Investigation of Simulation Infrastructure

Study 2: Systematization and Learning of Results

SHARMAZANASHVILI Alexander
Georgian Technical University

TSUTSKIRIDZE Nikoloz
Georgian Technical University

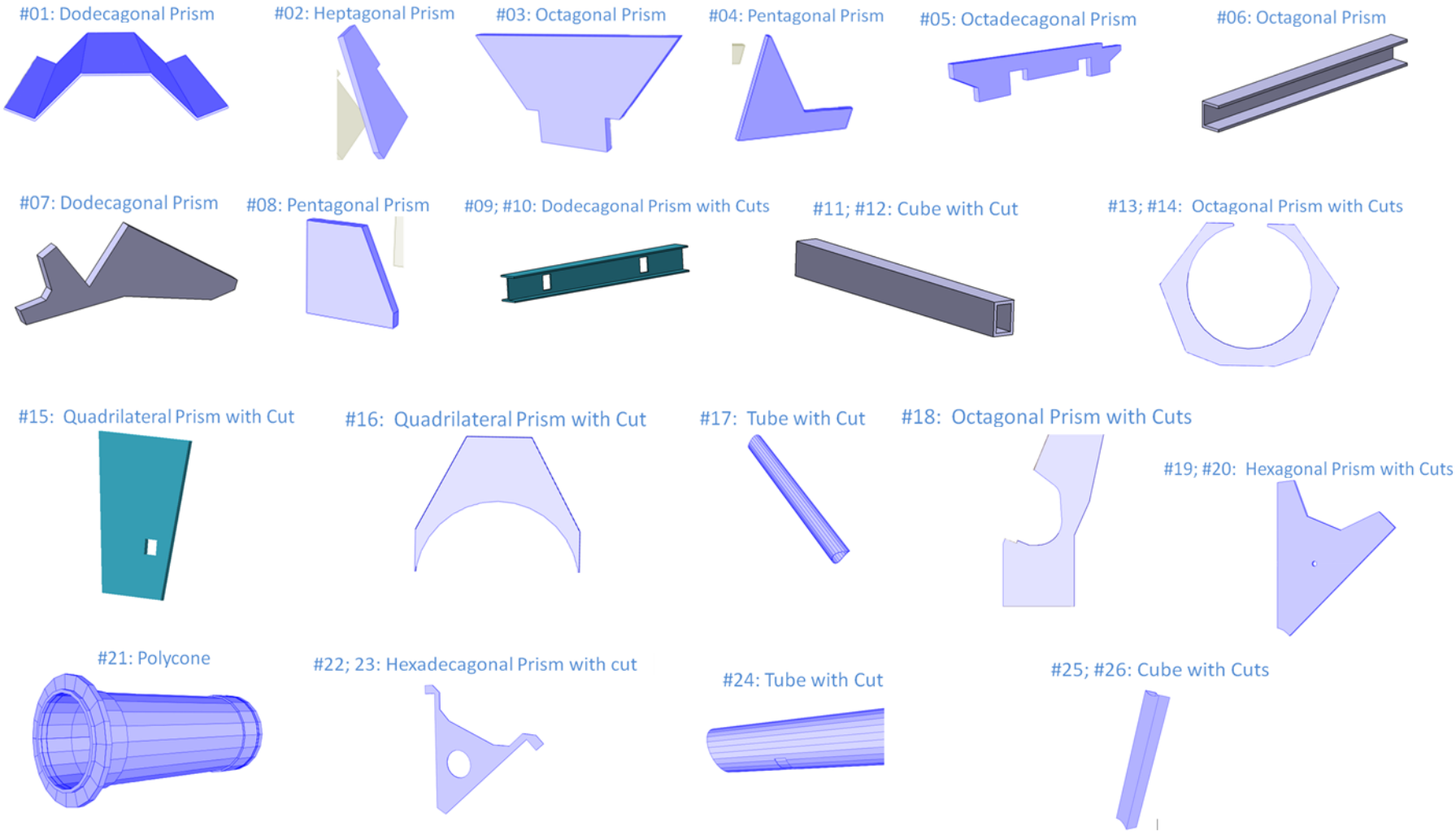
About Current WP's

Methodology of Analyses

1. Categorization of geometry of Detector components
2. Selection Methods for description
3. Test runs of test examples
4. Case study of transactions

I. Categorization of Geometry

84 typical representors of class of objects have been separated



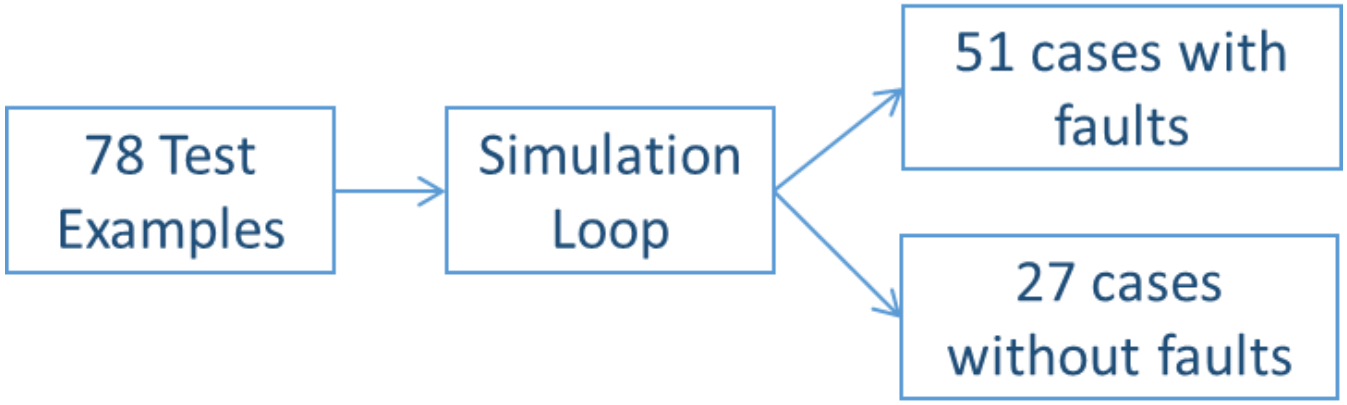
II. Selection of Methods for Description

Example: Descriptions of Octadecagonal Prism

I.	II.	III.
Arbitrary Move (Z) Rotation	Cube Arbitrary Subtraction Move rotation	Cube Pyramid Move Subtraction Cube Move Subtraction Cube Move Cube Move Cube Move Cube Pyramid Move Subtraction Union Move Rotation

Result: 78 unique Test examples have been formed

III. Test Runs of Examples



IV. Case Study of Transactions

		Geometric Primitives										Transactions					CATIA vs GeoModel (VP1)						CATIA vs Geant4					
							GeoModel																					
	Ex. №	Cube	Tube	Pyr	Trap.	Cone	PolyC.	PolyG.	Arbitr.	Sym.	Dsym	M	R	Subt.	M	R	M	R	Subtr.	M	R	Conf	M	R	Subt	M	R	Conf
1	1			3X								5X	4X	5X	X	X	0	0	ΔX=0.25 ΔY=-0.15 Δ_V=0.0014	ΔX=-0.02 ΔY=0.01	ΔX=0.07 ΔY=-0.18		0	0	ΔX=0.25 ΔY=-0.15 Δ_V=0.0014	ΔX=-0.02 ΔY=0.01	ΔX=0.06 ΔY=-0.17	
2	2	2X										2X	X	2X	X	X	0	0	ΔY=0.01 ΔZ=-0.02	0	ΔX=0.01		0	0	ΔY=0.01 ΔZ=-0.02	ΔZ=0.03	ΔX=-0.01 ΔY=-0.02	
3	4	X							X					X	X	X			ΔX=-0.03 ΔY=-0.02	0	ΔX=0.02 ΔY=-0.02 ΔZ=-0.02				ΔX=-0.03 ΔY=-0.02	0	ΔX=0.02 ΔY=-0.02	
4	6	2X										X		X	X	X	0		ΔX=-0.23 ΔZ=-0.13 ΔV=0.0002	0	ΔX=0.03 ΔY=0.1 ΔZ=0.01		0		ΔX=-0.23 ΔZ=-0.13 ΔV=0.0002	ΔZ=0.03	ΔX=0.03 ΔY=0.1 ΔZ=0.01	
5	7	X							X					2X	X	X			ΔX=-0.07 ΔY=-0.05	ΔX=0.01 ΔY=0.05	ΔX=-0.02 ΔY=0.09				ΔX=-0.07 ΔY=-0.05	ΔX=0.01 ΔY=0.05	ΔX=0.04 ΔY=0.09	
6	8	2X										X	X	X	X	X	0	0	ΔZ=-0.01	0	0		0	0	ΔZ=-0.01	0	0	
7	9								2X			2X		2X	X	X	0		0	0	ΔX=-0.01		0		0	0	0	
8	10	3X										4X		4X	X	X	0		ΔX=0.03 ΔY=0.03	ΔX=0.03 ΔY=0.03	ΔX=-0.04 ΔY=-0.02		0		ΔX=0.03 ΔY=0.03	ΔX=0.03 ΔY=0.03	ΔX=-0.04 ΔY=-0.02	
9	11	2X												X	X	X			ΔY=-0.09 ΔZ=-0.06	0	ΔX=0.03 ΔY=0.01				ΔY=-0.09 ΔZ=-0.06	ΔY=-0.01 ΔZ=-0.01	ΔX=0.03 ΔY=0.02	
10	12								2X					X	X	X			ΔX=-0.09 ΔY=-0.06	ΔY=-0.02	ΔX=0.03 ΔY=0.01				ΔX=-0.09 ΔY=-0.06	ΔY=-0.03	ΔX=0.03 ΔY=0.02	
11	13	X	X							X		X		2X	X	X	0		ΔX=0.01 Δ_V=0.0002	ΔX=-0.03 ΔY=-0.02	ΔX=-0.01 ΔY=0.02		0		ΔX=0.01 Δ_V=0.0002	ΔX=0.03 ΔY=-0.03	ΔX=-0.01 ΔY=0.03	
12	14	X	X						X			2X		2X	X	X	0		ΔX=-0.03 ΔY=-0.02 Δ_V=0.0002	0	ΔX=-0.01 ΔY=0.02		0		ΔX=-0.03 ΔY=-0.02 Δ_V=0.0002	0	ΔX=-0.01 ΔY=0.03	
13	15	X		X								X		X	X	X	0		0	0	ΔX=0.01		0		0	0	ΔX=0.01 ΔY=-0.01	
14	16		X						X			X		X	X	X	0		ΔX=-0.03 ΔY=-0.02	0	ΔX=-0.01 ΔY=0.02		0		ΔX=-0.04 ΔY=-0.03	0	ΔX=-0.01 R=0.01	
15	17		2X									2X	2X	2X	X	X	0	0	ΔX=0.04 ΔY=0.02 ΔV=0.002	ΔX=0.01	ΔX=0.02 ΔY=0.03 R=0.01		0	0	ΔX=0.04 R=0.02 ΔV=0.002	ΔX=0.01 ΔY=0.01 ΔZ=0.01	ΔX=0.02 ΔY=0.03 R=0.05	
16	18		2X						X	X		2X		3X	X		0		ΔX=-0.11 ΔY=0.19 Δ_V=0.0003	0			0		ΔX=-0.11 ΔY=0.19 R=0.01 Δ_V=0.0003	ΔX=-0.07 ΔY=-0.04 R=0.08		

IV. Case Study of Transactions

		Geometric Primitives										Transactions					CATIA vs GeoModel (VP1)						CATIA vs Geant4					
							GeoModel																					
	Ex. №	Cube	Tube	Pyr	Trap.	Cone	PolyC.	PolyG.	Arbitr.	Sym.	Dsym	M	R	Subt.	M	R	M	R	Subtr.	M	R	Conf	M	R	Subt	M	R	Conf
17	19		2X						X			2X		2X	X	X	0		ΔX=0.06 ΔY=0.04 ΔV=0.0003	0	ΔY=-0.03		0		ΔX=0.06 ΔY=0.01 R=0.03 ΔV=0.0003	ΔX=-0.03 ΔY=-0.04 R=0.05	ΔX=0.04 ΔY=0.06 R=0.09	
18	20		2X	X						X		3X	X	3X	X	X	0	0	ΔX=-0.14 ΔY=-0.08 Δ_V=0.0003	ΔX=0.01 ΔY=0.01	ΔX=-0.03 ΔY=0.06		0	0	ΔX=-0.14 ΔY=-0.08 R=0.03 Δ_V=0.0003	ΔX=0.01 ΔY=-0.04 R=0.03	ΔX=-0.03 ΔY=0.06 R=0.01	
19	22		X						X			X		X	X	X	0		ΔX=-0.03 ΔY=-0.02 Δ_V=0.0001	0	ΔY=0.02		0		ΔX=-0.03 ΔY=-0.02 Δ_V=0.0001	0	ΔY=0.02	
20	23		X	X					2X			X	2X	4X	X	X	0	0	ΔX=0.23 ΔY=-0.09 Δ_V=0.0001	0	ΔX=-0.03 ΔY=-0.09		0	0	ΔX=0.23 ΔY=-0.09 Δ_V=0.0001	0	ΔX=-0.03 ΔY=-0.09	
21	24	X	X									X		X	X	X	0		ΔX=-0.02 ΔY=0.01 ΔZ=-0.01	ΔX=-0.01 ΔY=-0.01 ΔZ=-0.01	ΔX=0.02 ΔY=0.01		0		ΔX=-0.02 ΔY=0.01 ΔZ=-0.01	ΔX=-0.02	ΔX=0.01 ΔY=0.02	
22	25		X						2X			2X		3X	X	X	0		ΔX=0.03 ΔY=0.02 Δ_V=0.0005 R=0.01	0	ΔY=-0.02		0		ΔX=0.03 ΔY=0.21 Δ_V=0.0001 R=0.17	0	ΔY=0.23 R=0.05	
23	26	2X	X									2X		3X	X	X	0		ΔX=0.03 ΔY=0.02	ΔY=-0.02 R=0.01	ΔX=0.02		0		ΔX=0.03 ΔY=0.2 R=0.02	ΔY=-0.01 R=0.02	ΔX=0.07 ΔY=-0.03 R=0.05	
24	27								4X			3X	2X	4X	X	X	0	0	ΔX=0.15 ΔY=-0.22 ΔZ=-0.06	ΔX=0.01 ΔZ=-0.02	ΔX=-0.09 ΔY=0.07		0	0	ΔX=0.15 ΔY=-0.16 ΔZ=0.08	ΔX=0.26 ΔY=0.03 ΔZ=-0.02	ΔX=-0.07 ΔY=-0.04	
25	28	2X									2X	3X	2X	4X	X	X	0	0	ΔX=0.15 ΔY=-0.22 ΔZ=-0.06	ΔX=0.01 ΔZ=-0.02	ΔX=-0.09 ΔY=0.07		0	0	ΔX=0.15 ΔY=-0.16 ΔZ=0.08	ΔX=0.26 ΔY=0.03 ΔZ=-0.02	ΔX=-0.07 ΔY=-0.04	
26	29		X						2X			X	2X	3X	X	X	0	0	ΔX=0.01 ΔY=-0.03 ΔZ=0.01 Δ_V=0.0002	ΔY=-0.01 ΔZ=0.01	ΔX=-0.01 ΔY=0.01 ΔZ=0.01		0	0	ΔX=0.01 ΔY=-0.03 ΔZ=0.01 Δ_V=0.0002	ΔY=0.01 ΔZ=0.03	ΔX=0.01 ΔY=0.03 ΔZ=-0.01	
27	30		X						2X			8X	7X	8X	X	X	0	0	ΔX=0.03 ΔY=-0.03 ΔZ=-0.02 Δ_V=0.0003	ΔY=-0.03 ΔZ=0.03	ΔY=0.01 ΔZ=0.04		0	0	ΔX=0.03 ΔY=-0.03 ΔZ=0.03 Δ_V=0.0003	ΔY=0.03 ΔZ=-0.03 R=0.01	ΔX=0.01 ΔY=-0.03 ΔZ=0.02 R=0.01	

IV. Case Study of Transactions

	Ex. №	Geometric Primitives: Cube	Tube	Pyr	Trap.	Cone	GeoModel: PolyC.	PolyG.	Arbitr.	Sym.	Dsym	Transactions: M	R	Subt.	M	R	CATIA vs GeoModel (VP1): M	R	Subtr.	M	R	Conf	CATIA vs Geant4: M	R	Subt	M	R	Conf
28	31		X							X	X	8X	8X	8X	X	X	0	0	ΔX=0.03 ΔY=-0.03 ΔZ=-0.03 Δ_V=0.00031	ΔY=-0.03 ΔZ=0.03	ΔY=0.01 ΔZ=0.04		0	0	ΔX=0.03 ΔY=-0.03 ΔZ=-0.03 Δ_V=0.00031	ΔX=0.02 ΔY=0.03 R=0.01	ΔX=-0.02 ΔY=-0.03 ΔZ=0.03 R=0.01	
29	32					X			3X			7X	5X	7X	X	X	0	0	ΔX=0.03 ΔY=0.03 ΔZ=0.03 Δ_V=0.0016	ΔX=-0.03 ΔZ=-0.02 Δ_V=0.0033	ΔX=0.01 ΔZ=0.02		0	0	ΔX=-0.05 ΔY=0.03 ΔZ=-0.03 Δ_V=0.0016 R=0.01	ΔX=0.04 ΔY=0.06 ΔZ=-0.05 Δ_V=0.0033 R=0.02	ΔX=0.05 ΔY=-0.08 ΔZ=-0.02 R=0.04	
30	33					X			2X	X		7X	5X	7X	X	X	0	0	ΔX=0.03 ΔY=0.03 ΔZ=0.03 Δ_V=0.0016	ΔX=-0.03 ΔZ=-0.02 Δ_V=0.0033	ΔX=0.01 ΔZ=0.02		0	0	ΔX=-0.05 ΔY=0.03 ΔZ=-0.03 Δ_V=0.0016 R=0.01	ΔX=0.04 ΔY=0.06 ΔZ=-0.05 Δ_V=0.0033 R=0.02	ΔX=0.05 ΔY=-0.08 ΔZ=-0.02 R=0.04	
31	34		X						X			2X	2X	2X	X	X	0	0	Δ_V=0.0001	0	0		0	0	ΔY=0.01 Δ_V=0.0001	0	0	
32	35		X							X		2X	2X	2X	X	X	0	0	Δ_V=0.0001	0	0		0	0	ΔY=0.01 Δ_V=0.0001	0	0	
33	36		X						X			2X		2X	X	X	0		ΔX=0.02 Δ_V=0.00001	0	ΔX=-0.01 ΔZ=-0.01		0		ΔX=0.02 ΔZ=0.01 Δ_V=0.00007	ΔX=0.02 ΔZ=-0.02 R=0.03	ΔX=-0.17 ΔZ=0.17 R=0.25	
34	37	2X	2X									3X		3X	X	X	0		ΔX=0.01 ΔZ=0.01 Δ_V=0.00007	0	ΔZ=0.02		0		ΔX=0.02 ΔZ=0.01	ΔX=-0.03 ΔZ=0.05 R=0.05	ΔX=-0.16 ΔZ=-0.21 R=0.19	
35	38		2X						X			X		2X	X		0		ΔX=-0.03 ΔY=-0.03 ΔV=0.0009	0			0		ΔX=-0.03 ΔY=-0.03 ΔV=0.0009	0		
36	39	X	2X						X	X		2X		4X	X		0		ΔX=-0.24 ΔY=-0.18 ΔV=0.0009	0			0		ΔX=-0.24 ΔY=-0.18 ΔV=0.0009	0		
37	40								5X				2X	4X	X	X		0	ΔX=0.11 ΔY=0.09 ΔZ=-0.12 Δ_V=0.0004	ΔX=0.01 ΔY=-0.01 ΔZ=0.01	ΔX=0.09 ΔY=0.1			0	ΔX=0.11 ΔY=0.09 ΔZ=-0.12 Δ_V=0.0004	ΔX=0.01 ΔY=0.01 ΔZ=0.01	ΔX=0.09 ΔY=0.1	
38	41	X							4X				3X	4X	X	X		0	ΔX=0.11 ΔY=0.09 ΔZ=-0.12 Δ_V=0.0004	ΔY=0.01	ΔX=0.09 ΔY=0.1			0	ΔX=0.11 ΔY=0.09 ΔZ=-0.12 Δ_V=0.0004	ΔY=0.01	ΔX=0.09 ΔY=0.1	

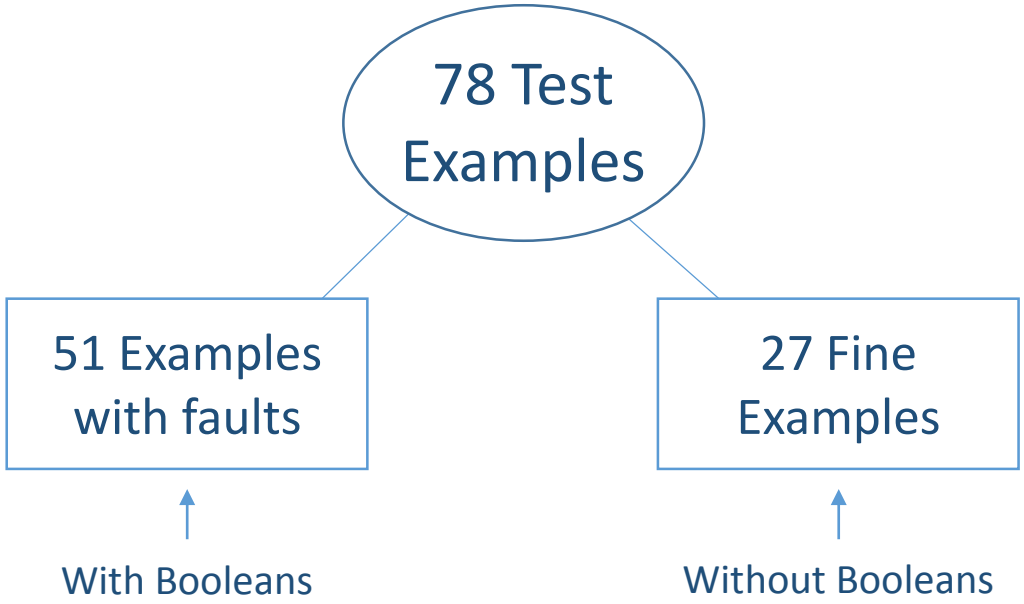
IV. Case Study of Transactions

		Geometric Primitives										Transactions					CATIA vs GeoModel (VP1)						CATIA vs Geant4					
							GeoModel																					
	Ex. №	Cube	Tube	Pyr	Trap.	Cone	PolyC.	PolyG.	Arbitr.	Sym.	Dsym	M	R	Subt.	M	R	M	R	Subtr.	M	R	Conf	M	R	Subt	M	R	Conf
39	55	X			X							2X	2X	2X	X	X	0	0	ΔX=0.08 ΔY=0.01	ΔY=0.02	ΔX=-0.01 ΔY=0.02	-	0	0	ΔX=0.08 ΔY=0.01	ΔY=0.02	ΔX=-0.01 ΔY=0.01	-
40	56	2X										3X		3X	X	X	0		ΔX=0.03 ΔY=0.02	0	ΔX=0.01	-	0		ΔX=0.03 ΔY=0.02	0	0	-
41	57		2X									2X	2X	X	X	X	0	0	ΔX=0.04 ΔY=0.02 ΔV=0.002	ΔX=0.01	ΔX=0.02 ΔY=0.03 R=0.01		0	0	ΔX=0.04 R=0.02 ΔV=0.002	ΔX=0.01 ΔY=0.01 ΔZ=0.01	ΔX=0.02 ΔY=0.03 R=0.05	-
42	58	2X	X									X		2X	2X	X	0		ΔX=0.03 ΔY=0.02	ΔY=-0.02 R=0.01	ΔX=0.02		0		ΔX=0.03 ΔY=0.2 R=0.02	ΔY=-0.01 R=0.02	ΔX=0.07 ΔY=-0.03 R=0.05	-
43	59	2X	X									X		2X	2X	X	0		ΔX=0.03 ΔY=0.02 Δ_V=0.0005 R=0.01	0	ΔY=-0.02		0		ΔX=0.03 ΔY=0.21 Δ_V=0.0001 R=0.17	0	ΔY=0.23 R=0.05	-
44	60	X									2X	X	X	2X	2X	2X	0	0	ΔX=0.15 ΔY=-0.22 ΔZ=-0.06	ΔX=0.01 ΔZ=-0.02	ΔX=-0.09 ΔY=0.07		0	0	ΔX=0.15 ΔY=-0.16 ΔZ=0.08	ΔX=0.26 ΔY=0.03 ΔZ=-0.02	ΔX=-0.07 ΔY=-0.04	-
45	61								3X			X	X	2X	2X	2X	0	0	ΔX=0.15 ΔY=-0.22 ΔZ=-0.06	ΔX=0.01 ΔZ=-0.02	ΔX=-0.09 ΔY=0.07		0	0	ΔX=0.15 ΔY=-0.16 ΔZ=0.08	ΔX=0.26 ΔY=0.03 ΔZ=-0.02	ΔX=-0.07 ΔY=-0.04	-
46	63	2X												X	X	X	0		ΔY=-0.09 ΔZ=0.06	ΔZ=0.01	ΔX=0.03 ΔY=0.01	-	0		ΔY=-0.09 ΔZ=0.06	ΔY=-0.01 ΔZ=0.01	ΔX=0.03 ΔY=0.02	-
47	69	X	X									X		X	X		0		ΔX=-0.06 ΔY=-0.05	0		-	0		ΔX=-0.06 ΔY=-0.05	0		-
48	72	X			X							3X	3X	2X	X	X	0	0	ΔX=0.08 ΔY=0.01	ΔY=0.02	ΔX=-0.01 ΔY=0.02	0	0	0	ΔX=0.08 ΔY=0.01	ΔY=0.02	ΔX=-0.01 ΔY=0.01	0
49	74	4X			2X							6X	6X	5X	2X	2X	0	0	ΔX=0.08 ΔY=0.01	ΔY=0.02	ΔX=-0.01 ΔY=0.02	-	0	0	ΔX=0.08 ΔY=0.01	ΔY=0.02	ΔX=-0.01 ΔY=0.01	-
50	75	2X	X									2X		X		X	0		ΔX=-1.34 ΔZ=0.94 Δ_V=0.175		ΔX=-0.47 ΔZ=0.33	Clash= 1.28	0		ΔX=-1.44 ΔZ=-0.9 Δ_V=0.044		ΔZ=-0.09	Clash= 0.91
51	77	X	2X									X	X	X	X	X	0		ΔX=-1.71 ΔZ=-1.25 Δ_V=34.45	0	0	-	0	0	ΔX=-1.75 ΔZ=-1.25 R=0.05 ΔV=34.45	0		-

V. Systematization and Learning of Results

Conclusion #01

- For all type of detector geometries dimensional, form and positioning faults are caused by *Boolean* operations

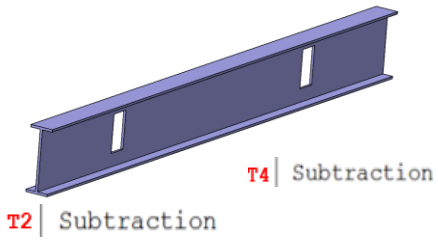


V. Systematization and Learning of Results

Conclusion #02

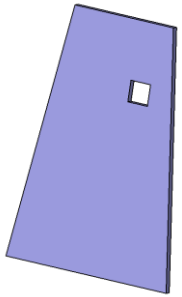
- All internal surfaces received by *Boolean* subtraction of parametrical primitives from Box brings 0 faults

- Test Example #09



	Arbitrary
	Arbitrary
T1	Move
T2	Subtraction
T3	Move
T4	Subtraction
T5	Move (Z)
T6	Rotation

- Test Example #15



	Pyramid
	Cube
T1	Move
T2	Subtraction
T3	Move
T4	Rotation

V. Systematization and Learning of Results

Conclusion #03

- *Boolean* operations are correlate with *Move* and *Rotate* transactions executing after the *Boolean*. All *Move*/*Rotate* transactions before *Boolean* are fine

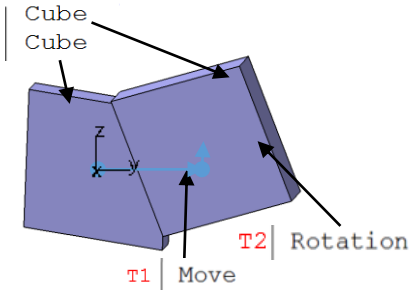
		Geometric Primitives										Transactions					CATIA vs GeoModel (VP1)						CATIA vs Geant4					
							GeoModel																					
	Ex. №	Cube	Tube	Pyr	Trap.	Cone	PolyC.	PolyG.	Arbitr.	Sym.	Dsym	M	R	Subt.	M	R	M	R	Subtr.	M	R	Conf	M	R	Subt	M	R	Conf
1	1			3X								5X	4X	5X	X	X	0	0	ΔX=0.25 ΔY=-0.15 Δ_V=0.0014	ΔX=-0.02 ΔY=0.01	ΔX=0.07 ΔY=-0.18		0	0	ΔX=0.25 ΔY=-0.15 Δ_V=0.0014	ΔX=-0.02 ΔY=0.01	ΔX=0.06 ΔY=-0.17	
2	2	2X										2X	X	2X	X	X	0	0	ΔY=0.01 ΔZ=-0.02	0	ΔX=0.01		0	0	ΔY=0.01 ΔZ=-0.02	ΔZ=0.03	ΔX=-0.01 ΔY=-0.02	
3	4	X							X					X	X	X			ΔX=-0.03 ΔY=-0.02	0	ΔX=0.02 ΔY=-0.02 ΔZ=-0.02				ΔX=-0.03 ΔY=-0.02	0	ΔX=0.02 ΔY=-0.02	
4	6	2X										X		X	X	X	0		ΔX=-0.23 ΔZ=-0.13 ΔV=0.0002	0	ΔX=0.03 ΔY=0.1 ΔZ=0.01		0		ΔX=-0.23 ΔZ=-0.13 ΔV=0.0002	ΔZ=0.03	ΔX=0.03 ΔY=0.1 ΔZ=0.01	
5	7	X							X					2X	X	X			ΔX=-0.07 ΔY=-0.05	ΔX=0.01 ΔY=0.05	ΔX=-0.02 ΔY=0.09				ΔX=-0.07 ΔY=-0.05	ΔX=0.01 ΔY=0.05	ΔX=0.04 ΔY=0.09	
6	8	2X										X	X	X	X	X	0	0	ΔZ=-0.01	0	0		0	0	ΔZ=-0.01	0	0	
7	9								2X			2X		2X	X	X	0		0	0	ΔX=-0.01		0		0	0	0	
8	10	3X										4X		4X	X	X	0		ΔX=0.03 ΔY=0.03	ΔX=0.03 ΔY=0.03	ΔX=-0.04 ΔY=-0.02		0		ΔX=0.03 ΔY=0.03	ΔX=0.03 ΔY=0.03	ΔX=-0.04 ΔY=-0.02	
9	11	2X												X	X	X			ΔY=-0.09 ΔZ=-0.06	0	ΔX=0.03 ΔY=0.01				ΔY=-0.09 ΔZ=-0.06	ΔY=-0.01 ΔZ=-0.01	ΔX=0.03 ΔY=0.02	
10	12								2X					X	X	X			ΔX=-0.09 ΔY=-0.06	ΔY=-0.02	ΔX=0.03 ΔY=0.01				ΔX=-0.09 ΔY=-0.06	ΔY=-0.03	ΔX=0.03 ΔY=0.02	
11	13	X	X							X		X		2X	X	X	0		ΔX=0.01 Δ_V=0.0002	ΔX=-0.03 ΔY=-0.02	ΔX=-0.01 ΔY=0.02		0		ΔX=0.01 Δ_V=0.0002	ΔX=0.03 ΔY=-0.03	ΔX=-0.01 ΔY=0.03	
12	14	X	X						X			2X		2X	X	X	0		ΔX=-0.03 ΔY=-0.02 Δ_V=0.0002	0	ΔX=-0.01 ΔY=0.02		0		ΔX=-0.03 ΔY=-0.02 Δ_V=0.0002	0	ΔX=-0.01 ΔY=0.03	

V. Systematization and Learning of Results

Conclusion #04

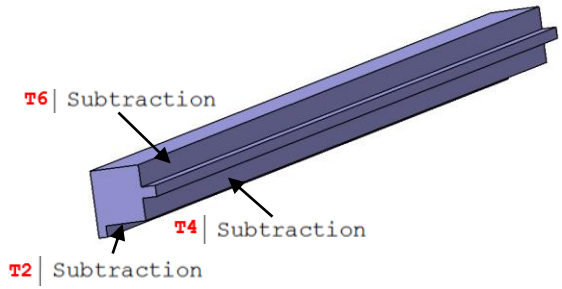
- For all external surfaces created by subtraction of parametrical primitives from Box, *Boolean* operation don't correlated with *Move*/*Rotation* transactions

- Test Example #08



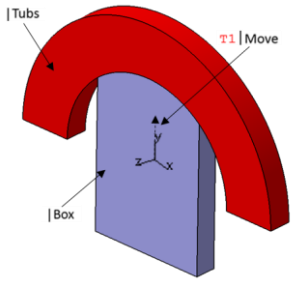
	Cube
	Cube
T1	Move
T2	Rotation
T3	Subtraction
T4	Move
T5	Rotation

- Test Example #56



	Box
	Box
T1	Move
T2	Subtraction
T3	Move
T4	Subtraction
T5	Move
T6	Subtraction
T7	Move
T8	Rotation

- Test Example #77



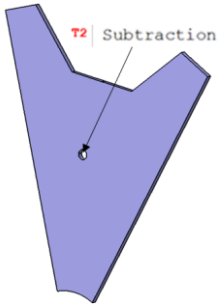
	Box
	Tubs
T1	Move
T2	Subtraction
T3	Move
T4	Rotation
	Tubs
T5	Rotation

V. Systematization and Learning of Results

Conclusion #05

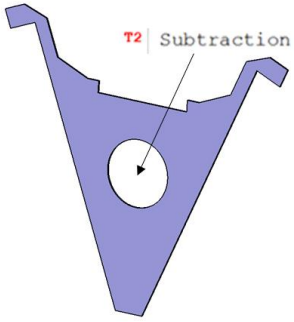
- For some internal surfaces created by subtraction of parametrical primitives from Polygon methods, *Boolean* operation don't correlated with *Move* transactions

- Test Example #19, #20



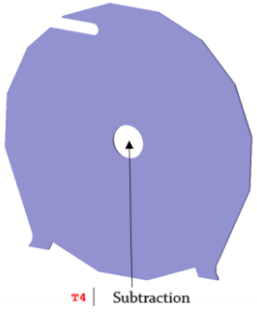
	Arbitrary
	Tube
T1	Move
T2	Subtraction
	Tube
T3	Move
T4	Subtraction
T5	Rotation
T6	Move

- Test Example #22



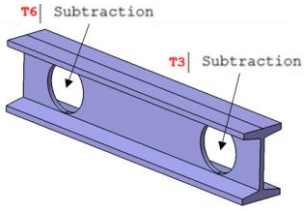
	Arbitrary
	Tube
T1	Move
T2	Subtraction
T3	Move (Z)
T4	Rotation

- Test Example #38, #39



	Symmetric
	Arbitrary
T1	Subtraction
	Cube
T2	Move
T3	Subtraction
	Tube
T4	Subtraction
	Tube
T5	Move
T6	Subtraction
T7	Move

- Test Example #34, #35



	Arbitrary
	Tube
T1	Rotation
T2	Move
T3	Subtraction
T4	Rotation
T5	Move
T6	Subtraction
T7	Move (Z)
T8	Rotation

Thanks for your attention!