Curve Comparison Using esiCORA

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1 Abstract

CAE simulation is essential for the development of new vehicles and their integrated safety systems. The difficulty here is to assure correlation between simulation and test results. Common industrial practice is to compare time history results graphically. Such comparison is daily used in Injury Studies and thus it has to be accurate and reliable.

The CORA rating developed by <u>Partnership for Dummy Technology and Biomechanics</u> (PDB) calculates the correlation between two unique curves. The result is a number between zero and one, which indicates best correlation of test and simulation results, if the value is high (closer to one).

CORA combines Corridor method and Cross Correlation method to assess the correlation of the curves within a specified time range.

Visual-Environment, the single integrated environment for all your CAE needs. It includes a comprehensive modeling tool to generate quality meshes on complex geometries for various engineering domains ranging from Crash and Passenger Safety to NVH, Welding & Assembly, Casting, Electromagnetics, CFD & Multiphysics, and more...

Visual-Viewer is the Visual-Environment integrated post-processing tool for CAE applications, providing dedicated plotting solutions where CORA rating is embedded.

2 Introduction

CORA (Correlation and Analysis) rating is a curve comparison technique, to evaluate the time-history signals. It performs correlation analysis of simulation curves with reference curves (testing curves). This method is mainly used in injury studies.

In Visual-Viewer, the CORA rating can be computed using the following two options:

- esiCORA computation for the selected curves:
 - esiCORA Value, computes the CORA value and attaches it to the selected curve
 - **esiCORA Report**, generates a detailed report for the selected simulation and reference curve(s)
- esiCORA rating computation for an entire load case:
 - Allows generation of CORA report for multiple load cases and sub load cases

3 CORA rating for selected curve

Visual-Viewer provides a quick option to compute the CORA rating with minimum of user input. The CORA rating can be used to compute the CORA rating for the selected simulation- and the reference curves.

First user select one or several curves graphically from Visual-Viewer Plot Window or Explorer tree.



Fig.1: Using CORA Rating option for the selected curve with context menu

esiCORA Rating CORA Method : CORA Parameters : Parameters :	On selection esiCORA Rating option, you will get the esiCORA Rating GUI (Graphical User Interface) where user can select the desired reference curves.
Report Type : CORA Value Curve List CORA Value Filter : Image: Corve Name ID Curve Name Curve Name Curve Name	The Filter options enables to filter the curves which are displayed in the table by wildcard, match case as well as curve name or ID.
p1w1c2 ALL MODEL Internal Energy <nm> LD p1w1c3 ALL MODEL Total Energy<nm> p1w1c4 p1w1c4 ALL MODEL Average Velocity_Xon/s> p1w1c5 p1w1c5 ALL MODEL Average Velocity_Yon/s> p1w1c6 p1w1c6 ALL MODEL Average Velocity_Ton/s> p1w1c7 p1w1c7 ALL MODEL Average Velocity_magnitude m/s></nm></nm>	User can decide which Report Type he is interested in: • CORA Value as text or • CORA Report
All Pages O Current Page O List All O List Displayed Legend Display for All Curves Create Close	Fig.2: CORA Rating GUI

3.1 Report Type = CORA Value as text

The CORA rating value can be displayed as text which will be attached to the simulation curve as a text.



Fig.3: CORA Rating value will be attached to the curve

3.2 Report Type = CORA Report

The curves which are plotted in Visual-Viewer for the esiCORA report will be summarized and displayed in tables.



Signal Report

Rating of: S1SENS020000F00D / (N)/XYDATA

No.	Name				Rating	Weight
1	Corridor Method				0.9778	0.5
2	Correlation method	Value	Rating	Weight	0.9829	0.5
a	Cross correlation function	0.9964	0.9946	0.2		
ь	Size	0.9599	0.9599	0.4		
c	Phase shift	-0.0008	1.0	0.4		
3	Combination of 1 and 2	0.9803				
	Overall Rating:	0.9803				

Parameters	Evaluation Interval	0.0101-0.1711		
Method 1	Max. Half width of inner corridor	0.1		
	Max. Half width of outer corridor	0.5		
	Corridor Curve file	None		
	Reference value	3271.921		
	Transition exponent	2.0		
Method 2	Limits for phase shift	0.0048-0.0193		
	Rating Exponents(shape,size,phase)	3.0,1.0,1.0		

Fig.4: CORA Report will be created for the selected simulation and reference curves

4 CORA Report as a load case template

On selection of "Tools > CORA Report" option, user can create a full report with the help of load cases for several simulation curves.

This dialog is divided by two tab dialogs, $\ensuremath{\textbf{Parameters tab}}$ and $\ensuremath{\textbf{Loadcase tab}}.$

- \circ $\;$ With the Parameter tab, the user will be able to change the parameter or settings.
- Within the Loadcase tab user will specify the simulation and reference curves.

esiCORA Report							▲ ?	×
Parameters Loadcase								
TestCase								
	LoadCase Name	Description	WF	PreT_LC	PostT_LC	MinOrd_LC	MaxOrd_LC	
Subloadcase 1	Loadcase 1	loadcase Info	1.000000	-1.000000	-1.000000	1.000000	1.000000	
	SubloadCase Name	Description	WF	Method	Testdata Type			
	Subloadcase 1	Subloadcase I	1.000000	CORA 💙	NONE 💙			
	TestData Files	Browse	Input Unit	Input g	Time Shift			
	NONE	<u> </u>	mm kg 💌	YES 💙	0.0	Load File		
	Test Curve	Data Type	Filter					
	NONE	NONE	NONE 💙					
	Simulation Files	Browse	Input Unit	Input g	Time Shift	File Type		
	NONE	<u> </u>	mm kg 💌	YES 💙	0.0	NONE 💙		
	Simulation Curves	Data Type	Filter	TestData Cur	Biofidelity Rating	Parameters	Curve Info	WF
	NONE	NONE	NONE 💙	NONE	NONE	Global 💙	Info	1.000000
Add Loadcase Add Subloadcase	Add Row						Save	Pestore
Delete Leadcare	Doloto Row							(Cotor Criti
Delete Luducase	Delete Kow							
							Create	Close

Fig.5: esiCORA Report dialog

4.1 The Parameters Tab dialog

This dialog provides the option to modify the CORA report parameters and CORA report settings parameters and displays the global CORA Computation parameter values.

Parameters Value A_THRES 0.030 B_THRES 0.037 B_THRES 0.037 A_EVAL 0.011 B_DELTA_END 0.2 t_min automs K 2 G_1 0.05 a_0 0.011 b_0 0.55 a_0 0.01 b_sigma 0.00 D_MIN 0.030 K_KV 33 K_GG 11 K_V 33 K_GG 11 G_V 0.22 G_G 0.44 G_2 0.05 WF_NORM YES MIN_NORM 0.0 YNORM exterm Pet_LC -1 d_min globa d_min globa d_min Sploba OUTPUT_FORMAT PMACAS	2		Parameters Summary Page Info Loadcase Page Info Subloadcase Page Info Curve Title	Family Arial Arial Arial	> >	Siz 16	e V	Style	C	olor
A_THRES 0.030 B_THRES 0.077 A_EVAL 0.011 B_DELTA_END 0.2 L_min adloma L_max adloma L_max adloma L_max adloma K 2 G_1 0.5 a_goma 0.0 D_sigma 0.0 D_MIN 0.030 MIN_MAX 0.12 INT_MIN 0.80 K_V 33 K_G 1 G_Y 0.2 G_G 0.04 G_2 0.55 WF_NORM YES MIN_NORM 0.0 YNORM exterum Poat_LC -1 d_min globa d_min globa DOTFUT_FORMAT PAMCAS	>		Summary Page Info Loadcase Page Info Subloadcase Page Info Curve Title	Arial Arial Arial	* *	16	~			
B_THRES 0075 A_EVAL 0011 D_DELTA_END 0.2 t_min automa t_max automa K 2 G_1 0.5 a_goma 0.0 b_0 0.5 a_gigma 0.0 D_MIN 0.03 D_MAX 0.11 K_G 1 G_G 0.0 MIN_MORM 0.03 D_MAX 0.12 G_G 0.4 G_P 0.4 G_2 0.5 WF_NORM YES MIN_NORM 0.0 YNORM edtemm Peat_LC -1 d_min globa d_max globa d_max globa DES_MOD CORAR	2		Loadcase Page Info Subloadcase Page Info Curve Title	Arial Arial	~			Normal	\sim	
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t_max automa K 2 G_1 0.5 a_0 0.1 b_0 0.5 a_sigma 0.0 D_MIN 0.03 D_MAX 0.12 INT_MIN 0.03 K_G 11 K_V 33 K_G 1 K_V 0.2 G_G 0.4 G_P 0.4 G_2 0.5 WF_NORM YES MIN_NORM 0.0 VNORM exterum Post_LC -1 d_min globa d_min globa d_min Sploba DES_MOD CORAR	0		Curve Rating	Arial	~	16	~	Normal	~	
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G_1 05 a_0 01 b_0 05 a_sigma 00 D_MIN 0.03 D_MIN 0.03 D_MAX 0.12 INT_MIN 0.08 K_V 3 K_G 1 G_V 02 G_G 0.4 G_P 0.4 G_2 0.5 WF_NORM YES MIN_NORM 0.0 YNORM edrem. Pet_LC -1 d_min globa d_max globa d_max globa DES_MOD CCRA R			Axis Labels	Arial	~	12	~	Bold	~	
a_0 0.1 b_0 0.5 s_sigma 0.0 D_MIN 0.0 D_MAX 0.1 D_MAX 0.12 INT_MIN 0.08 K_V 3 K_G 1 K_V 0.2 G_G 0.4 G_P 0.4 G_2 0.5 WF_NORM YES MIN_NORM 0.0 YNORM externm. Post_LC -1 d_min globa d_max globa OLPOTIFORMAT PAMACA			Tabular Rating Info	Arial	~	16	~	Bold	~	
b_0 0.5 a_sigma 0.0 b_sigma 0.0 D_MIN 0.03 D_MAX 0.12 INT_MIN 0.80 K_C 1 K_C 1 G_V 0.2 G_G 0.44 G_P 0.44 G_Z 0.05 WF_NORM YES MIN_NORM 0.0 YNORM eddem Pest_LC -1 d_min globa d_max globa DES_MOD CORA R										
a_sigma 0.0 b_sigma 0.0 D_MIN 0.03 D_MAX 0.12 INT_MIN 0.80 K_V 3 K_FP 1 K_P 1 G_V 0.22 G_S 0.44 G_P 0.04 G_2 0.05 WF_NORM YES NIN_NORM 0.00 YNORM extrem. globa d_mm globa d_mm globa globa d_max globa d_mACRAS DES_MOD CORAR. Streamed			Parameters					Att	tributes	
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D_MN 0.03 D_MAX 0.12 D_MAX 0.12 INT_MIN 0.80 K_V 3 K_G 1 K_P 1 G_G 0.44 G_P 0.44 G_2 0.55 WF_NORM YES MIN_NORM 0.00 YNORM externm Post_LC -1 d_min globa d_max globa OUTPUT_FORMAT PAMChas DEMOD CORA R			Simulation Cur	/e						
D_MAX 012 INT_MIN 0.80 K_V 33 K_G 1 K_P 1 G_V 0.22 G_G 0.44 G_P 0.44 G_2 0.55 WF_NORM YES MIN_NORM 0.00 YNORM extrem. Post_LC -1 d_min globa d_max globa DIFUT_FORMAT PAMCHAS DES_MOD CORAR.			Average Test Cu	irve						
INT_NIN 0.80 K_V 3 K_G 11 K_V 0.2 G_G 0.4 G_P 0.4 G_Z 0.5 WF_NORM YES MIN_NORM 0.0 YNORM extrem. Post_LC -1 d_min globa d_max globa DIFUT_FORMAT PAMCAS DES_MOD CORA R.			Testdata 1 Cur	/e						
K_V 3 K_G 1 K_P 1 G_V 0.2 G_G 0.4 G_P 0.4 G_2 0.5 WF_NORM YES YNORM 0.0 YNORM 0.0 YNORM 0.0 YNORM 0.0 UTNORM 0.0 UTNORM 0.0 OUTPUT_FORMAT 1 Jeros prop CORA R.			Testdata2 Cur	/e						
K_G 1 K_P 1 G_V 0.2 G_G 0.4 G_P 0.4 G_Z 0.5 WF_NORM YES MIN_NORM 0.0 YNORM extrem. PietT_LC -1 PostT_LC -1 d_min globa d_max globa DIFUT_FORMAT PAMCAS DES_MOD CORA R.			Testdata3 Cur	/e						
K_P 1 G_V 0.2 G_G 0.4 G_P 0.4 G_2 0.5 WF_NORM YES MIN_NORM 0.0 YNORM externme PestT_LC -1 d_min globa d_max globa DUTPUT_FORMAT PAMCAS DES_MOD CORA R.			Testdata4 Curve							
G_V 0.2 G_G 0.4 G_P 0.4 G_Z 0.5 WF_NORM YES MIN_NORM 0.0 YNORM edrem. Prot_LC -1 Post_LC -1 d_min globa d_max globa DES_MOD CORA R. DES_MOD CORA R.			Testdata5 Curve							
G_G 0.4 G_P 0.4 G_Z 0.5 WF_NORM YES MIN_NORM 0.0 YNORM extrem. PieT_LC .1 Post_LC .1 d_min globa d_max globa DIFUT_FORMAT PAMCHAS DES_MOD CORA R.			Time Interval Cu	rve						
G.P 0.4 G.2 0.5 WF_NORM YES MIN_NORM 0.0 YNORM externm. Pet_LC .1 Pet_LC .1 d_min globs d_mix globs OUTPUT_FORMAT PAMCAS Petraction CORA Rd			Plot Background	nd						
G.2 0.5 WF_NORM YES MIN_NORM 0.0 YNORM extrems Prot_LC .1 Post_LC .1 d_min globs d_max globs OUTPUT_FORMAT PAMCAS DES_MOD CORA R DES_MOD CORA R			Plot Margin							
WF_NORM YES MIN_NORM 0.0 YNORM extrem. PetT_LC -1 d_min globa d_max globa OUTPUT_FORMAT PAMCAB DES_MOD CORA R.			Line Type Settings							
MIN_NORM 0.0 YNORM extrem. PwT_LC .1 d_min globa d_max globa OUTPUT_FORMAT PAMCRAS DES_MOD CORA R. Area CORA R.			Simulation Cur	/e				Conti	nuous	~
YNORM extrem. PreT_LC .1 Pear_LC .1 d_min globa d_max globa DES_MOD CORA Ra DES_MOD CORA Ra			Average Test Cu	irve				Conti	nuous	~
Pert_LC -1 PostT_LC -1 d_min globa d_max globa OUTPUT_FORMAT PAMCARA DE MOD CORA Ra	1		Time Interval Cu	rve				Conti	nuous	~
PostT_LC .1 d_min globa d_max globa OUTPUT_FORMAT PAMCRAS DES_MOD CCRA R DES_MOD CCRA R			Inner Corridor Cu	rve				Conti	nuous	~
d_min globa d_max globa OUTPUT_FORMAT PAM-CRAS DES_MOD CORA Ra			Outer Comdor Cu	irve				Conti	nuous	~
d_max globa OUTPUT_FORMAT PAM-CRAS DES_MOD CORA RA			Line Thickness							
OUTPUT_FORMAT PAM-CRAS DES_MOD CORA Ra			Simulation Cur	/e					2.0	
DES_MOD CORA Ra	ł		Average Test Cu	irve					2.0	
050.010	ng		Time Interval Cu	rve					2.0	
DES_GLO Data S	t.		Inner Corridor Cu	rve					2.0	
REPORT PATH D:/Tem	/	*	Outer Comdor Cu	irve					2.0	
	>		Marker Settings							
						Res	set	Save.		Resto

Fig.6: Parameters Tab Dialog

Parameters	Description					
A_THRES	Threshold to set the start of the interval of evaluation [0,,1]					
B_THRES	Threshold to set the end of the interval of evaluation [0,,1]					
A_EVAL	Extension of the interval of evaluation [0,,1]					
B_DELTA_END	Additional parameter to shorten the interval of evaluation (width of the corridor:					
	A_DELTA_END*Y_NORM) 0 = disabled					
T_MIN	Set the evaluation interval (tmin - tend) for all signals tmin =max (ta-αevlau(
	tb-ta), tstart)					
T_MAX	tmax =min (ta+ α evlau(tb-ta), tend)					
К	Transition between ratings of 1 and 0 of the corridor method [-] (1 = linear, 2 =					
	quadratic)					

The description of the global CORA computation parameters is explained in the Visual-Viewer help.

Table 1: A sample of the customizable CORA computation parameters

4.2 The Loadcase Tab dialog

The load case dialog provides the option to create load cases and sub load cases. With this load cases, you can create as many complex scenarios you like. This dialog will have Tree View for better navigation and Loadcase table to assign the curves and specifies the parameter.

The **Tree view** shows the defined load case and sub load cases.

On Selecting "TestCase" tree item in the tree control, then all Load Cases info will be displayed in the Table. Subsequent on Selecting the particular Loadcase, say "Loadcase 1", the corresponding Loadcase information will be populated in the table.

esiCORA Report							▲ ?	×
Parameters Loadcase								
☐ TestCase								
	LoadCase Name	Description	WF	PreT_LC	PostT_LC	MinOrd_LC	MaxOrd_LC	
Subloadcase 1	Loadcase 1	loadcase Info	1.000000	-1.000000	-1.000000	1.000000	1.000000	
	SubloadCase Name	Description	WF	Method	Testdata Type			
	Subloadcase 1	Subloadcase I	1.000000	CORA 🖌	NONE 🚩			
	TestData Files	Browse	Input Unit	Input g	Time Shift			
	NONE	<u>F</u>	mm kg 🚩	YES 💙	0.0	Load File		
	Test Curve	Data Type	Filter					
	NONE	NONE	NONE 💙					
	Simulation Files	Browse	Input Unit	Input g	Time Shift	File Type		
	NONE	<u>F</u>	mm kg 🎽	YES 💙	0.0	NONE		
	Simulation Curves	Data Type	Filter	TestData Cur	Biofidelity Rating	Parameters	Curve Info	WF
	NONE	NONE	NONE Y	NONE	NONE	Global 🛛 🗡	Info	1.000000
	1							
Add Loadcase Add Subloadcase	Add Row						Save F	Restore
Delete Loadcase Delete Subloadcase	Delete Row							
							Create	Close

Fig.7: Loadcase tab dialog to build-up different load cases

Each Load case contains several sub load case parameters. Multiple load cases can be added for CORA rating report computation.

4.2.1 Sub Load Case

On selecting the sub load case item in the tree control, the corresponding sub load case data will be shown in the table, only. This allows focusing on specific load case data.

TestCase								
Loadcase 1	SubloadCase Name	Description	WF	Method	Testdata Type			
Subloadcase 1	Subloadcase 1	Subloadcase I	1.000000	CORA 🖌	NONE 💙			
	TestData Files	Browse	Input Unit	Input g	Time Shift			
	NONE	6	mm kg 💌	YES 💙	0.0	Load File		
	Test Curve	Data Type	Filter					
	NONE	NONE	NONE 💙					
	Simulation Files	Browse	Input Unit	Input g	Time Shift	File Type		
	NONE	F	mm kg 💌	YES 💙	0.0	NONE 💙		
	Simulation Curves	Data Type	Filter	TestData Cur	Biofidelity Rating	Parameters	Curve Info	WF
	NONE	NONE	NONE 💙	NONE	NONE 💙	Global 💙	Info	1.00

Fig.8: Sub Loadcase table

With the parameters, you can specify the sub load case name and a description, the CORA computation method, WF (weight factor), Solver type, Validation case, Test data files, the Test data curves as well as the Simulation data files and the Simulation data curves.

The complete set of tests can be applied by defining a load case for each body region and a sub load case for each test. The weighting factors and corridors can be modified accordingly in the table.

4.2.2 Test Data Files

The **Test Data file** will be taken as an input and used for the correlation analysis of simulation curve. Multiple files can be selected for test data. The average of the selected curves will be created. The average curve will be used in CORA rating computation.

For each test file, you can specify the input unit system and optional an offset for the time shift. The option **Load File** is used to load the test data file. If the file is already loaded, then a message will be posted weather to reload the file or not.

Filter: Match case	DataTypes	-	x
ACCELERATION DISPLACEMENT VELOCITY ENERGY FORCE MOMENT FREQUENCY MASS PRESSURE TIME VOLUME ROTATION g	Filter:	🔽 📃 Match case	۲
	ACCELERATION DISPLACEMENT VELOCITY ENERGY FORCE MOMENT FREQUENCY MASS PRESSURE TIME VOLUME ROTATION 9		

The test data file curve names will be listed as per the first test data file. If more than one test data file is added, the selected curve will be created from all the test data files for CORA rating computation.

If necessary user can specify the test data curve data type. On click of the appropriate cell the curve data types dialogue will be posted as shown on the picture on the right.

Fig.9: Specify the data type for each test data

4.2.3 Simulation Files

The CORA rating will be performed on the simulation curve with reference to the test curves. For each file user can optionally specify the input unit system and a time shift offset.

By default, when the Load Case dialog is posted, the data will be shown for one load case and one sub load case. Multiple load cases and sub load cases can be easily added using the "Add" buttons.

On selection of this "Simulation Curve" cell, the following dialog will be posted to select the simulation curve.



Fig.10: Selection of the simulation curves with its entities and ordinates

For the simulation curve name, the name mapping will be done based on the entity id, entity type and component.

There are options to specifies the curve **Data Type** for simulation as well for the test data curve. Both the test and simulation curves should have the same data type.

On click of the **Save** button, the load case data will be saved to the load case configuration xml file. On click of this **Restore** button, the load case data from the load case configuration file will be read and update the same to the CORA Report dialog.

esiCORA supports working with Visual-Viewer **templates** and **session files**. Both options allows to run the esiCORA in **batch mode**.

4.3 Sample CORA Report

Here below you will see a "sample CORA Report" for one load case having two sub load cases and each sub load case is having one signal.

case 1	LoadCase Name	Description	WF	PreT_LC	PostT_LC	MinOrd_LC		MaxOrd_LC	
dcase 1	Loadcase 1	loadcase Info	1.000000	-1.000000	-1.000000	1.000000		1.000000	
adcase 1	SubloadCase Name	Description	WF	Method	Testdata Type				
	Subloadcase 1	Subloadcase I	1.000000	CORA 🗹	NONE 🗠				
	TestData Files	Browse	Input Unit	Input g	Time Shift				
	D:/VV12.5/CORAReport/s		mm kg 🚩	YES 🚩	0.0	Load File			
	Test Curve	Data Type	Filter						
	S1SENS010000DS0D / (m)	DISPLACEME	NONE 🗠						
	Simulation Files	Browse	Input Unit	Input g	Time Shift	File Type			
	D:/VV12.5/CORAReport/s	6	mm kg 🚩	YES 💙	0.0	NONE	~		
	Simulation Curves	Data Type	Filter	TestData Cur	Biofidelity Rating	Parameters		Curve Info	WF
	S1SENS010000DS0D / (m)	DISPLACEME	NONE Y	S1SENS010000	NONE	Modify	\sim	Info	1.000000
	LoadCase Name	Description	WF	PreT_LC	PostT_LC	MinOrd_LC		MaxOrd_LC	
	Loadcase 2	loadcase Info	1.000000	-1.000000	-1.000000	1.000000		1.000000	
	SubloadCase Name	Description	WF	Method	Testdata Type				
	Subloadcase 1	Subloadcase I	1.000000	CORA 💙	NONE 💙				
	TestData Files	Browse	Input Unit	Input g	Time Shift				
	D:/VV12.5/CORAReport/s	6	mm kg 🚩	YES 💙	0.0	Load File			
	Test Curve	Data Type	Filter						
	S1SENS020000FO0D / (N)	FORCE	NONE 🗠						
		Browse	Townshill be the	Toput a	Time Shift	File Type			
	Simulation Files	brombein	Input Unit	input g					
	Simulation Files D:/VV12.5/CORAReport/s	<u></u>	mm kg 💙	YES Y	0.0	NONE	۷		
	Simulation Files D:/VV12.5/CORAReport/s Simulation Curves	Data Type	mm kg Y	YES YES	0.0 Biofidelity Rating	NONE Parameters	~	Curve Info	WF

Fig.11: Sample CORA Report

The report will have pages for the summary report, load case report and experiment report pages as shown below.



Fig.12: Page 1 of the sample esiCORA Report



Fig. 13: Page 2 of the sample esiCORA Report

	CORA	Rating	get it righ
Expe Rating	riment Report		
Descrip	ption: Subloadcase Info		
No.	Signal	Rating	Weight
1	S1SENS010000DS0D / (m)	0.86	1.0
	ΤΟΤΑΙ	0.86	

Fig.14: Page 3 of the sample esiCORA Report



Fig. 15: Page 4 of the sample esiCORA Report



Fig.16: Page 5 of the sample esiCORA Report



Fig.17: Page 6 of the sample esiCORA Report

5 Summary

The esiCORA rating is a curve comparison technique to evaluate the time-history signals. It performs correlation analysis of simulation curves with reference curves (e.g.: test curves).

The esiCORA rating can be computed with minimum of user input and knowledge of all the CORA options using the right click menu for the selected curve. User can decide to get the CORA value assigned to the selected curves or plotting the corridors and rating parameter as a report.

With the second option user, can create a full CORA report for various load case and its sub load cases. It is possible to fill out CORA parameter in the GUI or load with a configuration file.

While running the esiCORA report all curves are saved to a user given directory. Beside the report a Power Point or PDF document will be created.

For automation esiCORA can be used in Visual-Viewer templates or session files.

6 Literature

References should be given in the last paragraph of your manuscript. Please use following scheme:

- [1] Users_manual_cora_36.pdf, Carsten Thunert, GNS mbH 2012, pages 68
- [2] CORrelation and Analysis (CORA) in Visual-Environment, Megha Seshadri ESI Group 2016