

Supplementary Material

Table 1: Base meta model for conducting simulation experiments in finite element analysis. A geometric model, a physical model, and a solver need to be provided and configured. Optionally, observations and derived properties can be specified. The rows describe the different input properties of the meta model. Sub-properties are denoted by “•”. Alternative meta model parts are indicated by “→”.

	Name	Description	Type	Choices	Required
Geometric Model	studyName	Name of the simulation study	String	–	no
	dimensions	Number of dimensions	Integer, $> 0, \leq 3$	–	yes
	geometry	Choose geometry type	Alternative	–	yes
	→meshFile	Path to mesh file	String	–	yes
	→geometryFile	Path to geometry file	String	–	yes
	geometryValues	Define the geometry	Map	–	no
	•subDomain	Geometry element (key)	String	–	no
	•subDomainValue	Value of geometry element	Real	–	no
Physical Model	physics	Choose a physical model	String	EQS, ...	yes
	materialProperties	Define materials and their properties	Map	–	yes
	•materialName	Material used in the model (key)	String	–	yes
	•conductivityValue	Conductivity of the material	Real	–	yes
	•permittivityValue	Permittivity of the material	Real	–	yes
	boundaryCondition	Choose a boundary condition	Alternative	–	yes
	→dirichlet	Dirichlet boundary condition	Map	–	yes
	•boundary	Name of the boundary (key)	String	–	yes
	•boundaryValue	Boundary value	Real	–	yes
	→vonNeumann	Von Neumann boundary condition	Map	–	–
Simulation
	frequency	Frequency value	Real	–	yes
	solver	Choose a solver type	String	MUMPS, ...	yes
	element	Choose an element type	String	CG, ...	yes
	degree	Degree of the polynomial	Integer	–	yes
	meshRefinement	Use iterative mesh refinement	Map	–	no
	•refinedSubDomain	Name of the subdomain to be refined (key)	String	–	no
Observation	•refinementCycles	Number refinement steps	Integer	–	no
	observationPoints	Points at which equations are solved	Map	–	no
	•observationPosition	Coordinates of the observed point (key)	Array<Real>, length $\in \{1..3\}$	–	no
	•observationAlias	Alias for the observation	String	–	no
	outputFormat	Choose an output format	String	XMDF, ...	no
	observables	Calculation of derived properties	Map	–	no
	•derivedPropertyName	Name of the derived property (key)	String	–	no
	•derivedPropertyExpression	Expression for calculating the property	String	–	no