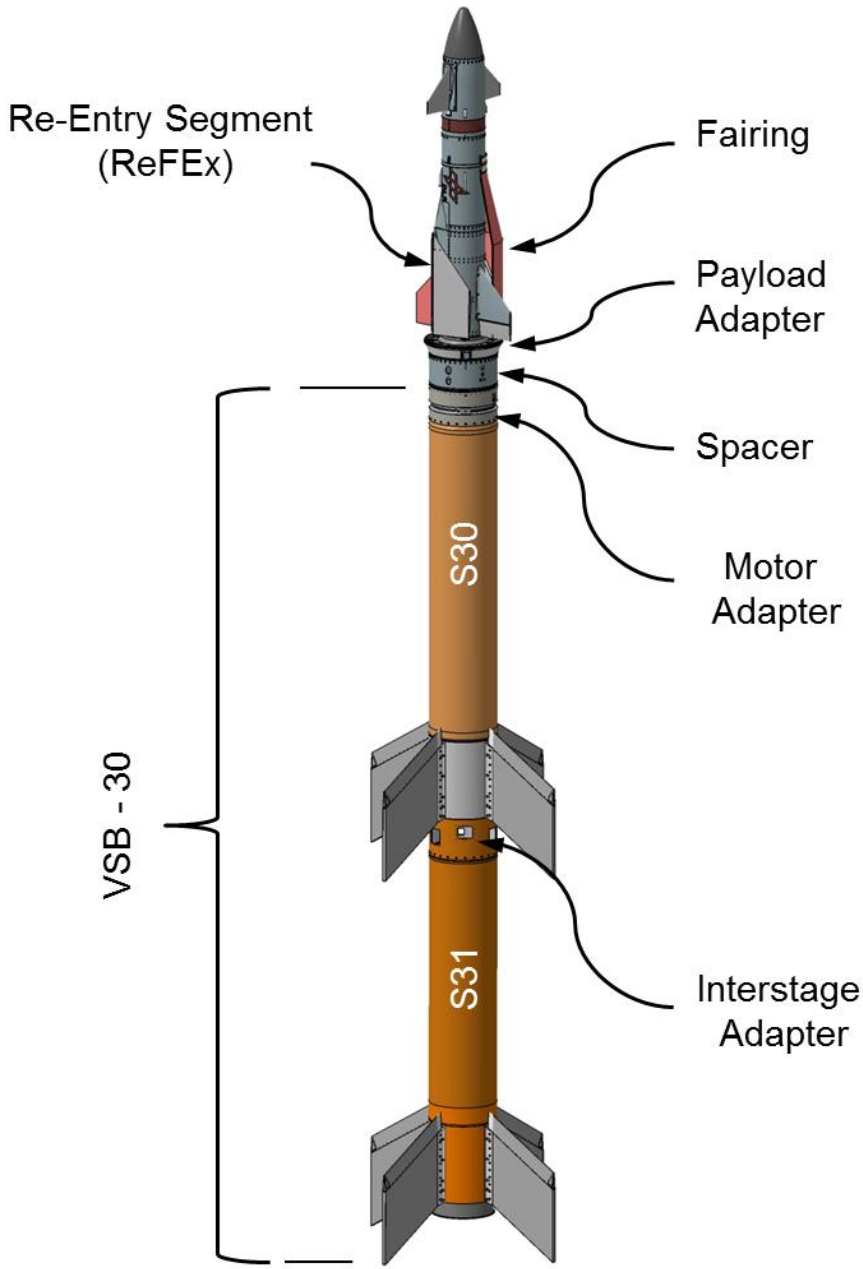
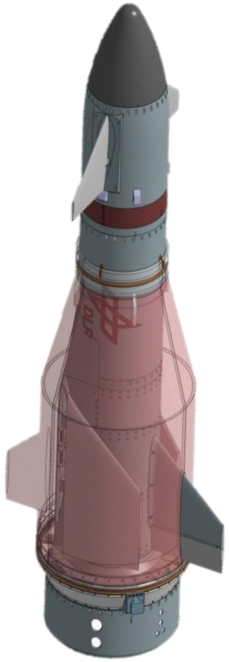
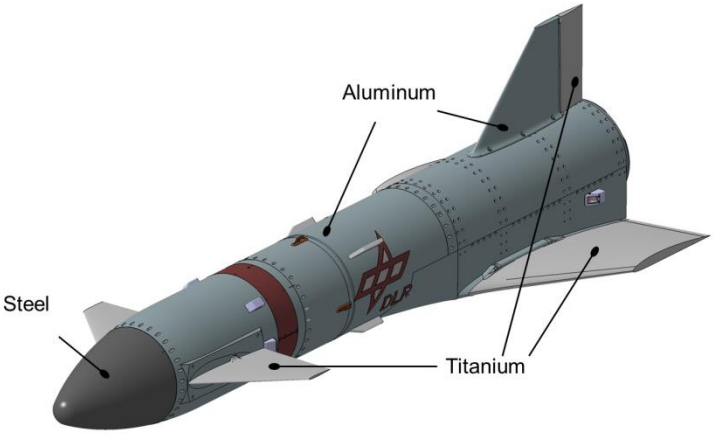
Launch & Re-Entry Configuration



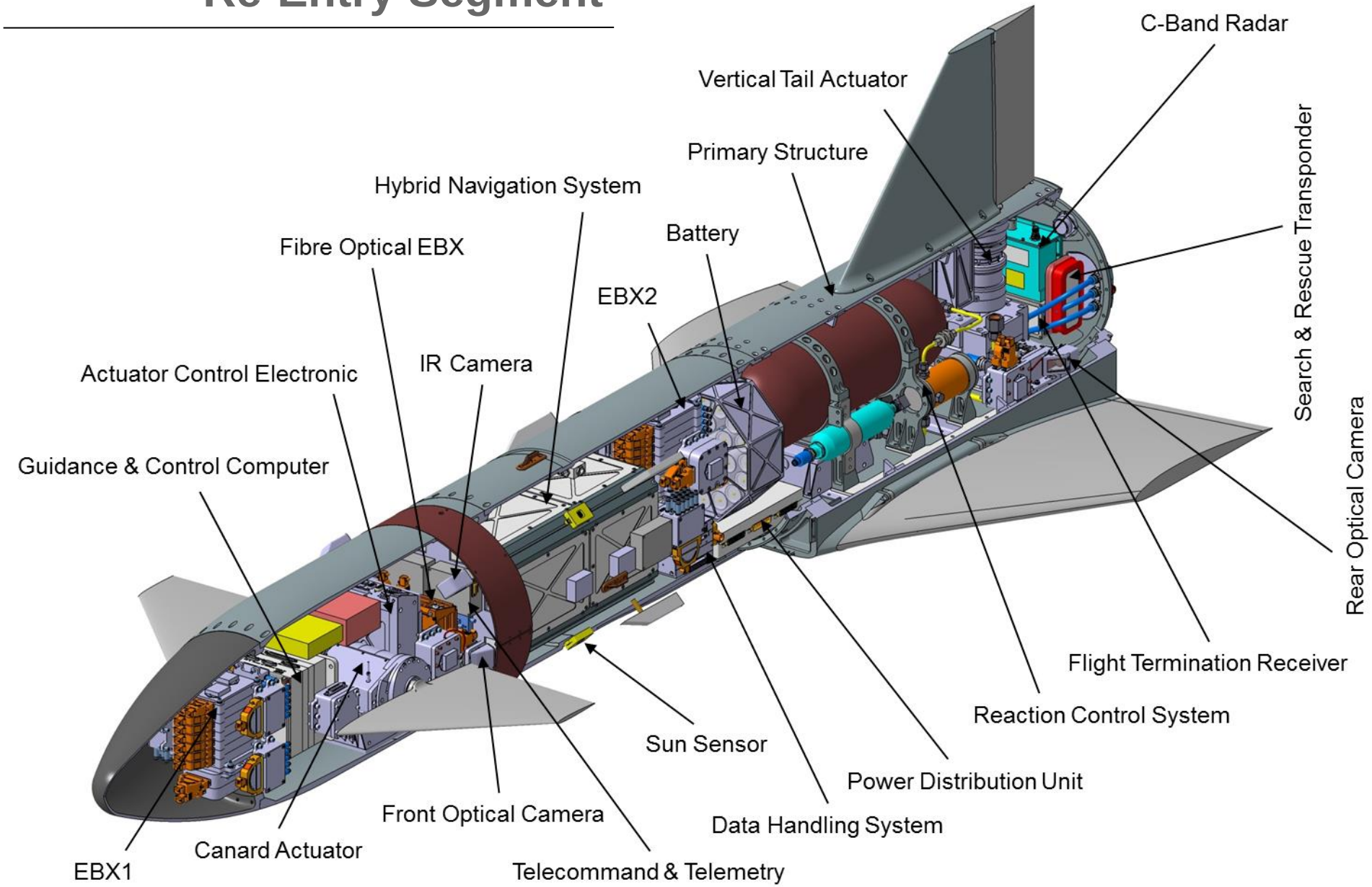


Payload Mass: ~ 500 kg



Re-Entry Segment Mass: ~ 400 kg

Re-Entry Segment



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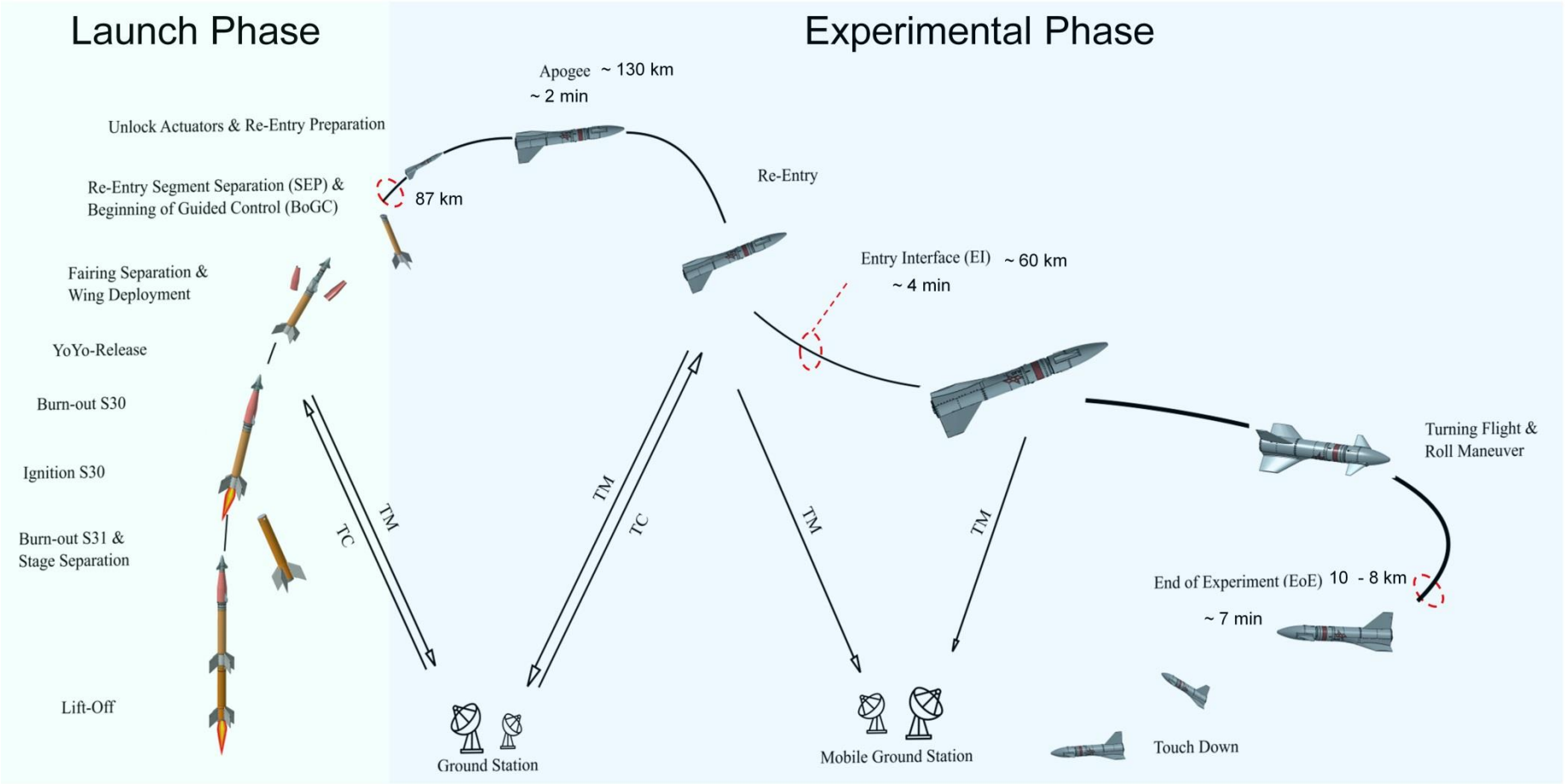
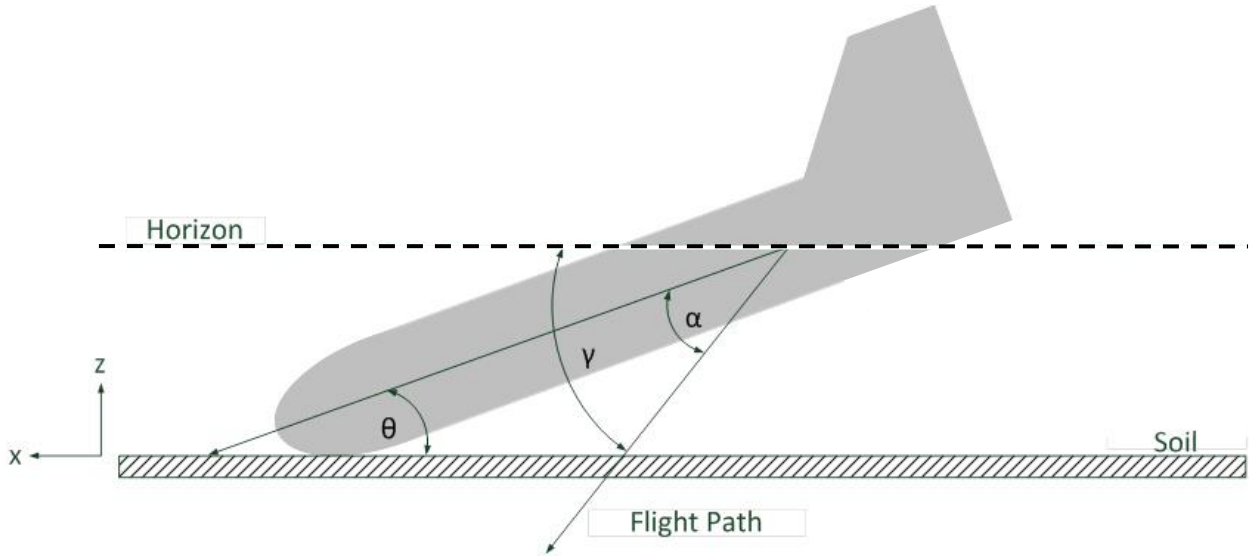
Mission Architecture & Flight Events



~ 1.6 min

~ 10 min

Crash Scenarios



α = angle of attack; γ = flight path angle; Θ = impact angle, v = velocity

Scenario	γ (°)	α (°)	θ (°)	$\lvert v_{ges} \rvert$ (m/s)	$\lvert v_x \rvert$ (m/s)	$\lvert v_z \rvert$ (m/s)	$\lvert v_y \rvert$ (m/s)
0	2	11	13	100	100	3.5	0
I	-15	10	-5	145	140	37.5	0
II	-27	0	-27	270	240	122.6	0
III	-90	0	-90	70	0	70	0

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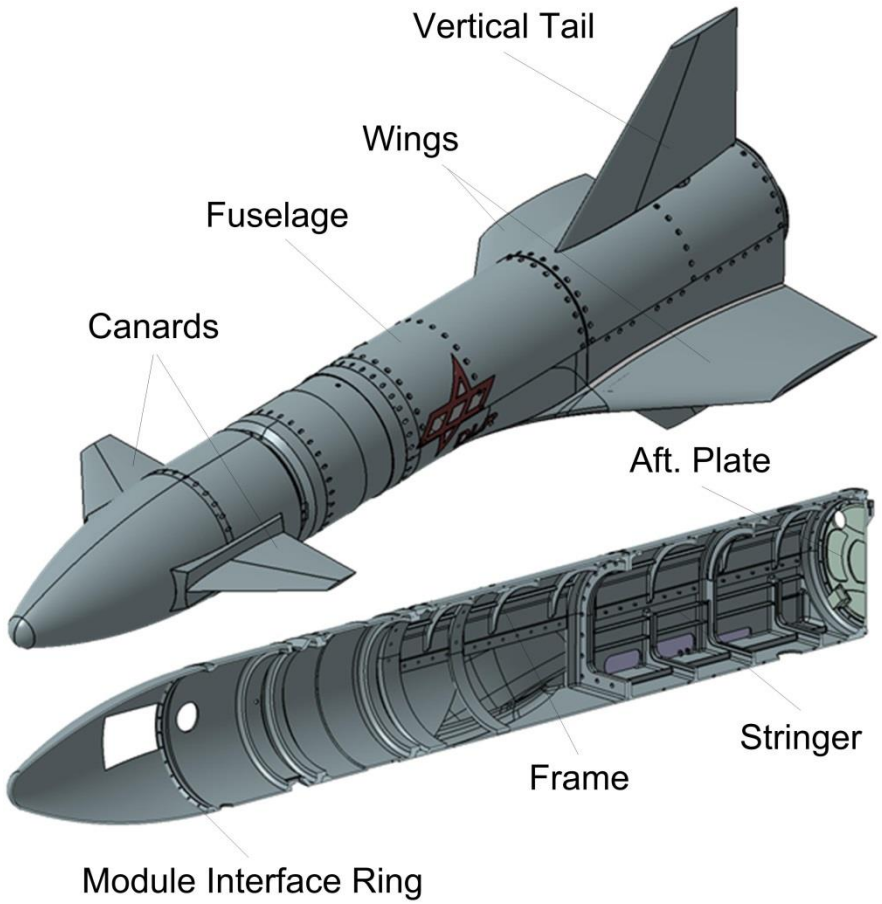
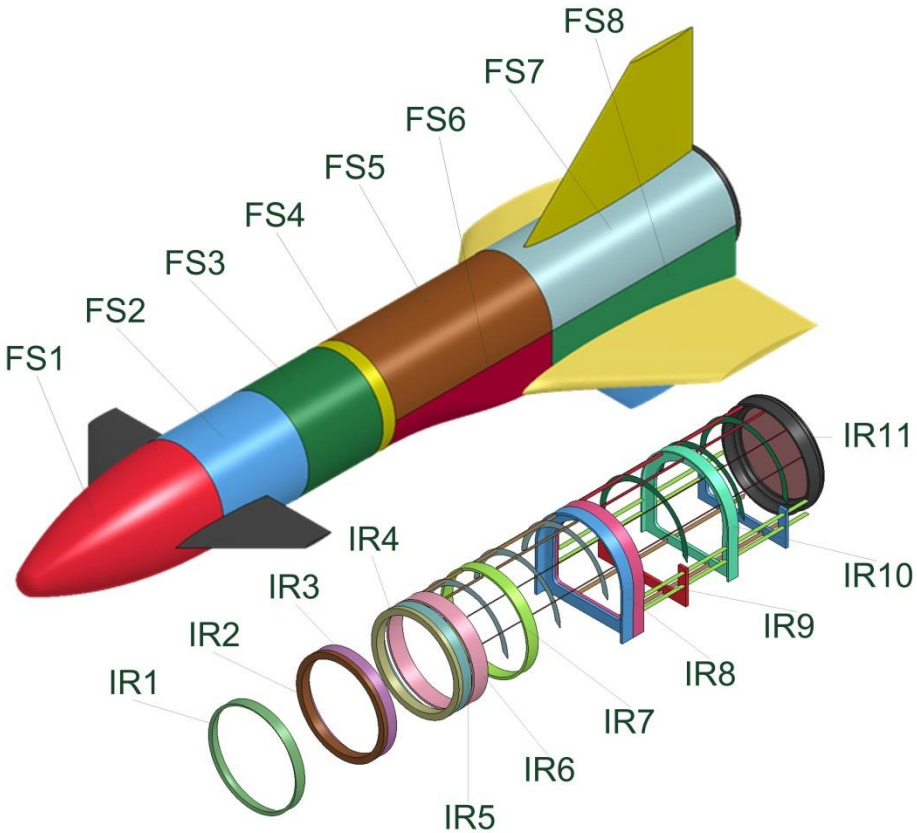
CAD and FEM Models

CAD

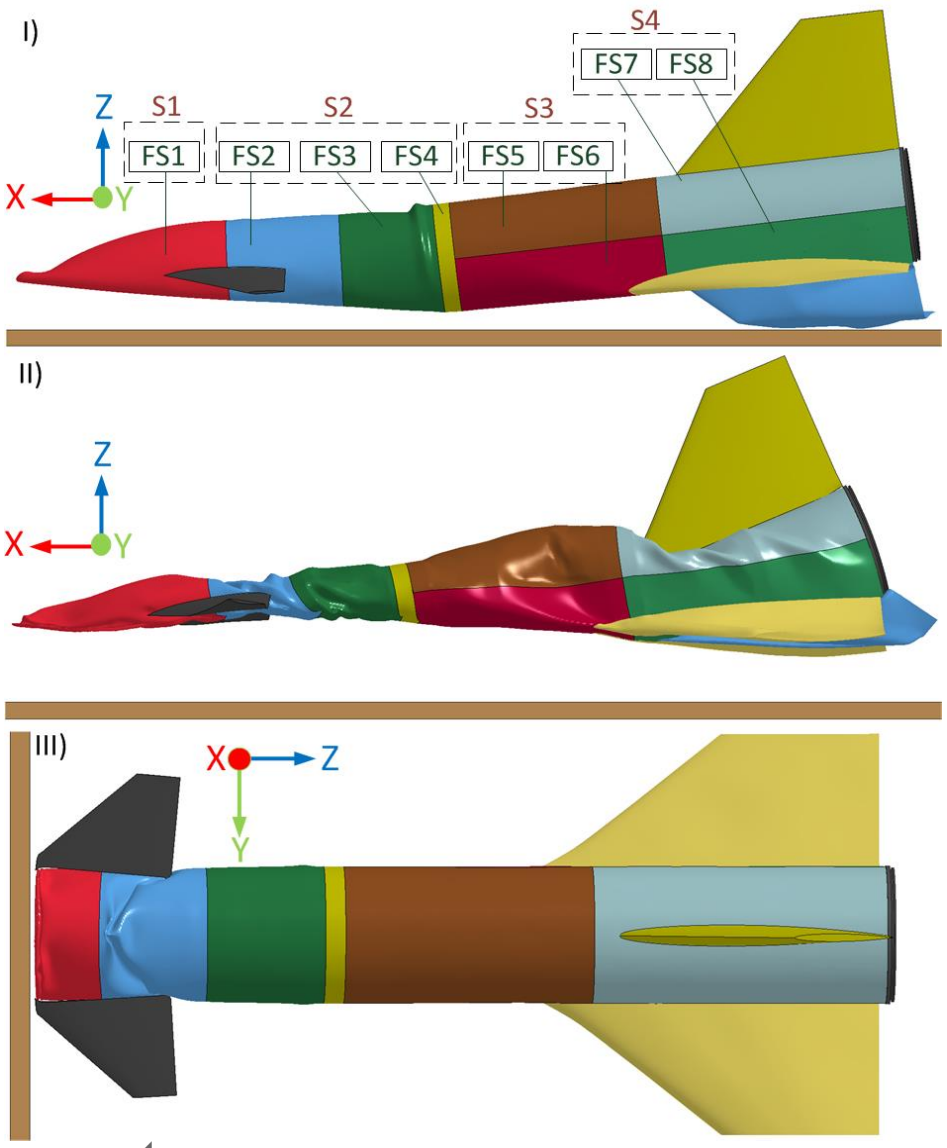


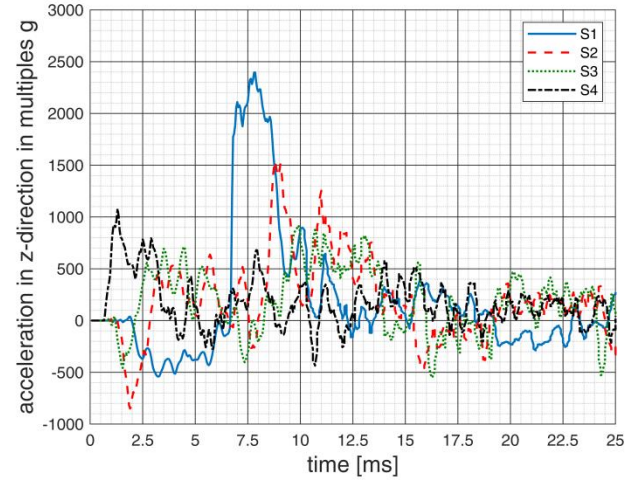
FEM



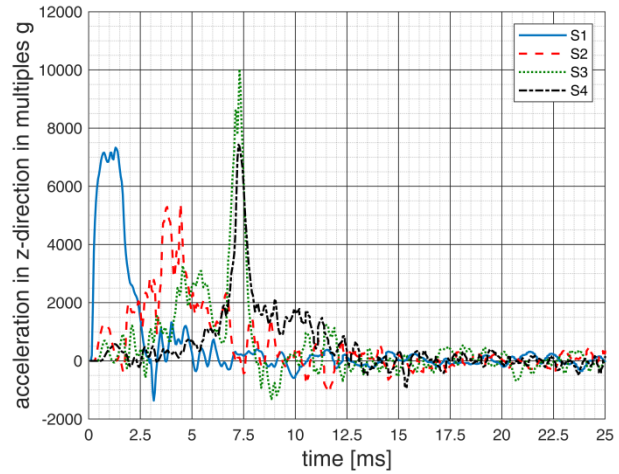
FS =Fuselage Section; IR = Interface Ring

Configuration 1; Scenarios I, II, III

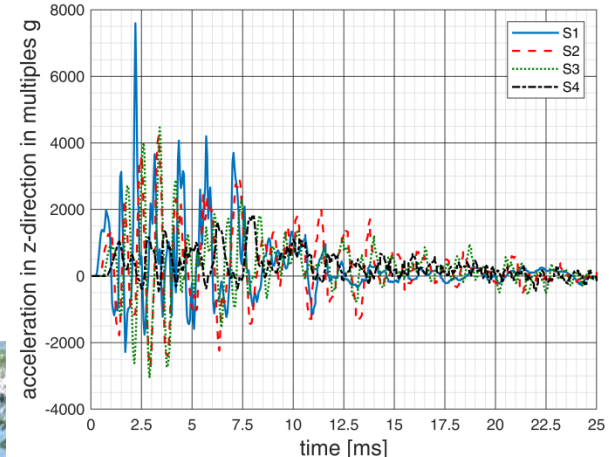




I



II



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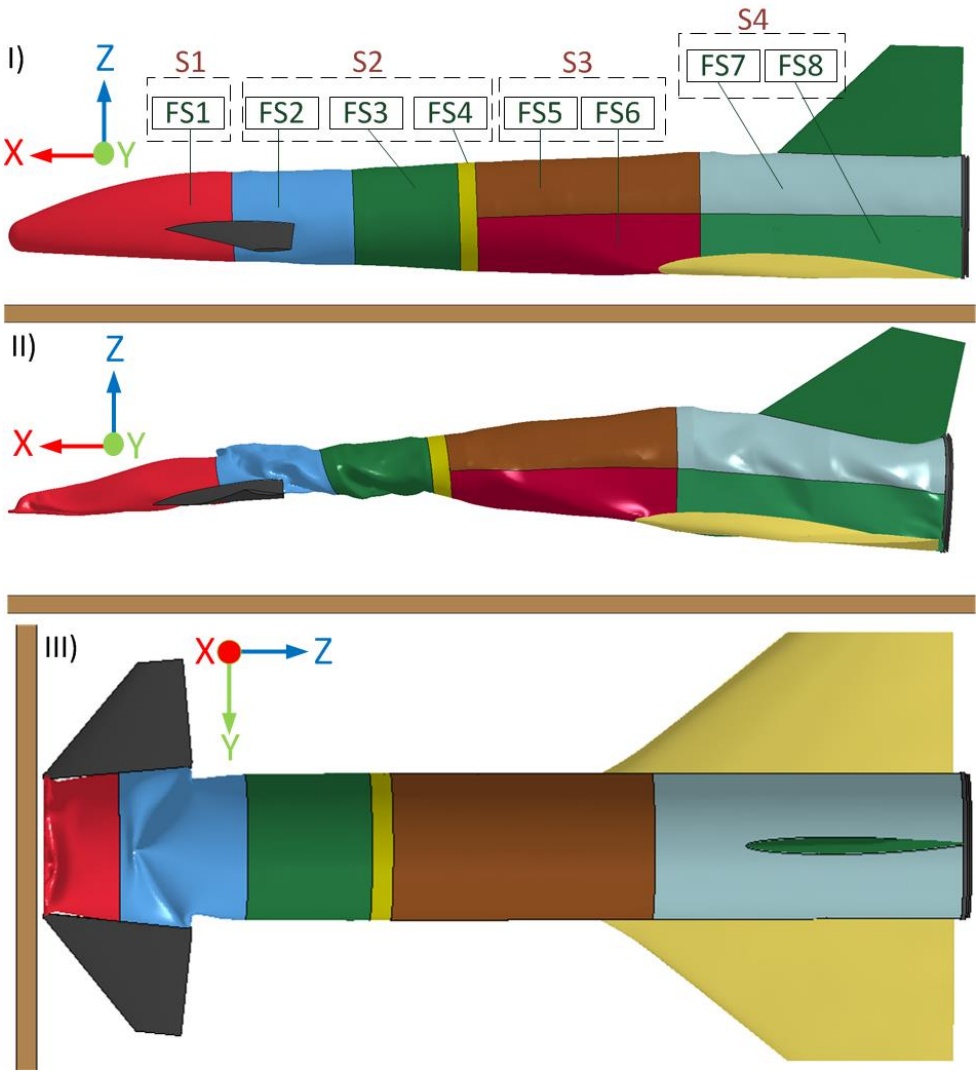
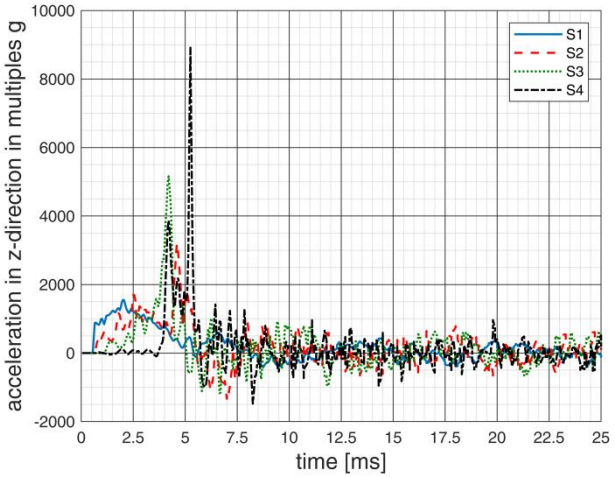
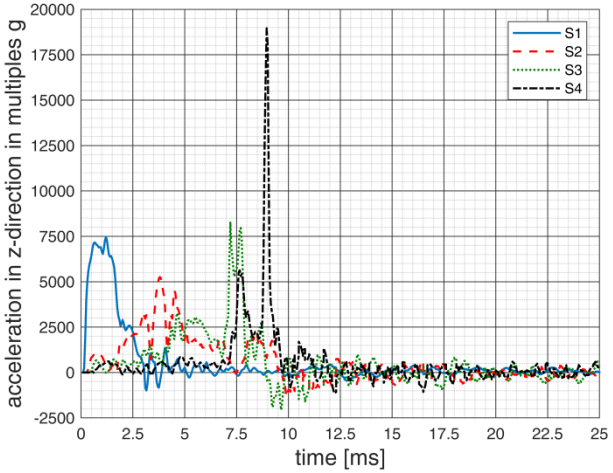
Configuration 2; Scenarios I, II, III

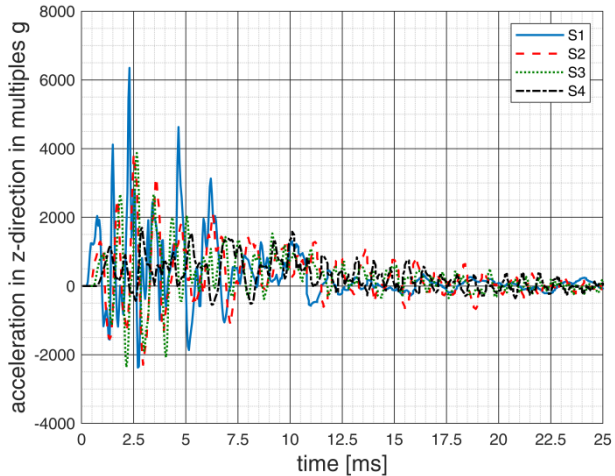




I



II



III

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Thank you for your Attention!

Questions?

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