Report Generated by Test Manager

Title: Model Comparison - Test
Author: Gianvincenzo Daddabbo, Gaetano Gallo, Alberto Ruggeri, Martina Te desco, Alessandro Toschi
Date: 19-Apr-2021 11:12:12

Test Environment

Platform: PCWIN64
MATLAB: (R2019b)

Summary

Name	Outcome	Duration (Seconds)
Results: 2021-Apr-19 11:09:02	2 ✓ 6 ✗	125.533
Comparison Tests	2 ✓ 6 ✗	125.531
Free evolution	✓	88.653
Only throttle	✓	7.921
Constant steering	✗	5.234
Ramp steering	✗	8.576
Small sinusoidal steering	✗	4.261
Big sinusoidal steering	✗	3.605
Combined 1	✗	3.525
Combined 2	✗	3.667

Results: 2021-Apr-19 11:09:02

Result Type:	Result Set
Parent:	None
Start Time:	19-Apr-2021 11:09:03
End Time:	19-Apr-2021 11:11:08
Outcome:	Total: 8, Passed: 2, Failed: 6

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Comparison Tests

Test Result Information

Result Type:	Test Case Result
Parent:	Results: 2021-Apr-19 11:09:02
Start Time:	19-Apr-2021 11:09:03
End Time:	19-Apr-2021 11:11:08
Outcome:	Failed
Cause of Failure:	Test failed as iteration failed

Description:
This report aims to check congruences and differences between two vehicle models: Dynamic model and Kinematic model.

In all the comparisons, our Dynamic model is considered as the baseline.
For the tests purposes we have not included Equivalence Criteria, indeed this will be a qualitative analysis.

The only parameter we have set up is the relative tolerance, assigning to it a value of 1% in order to ignore the negligible offsets between the Dynamic and the Kinematic model.

Test Case Information

Name:	Comparison Tests
Type:	Equivalence Test

Free evolution

Test Result Information

Result Type:	Test Iteration Result
Parent:	Comparison Tests

Start Time: 19-Apr-2021 11:09:03
End Time: 19-Apr-2021 11:10:31
Outcome: Passed
Description:

Free Evolution

Test performed starting from an initial condition with input equal to 0

Test Case Information

Name: Free evolution
Type: Equivalence Test

Iteration Settings

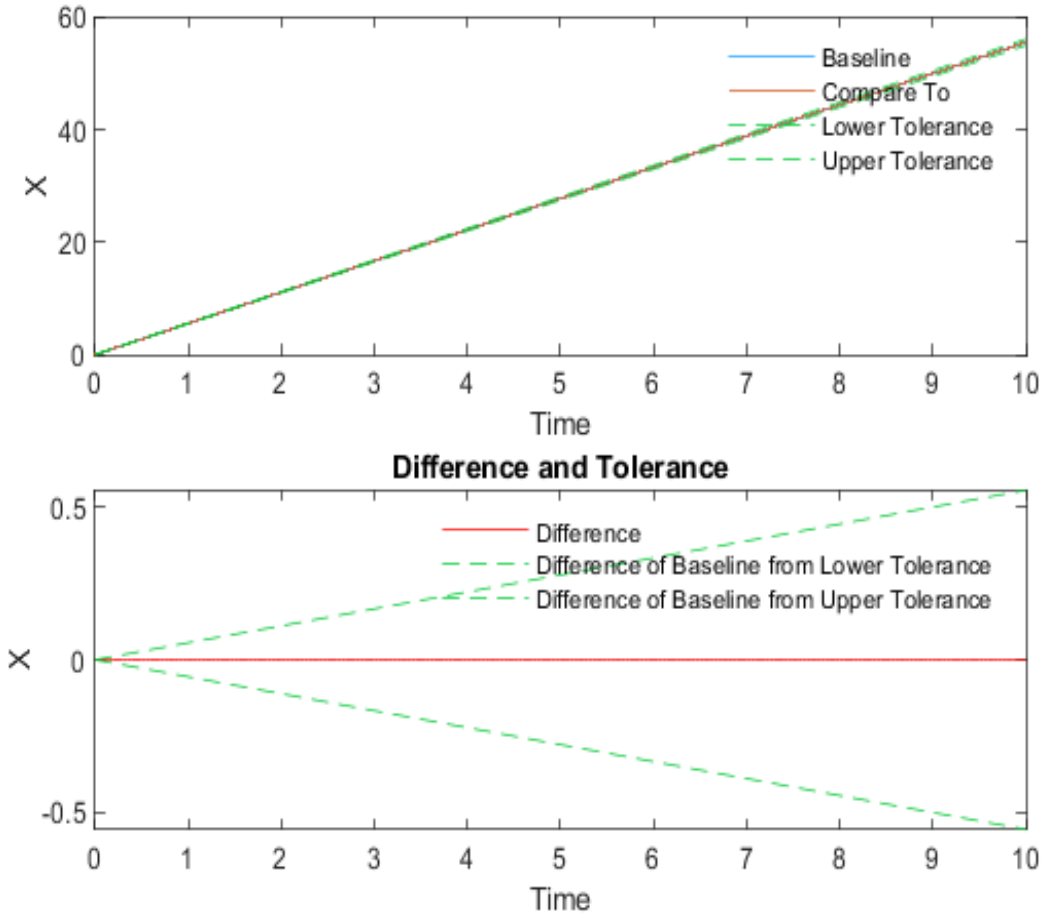
Test Overrides

Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Free_evolution.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Free_evolution.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	4.34e-19	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	4.34e-19	double		Continuous	double		0.001	linear	union



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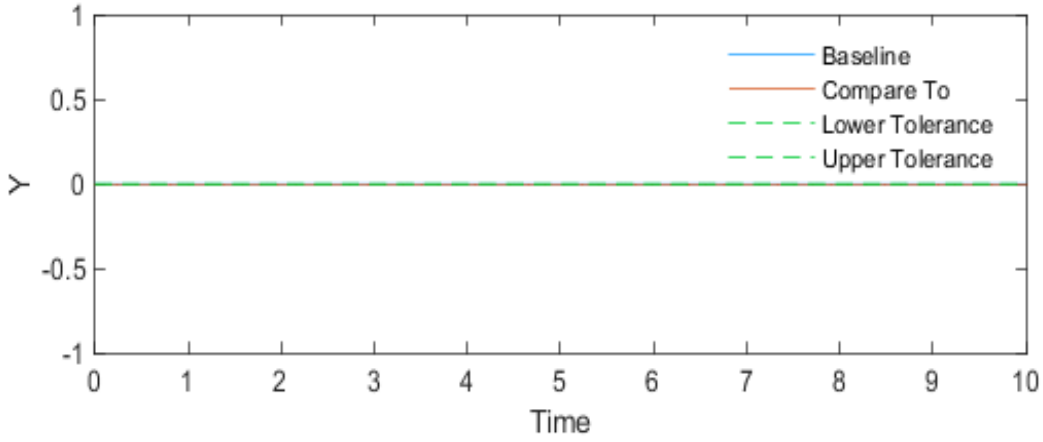
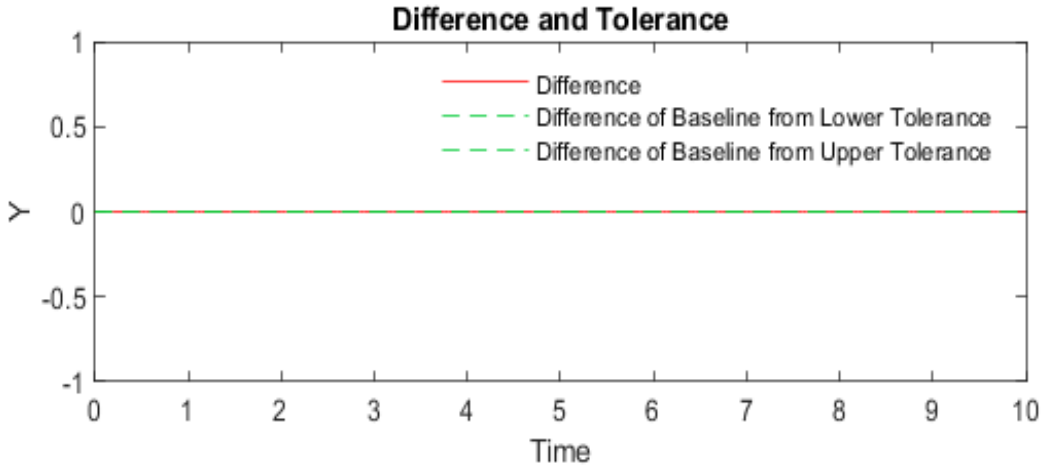
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union





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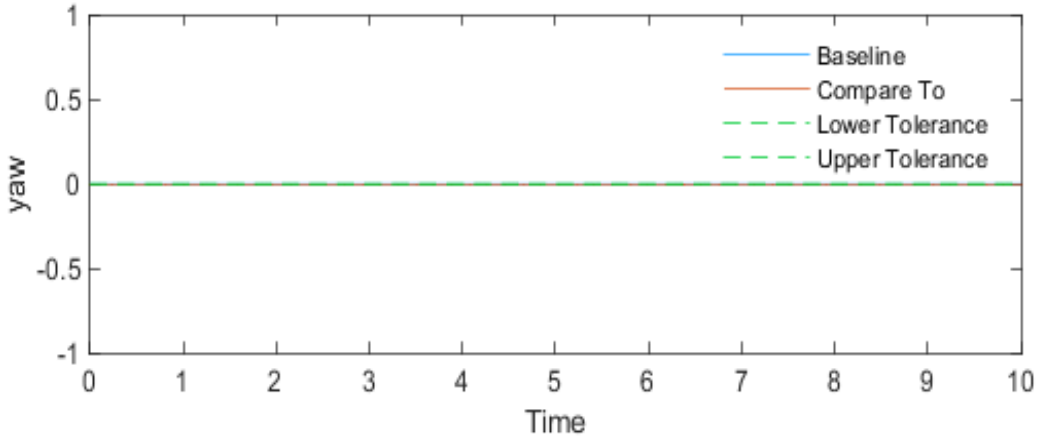
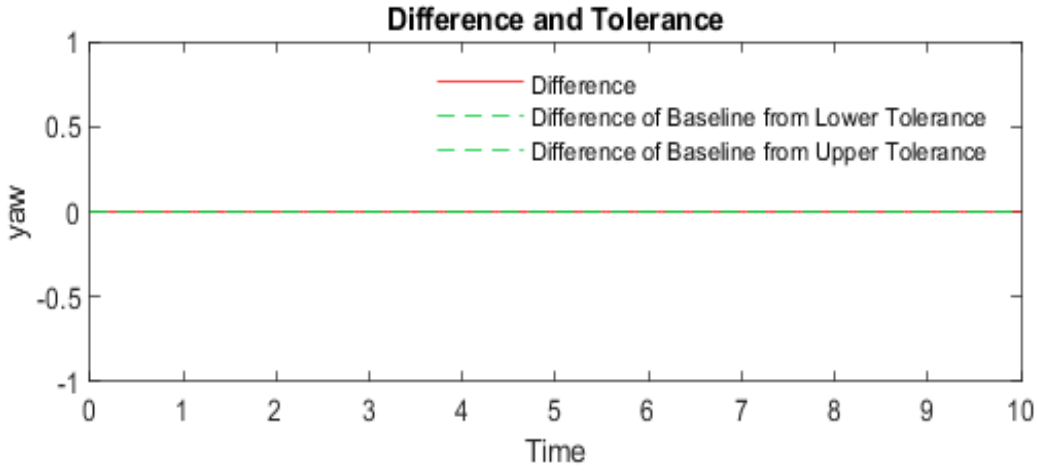
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union





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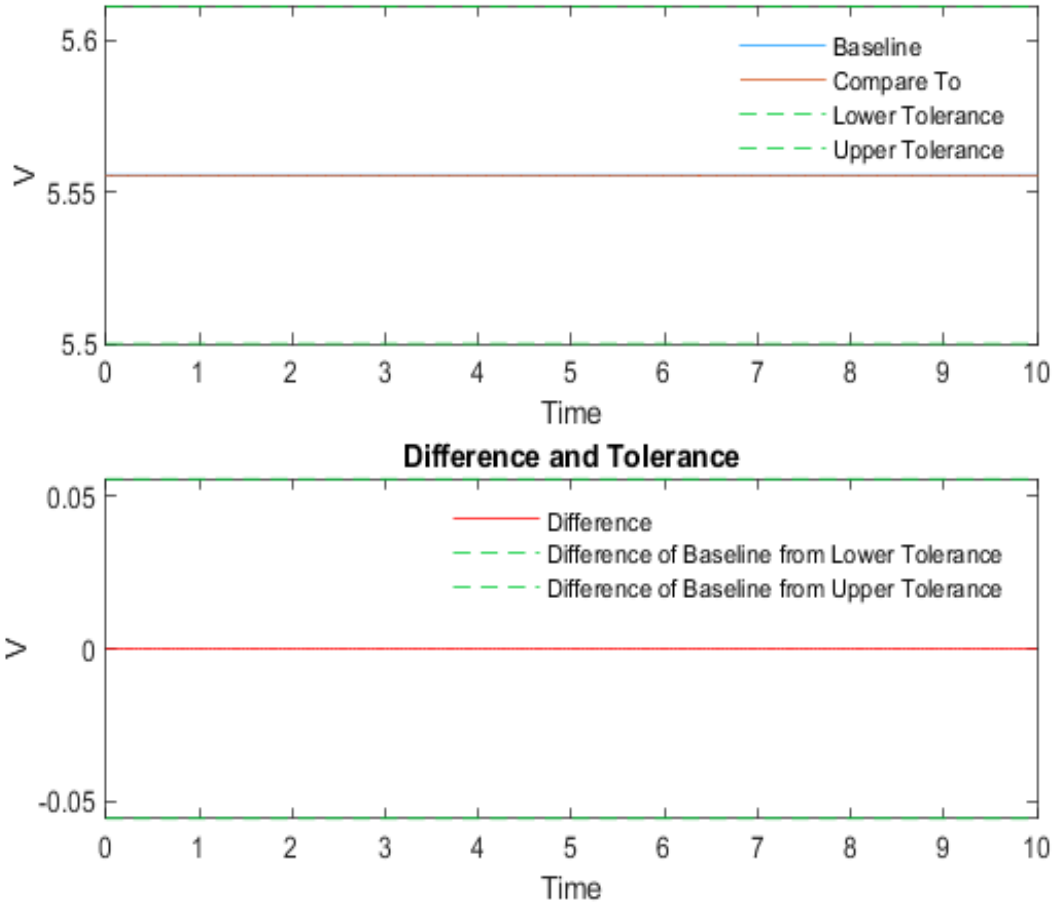
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Free_evolution.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Free_evolution.mat

Input Data 2

Input Information

External Input Name:	Free_evolution.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Free_evolution.mat

Simulation 1

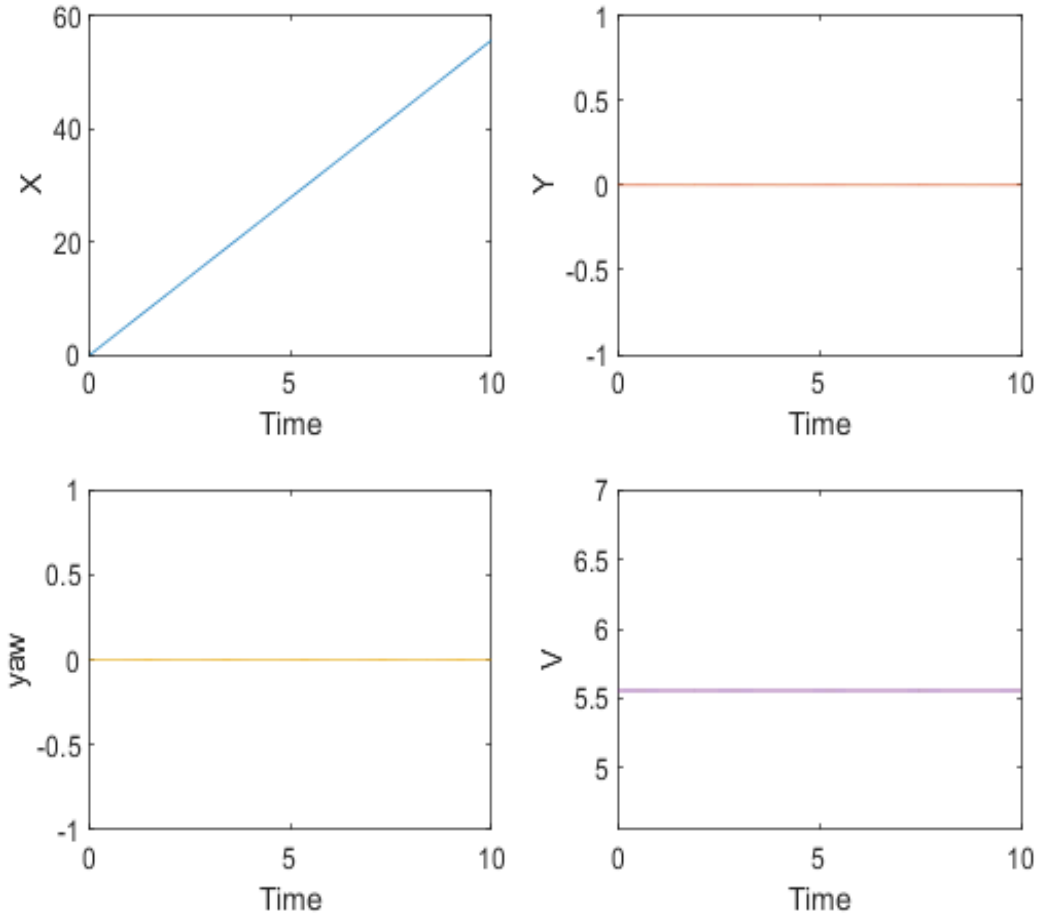
System Under Test Information

Model:	Model_compare_SLX
Harness:	Model_comparison_dynamic
Harness Owner:	Model_compare_SLX/Dynamic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Free_evolution.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Free_evolution.mat
Start Time:	0
Stop Time:	10
Checksum:	1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

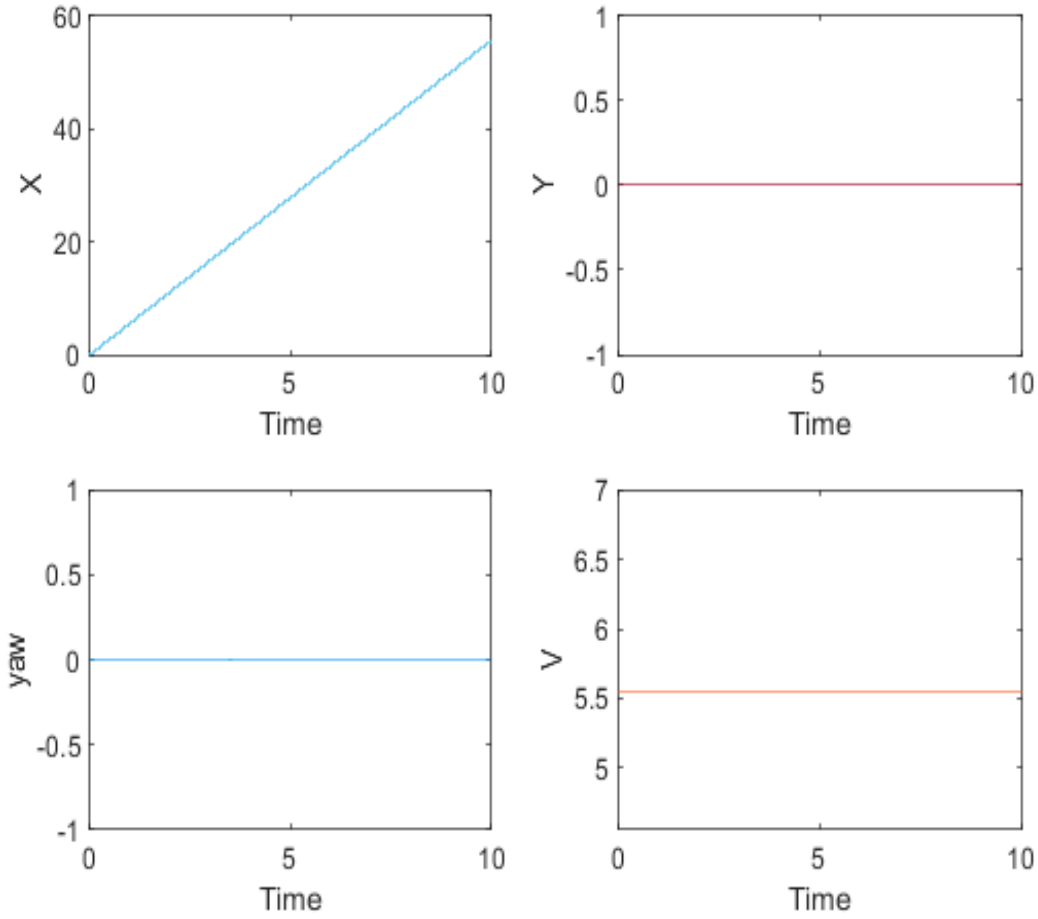
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Free_evolution.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Free_evolution.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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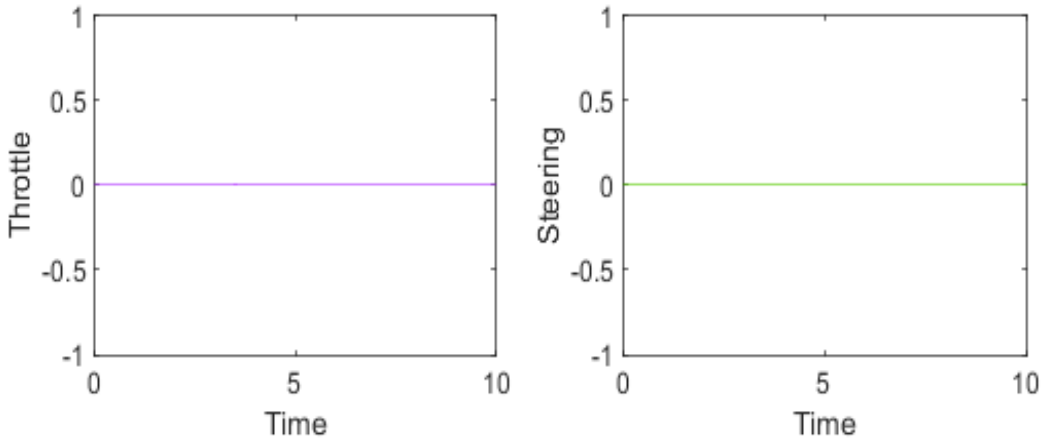
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Only throttle

Test Result Information

Result Type: Test Iteration Result
Parent: Comparison Tests
Start Time: 19-Apr-2021 11:10:31

End Time: 19-Apr-2021 11:10:39
Outcome: Passed
Description:

Only throttle

Test performed keeping the steering angle equal to 0 and varying the throttle

Test Case Information

Name: Only throttle
Type: Equivalence Test

Iteration Settings

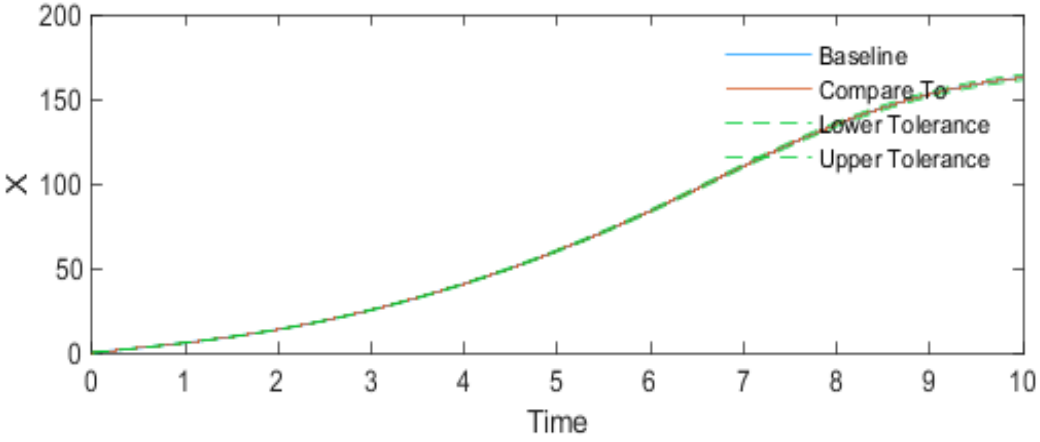
Test Overrides

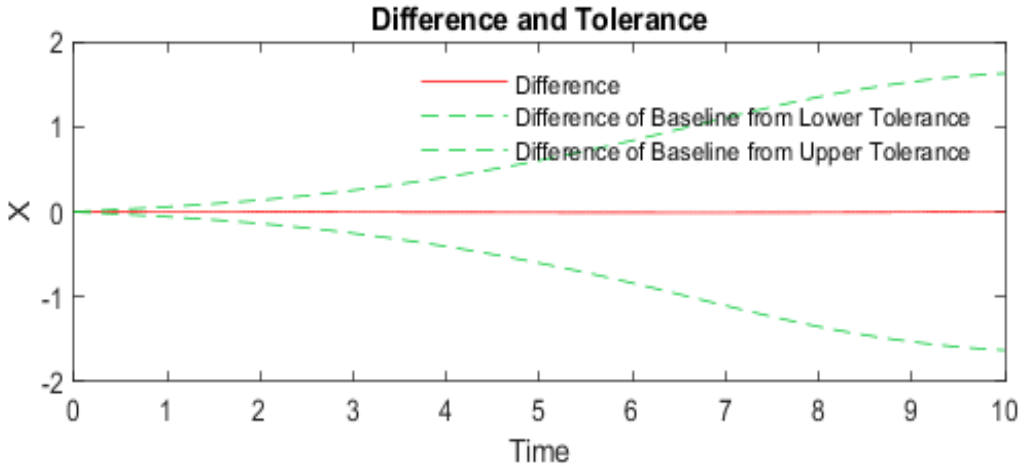
Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Only_throttle.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Only_throttle.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	0.0107	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	0.0107	double		Continuous	double		0.001	linear	union





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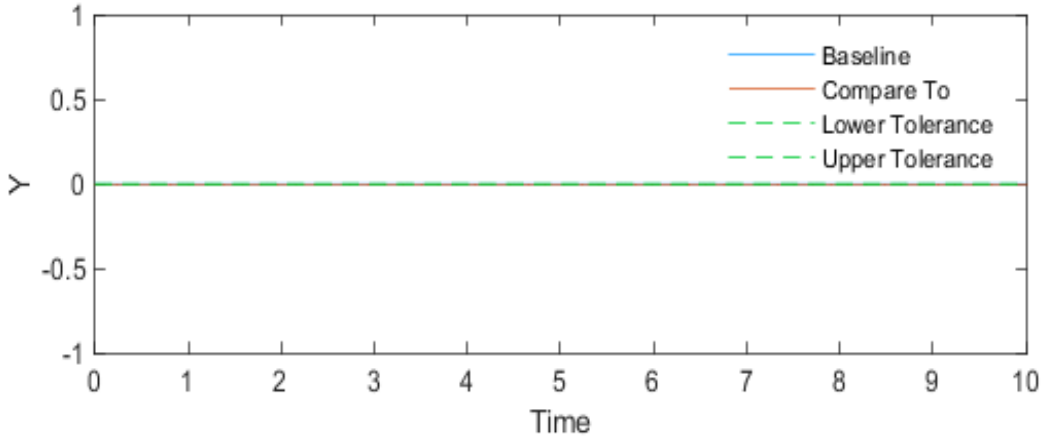
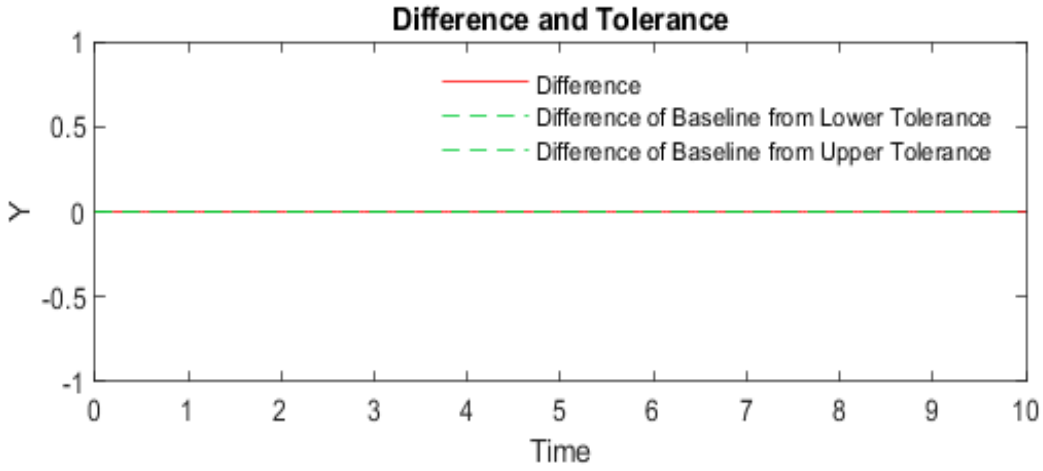
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union





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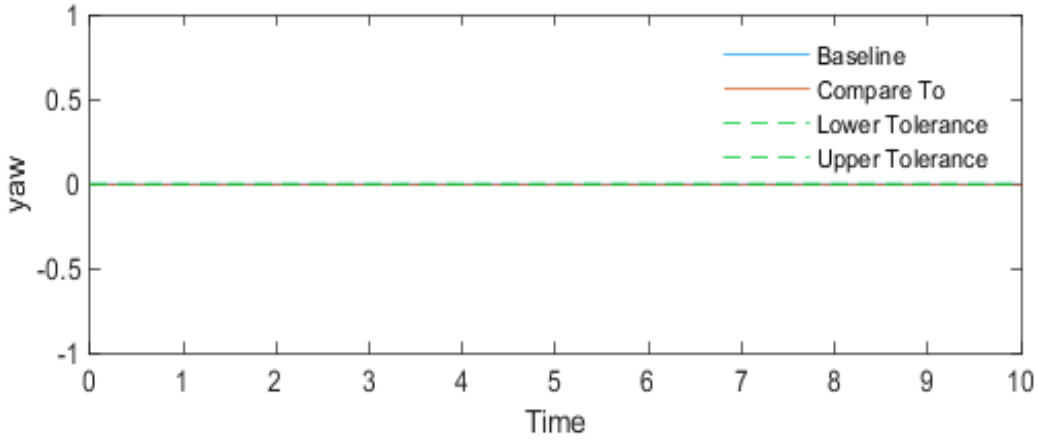
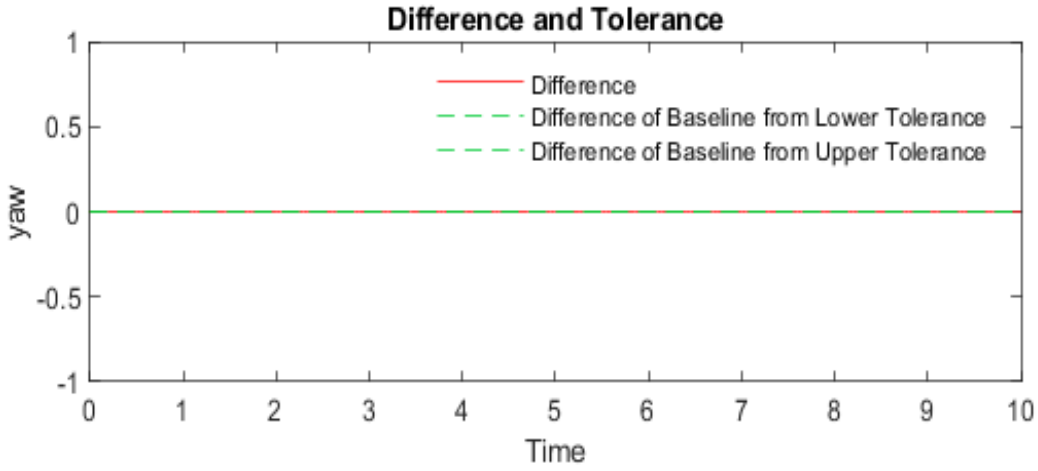
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union





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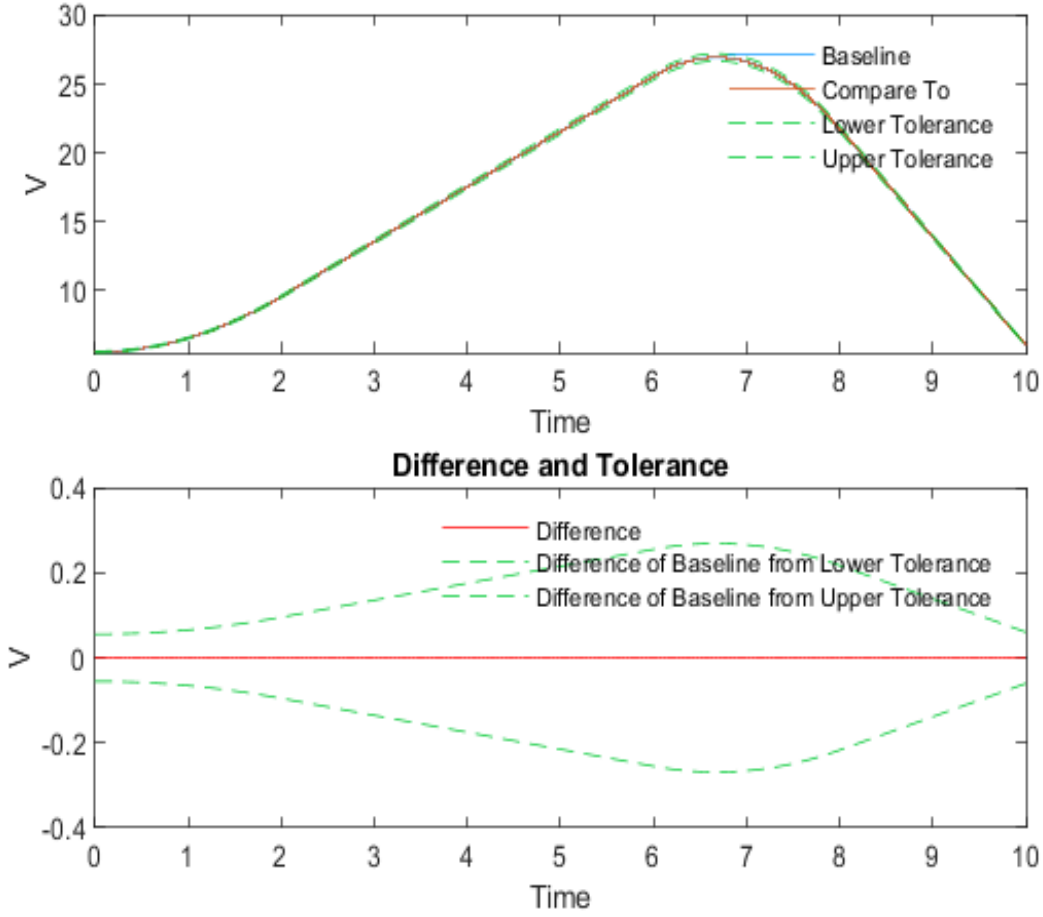
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	0	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Only_throttle.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Only_throttle.mat

Input Data 2

Input Information

External Input Name: Only_throttle.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Only_throttle.mat

Simulation 1

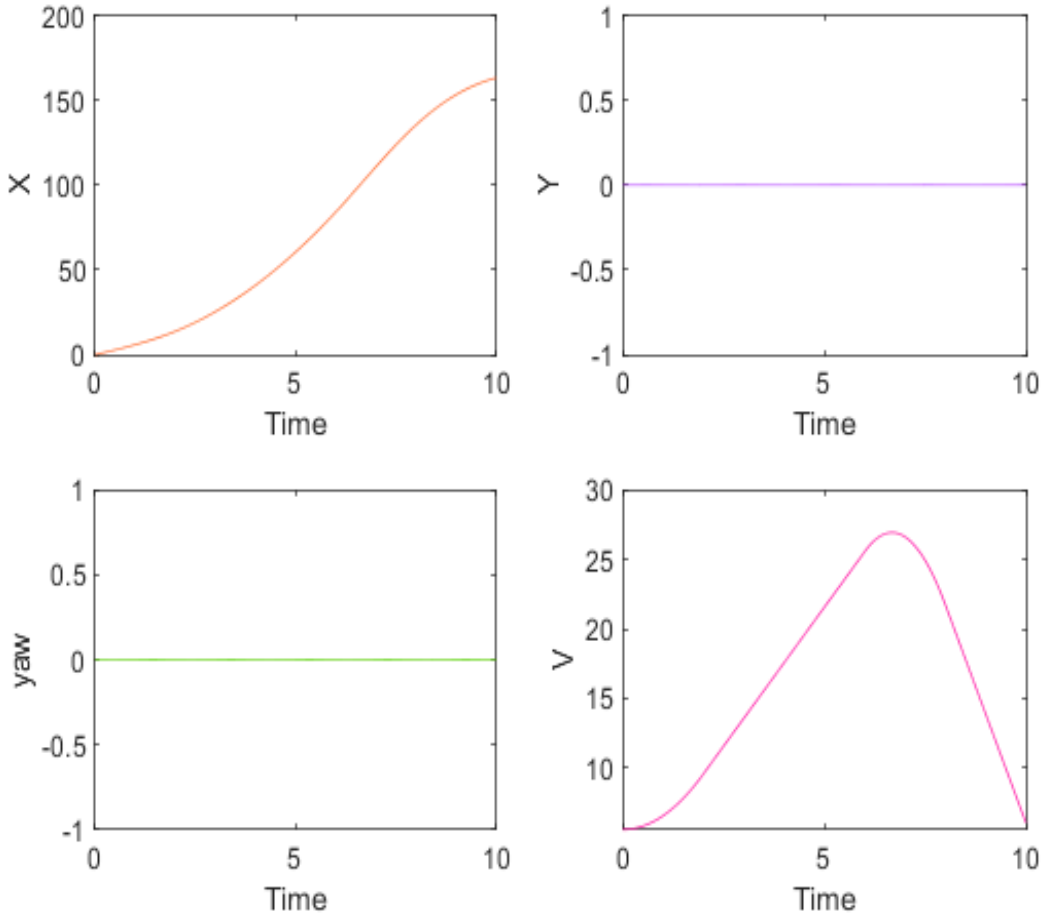
System Under Test Information

Model: Model_compare_SLX
Harness: Model_comparison_dynamic
Harness Owner: Model_compare_SLX/Dynamic_model
Simulation Mode: normal
Override SIL or PIL Mode: 0
Configuration Set: Configuration1
External Input Name: Only_throttle.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Only_throttle.mat
Start Time: 0
Stop Time: 10
Checksum: 1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

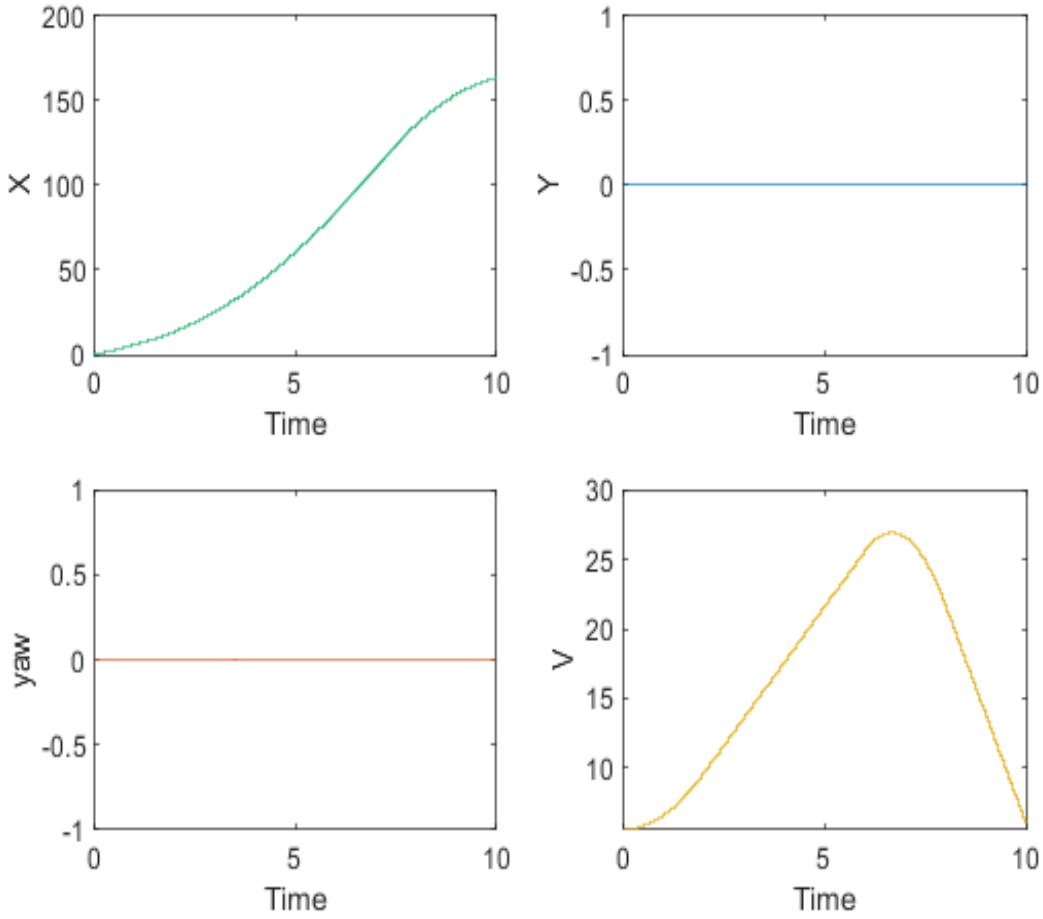
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Only_throttle.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Only_throttle.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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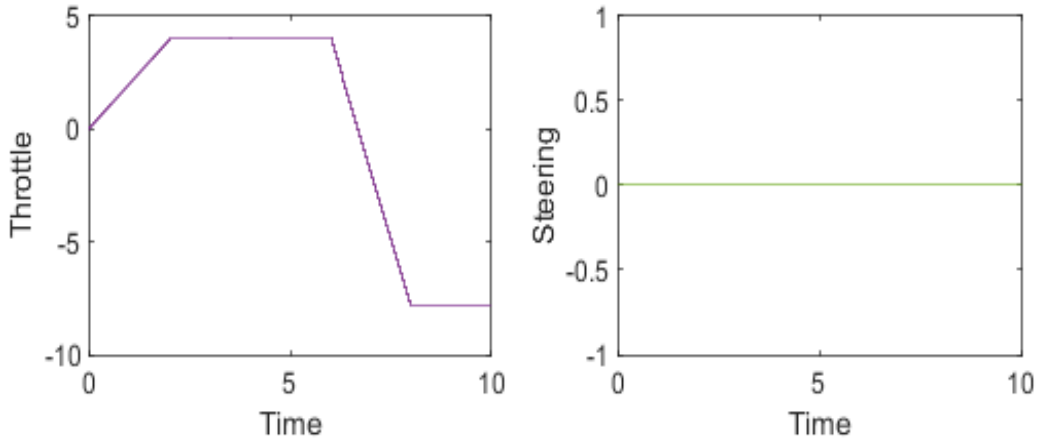
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Constant steering

Test Result Information

Result Type: Test Iteration Result
Parent: Comparison Tests
Start Time: 19-Apr-2021 11:10:39

End Time: 19-Apr-2021 11:10:45
Outcome: Failed
Cause of Failure: Failed criteria: Equivalence
Description:

Constant steering

Test performed keeping the throttle equal to 0 and giving a constant steering angle value

Test Case Information

Name: Constant steering
Type: Equivalence Test

Iteration Settings

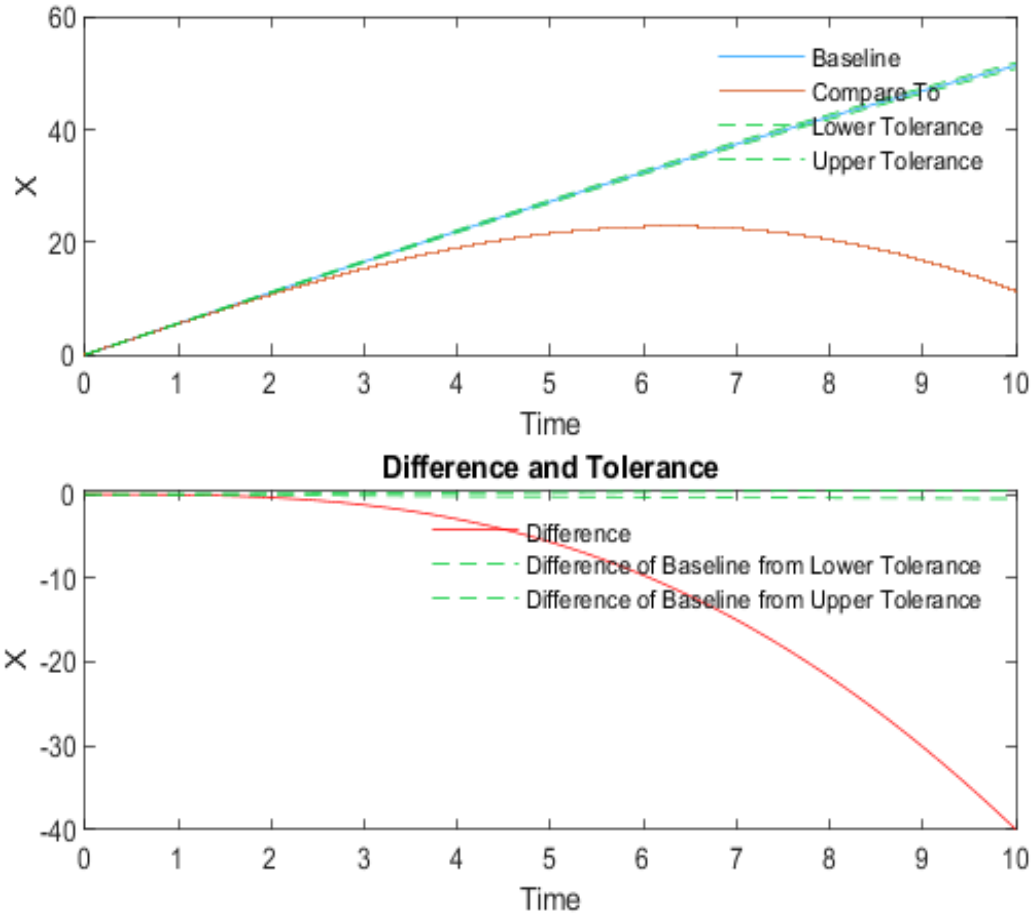
Test Overrides

Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Constant_steering.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Constant_steering.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	40	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	35	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	0.687	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	0.0792	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	40	double		Continuous	double		0.001	linear	union



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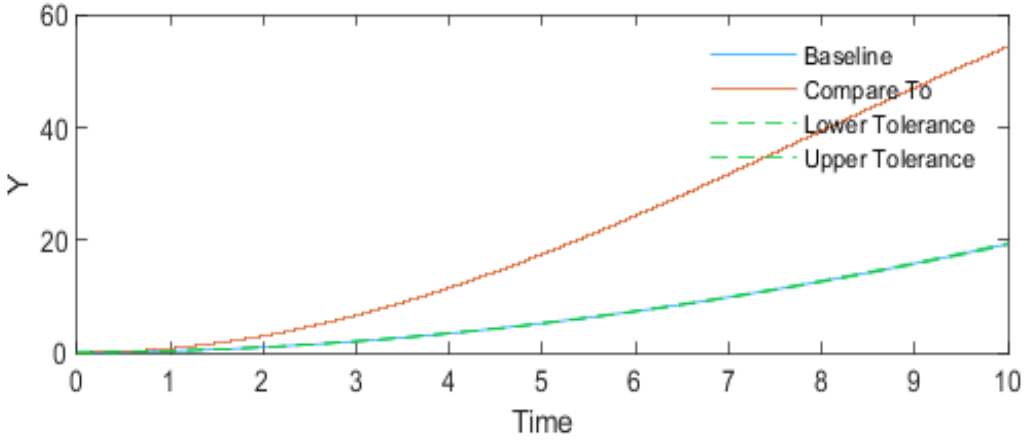
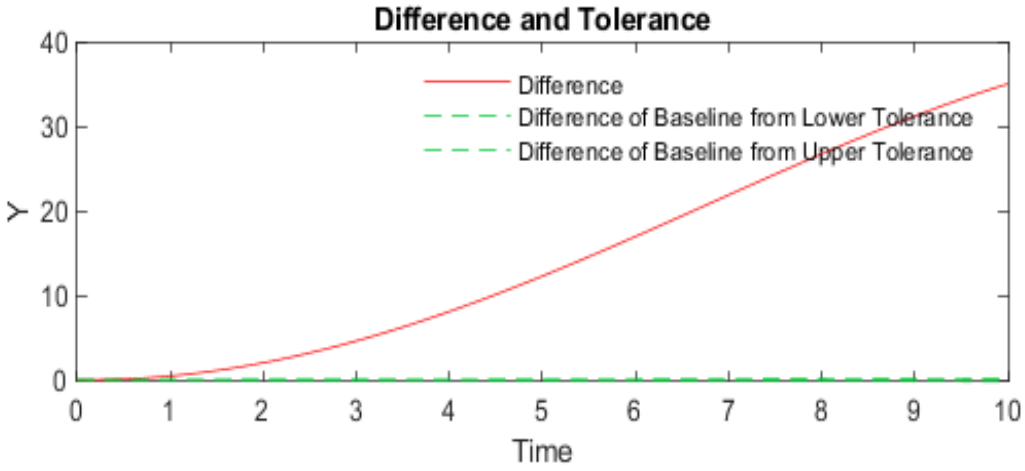
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	35	double		Continuous	double		0.001	linear	union





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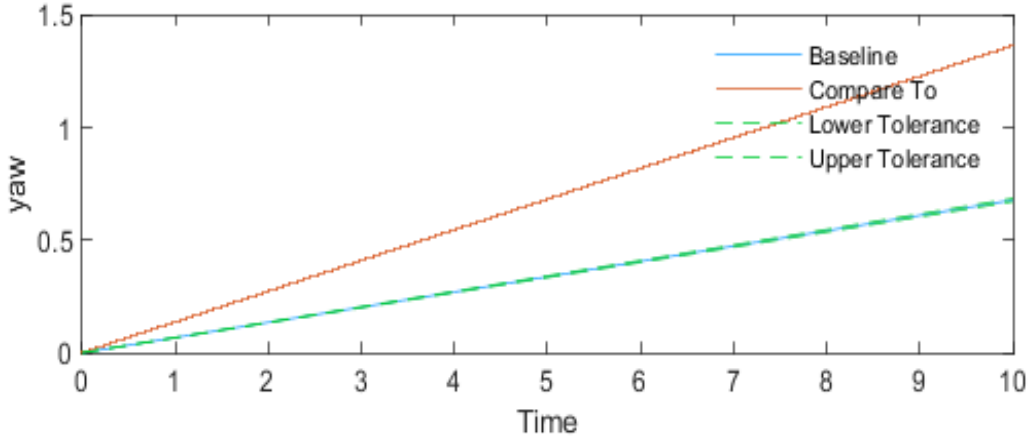
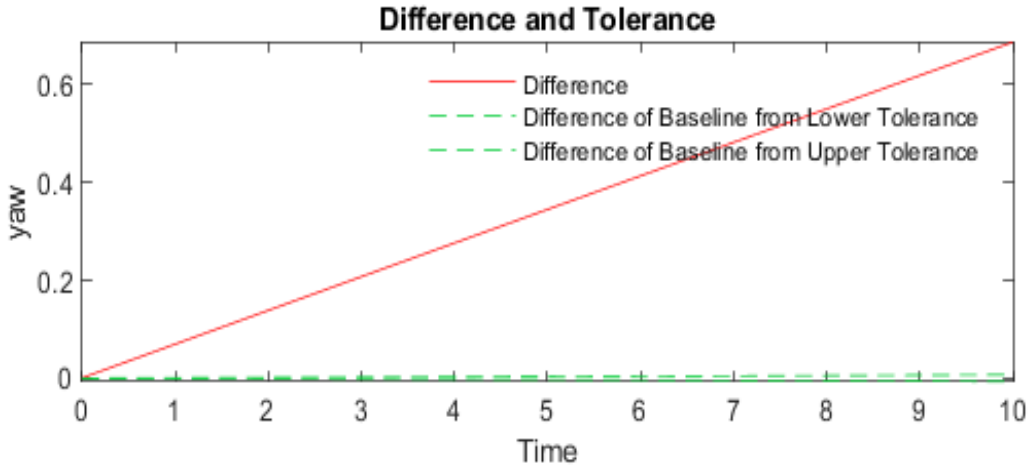
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	0.687	double		Continuous	double		0.001	linear	union





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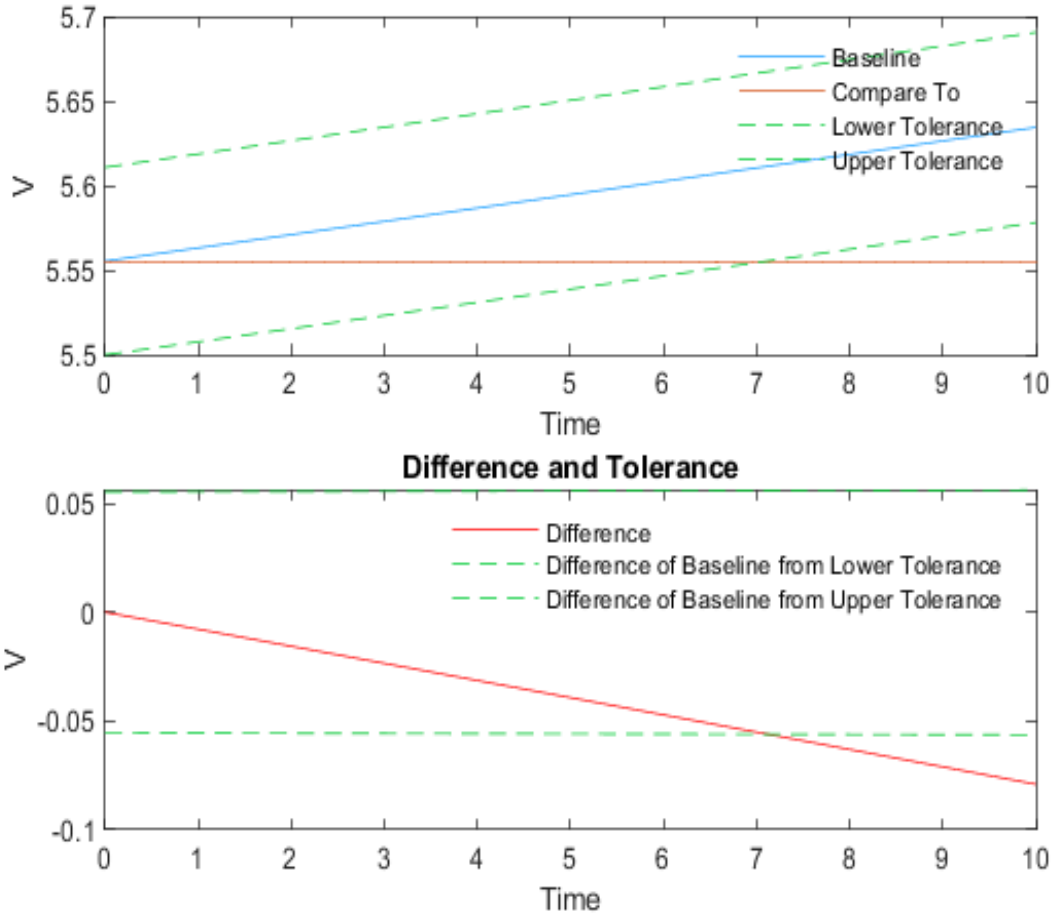
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	0.0792	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Constant_steering.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Constant_steering.mat

Input Data 2

Input Information

External Input Name: Constant_steering.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Constant_steering.mat

Simulation 1

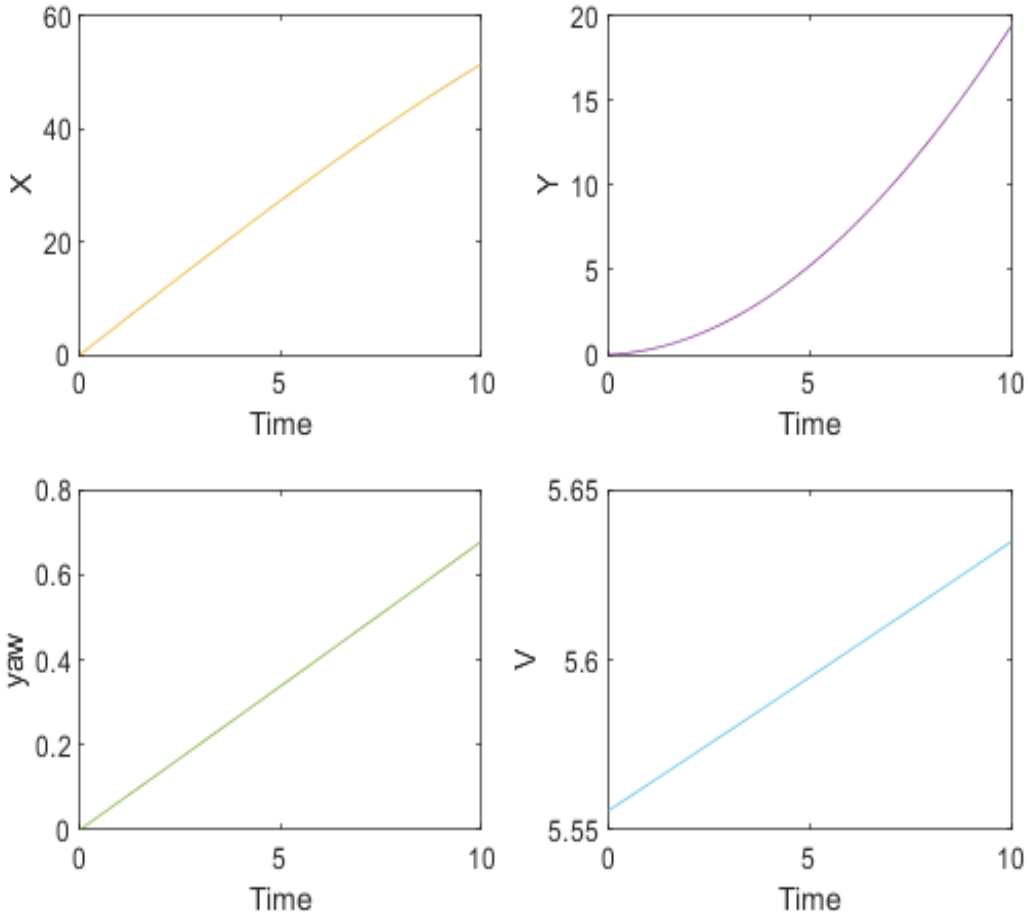
System Under Test Information

Model: Model_compare_SLX
Harness: Model_comparison_dynamic
Harness Owner: Model_compare_SLX/Dynamic_model
Simulation Mode: normal
Override SIL or PIL Mode: 0
Configuration Set: Configuration1
External Input Name: Constant_steering.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Constant_steering.mat
Start Time: 0
Stop Time: 10
Checksum: 1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

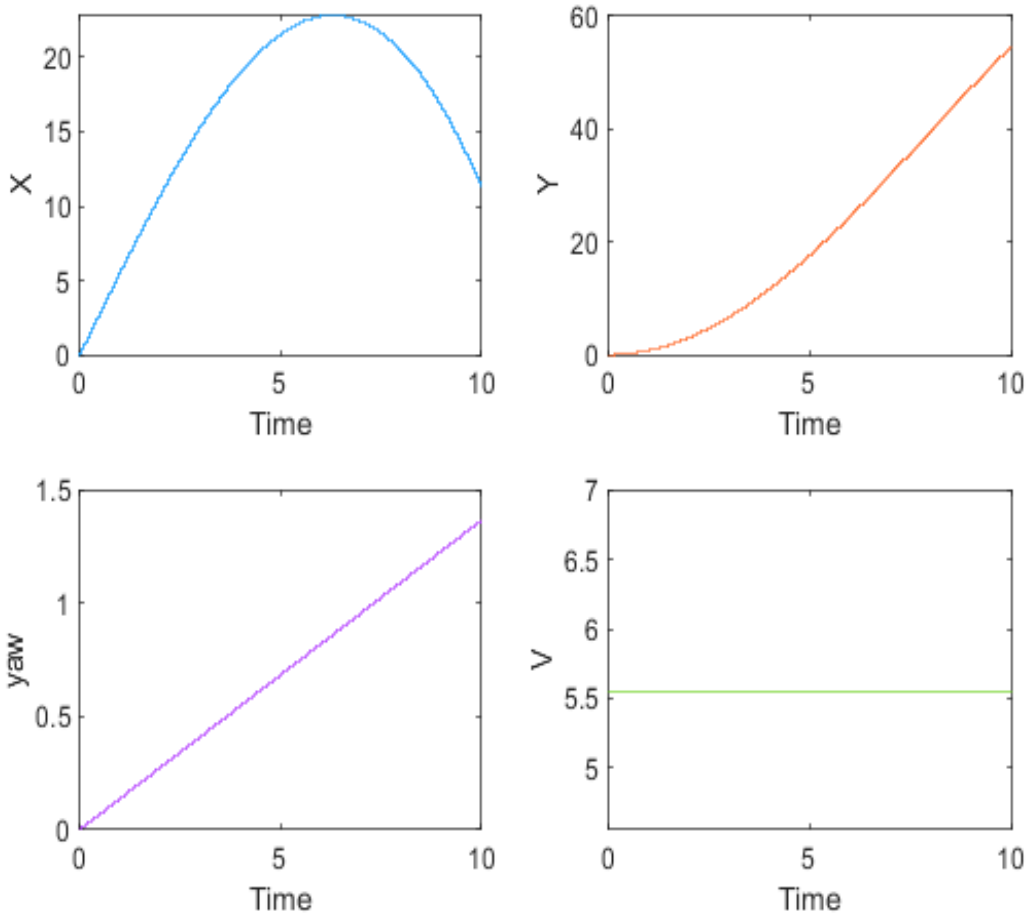
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Constant_steering.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Constant_steering.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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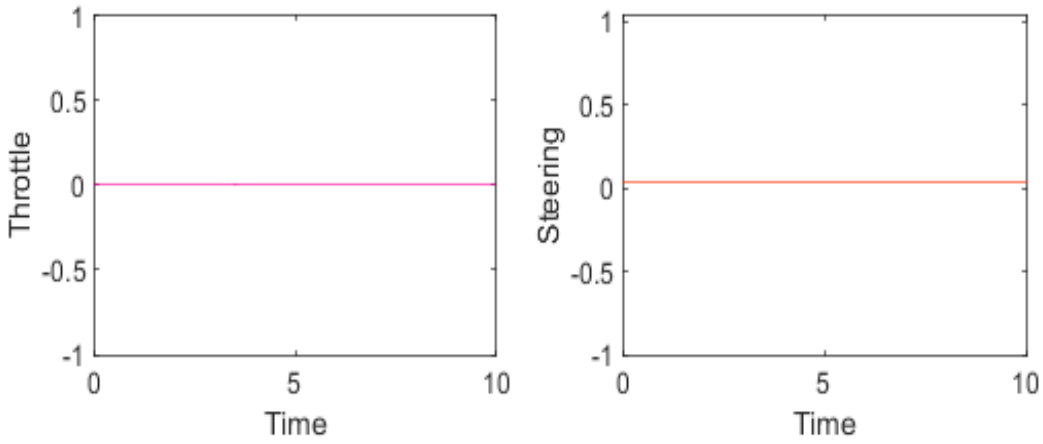
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Ramp steering

Test Result Information

Result Type: Test Iteration Result
Parent: Comparison Tests
Start Time: 19-Apr-2021 11:10:45

End Time: 19-Apr-2021 11:10:53
Outcome: Failed
Cause of Failure: Failed criteria: Equivalence
Description:

Ramp steering

Test performed keeping the throttle equal to 0 and giving a ramp steering angle signal (from 0° to 36°)

Test Case Information

Name: Ramp steering
Type: Equivalence Test

Iteration Settings

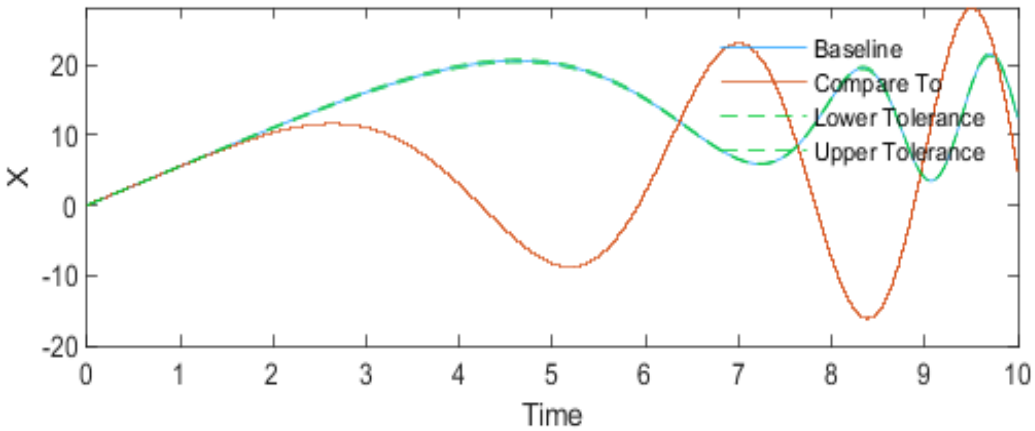
Test Overrides

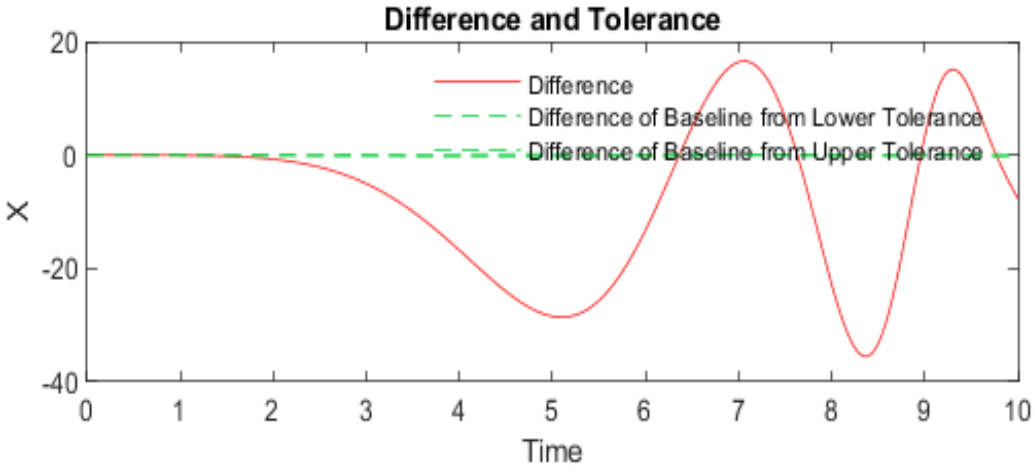
Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Ramp_steering.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Ramp_steering.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	35.6	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	36.7	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	2.44	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	42.8	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	35.6	double		Continuous	double		0.001	linear	union





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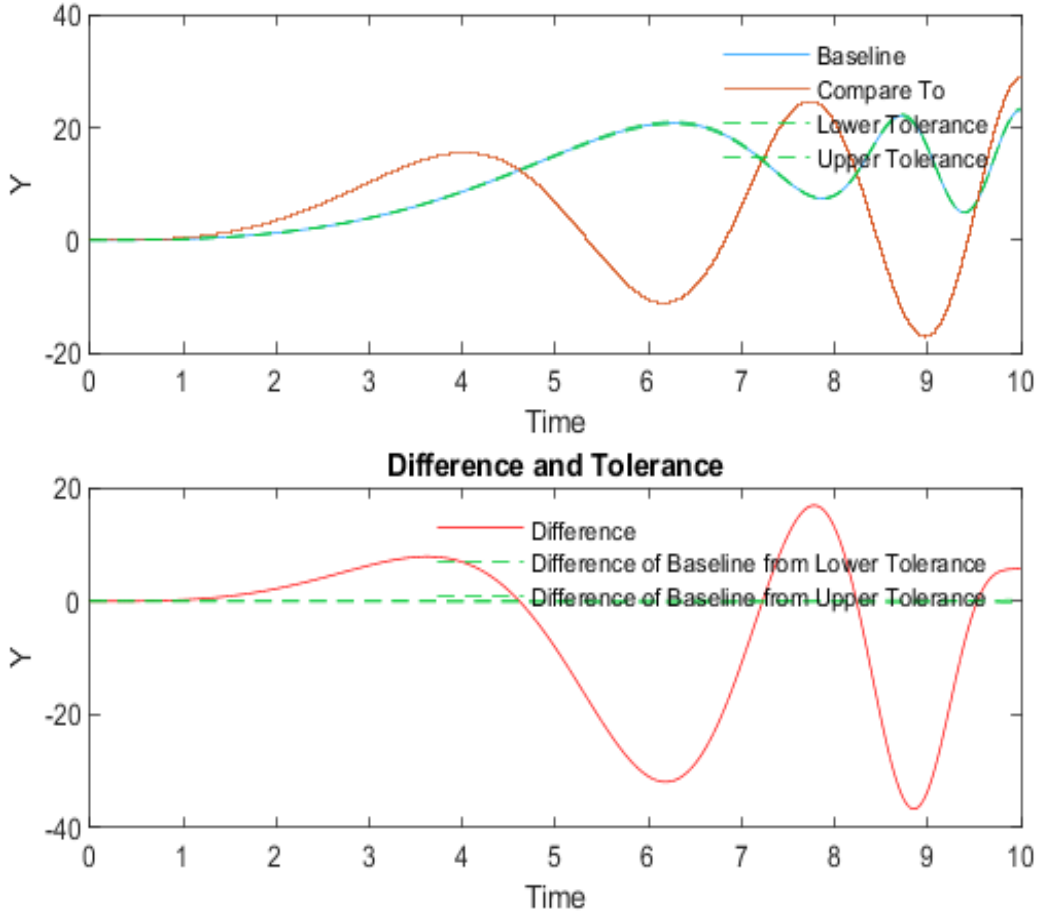
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	36.7	double		Continuous	double		0.001	linear	union



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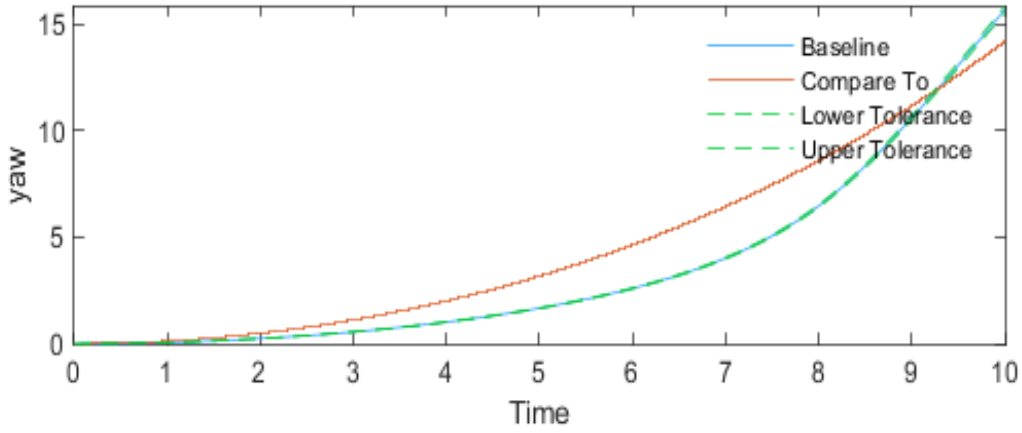
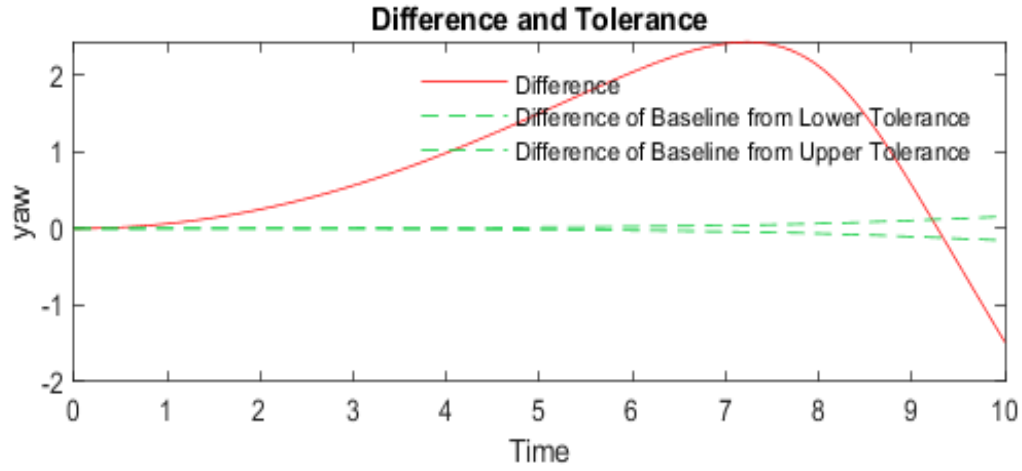
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	2.44	double		Continuous	double		0.001	linear	union





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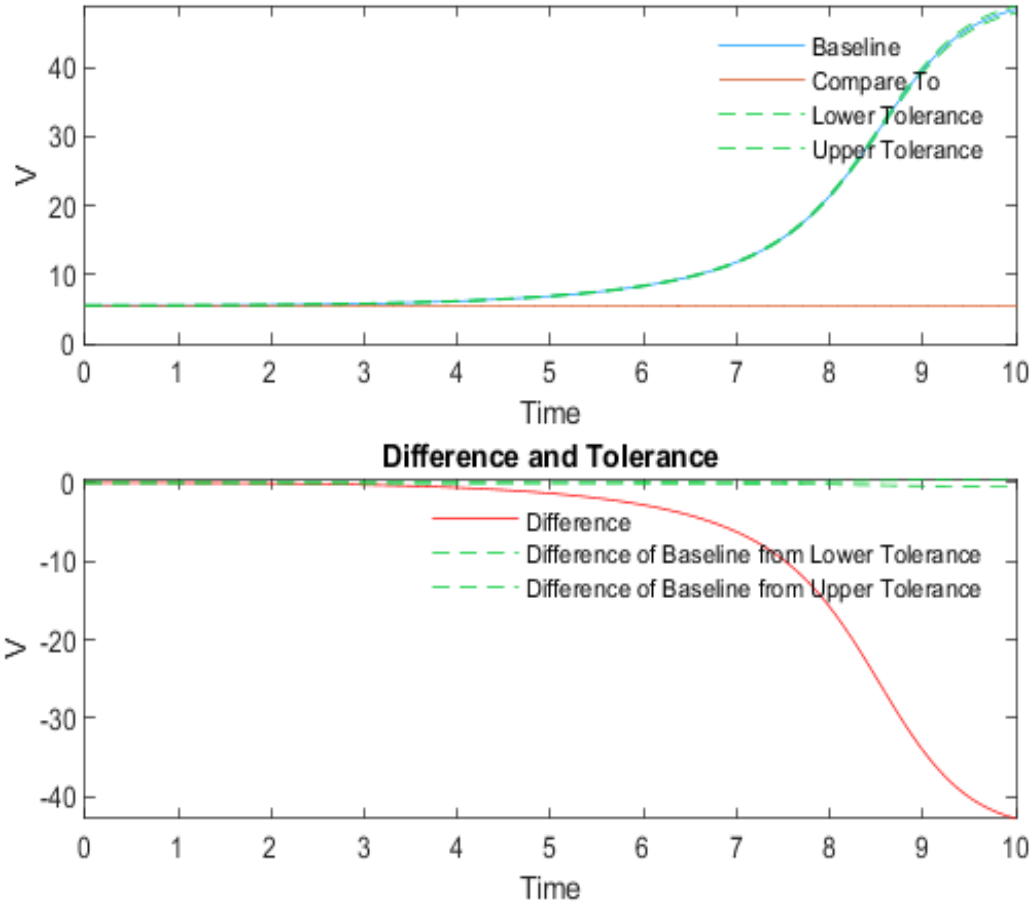
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	42.8	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Ramp_steering.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Ramp_steering.mat

Input Data 2

Input Information

External Input Name:	Ramp_steering.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Ramp_steering.mat

Simulation 1

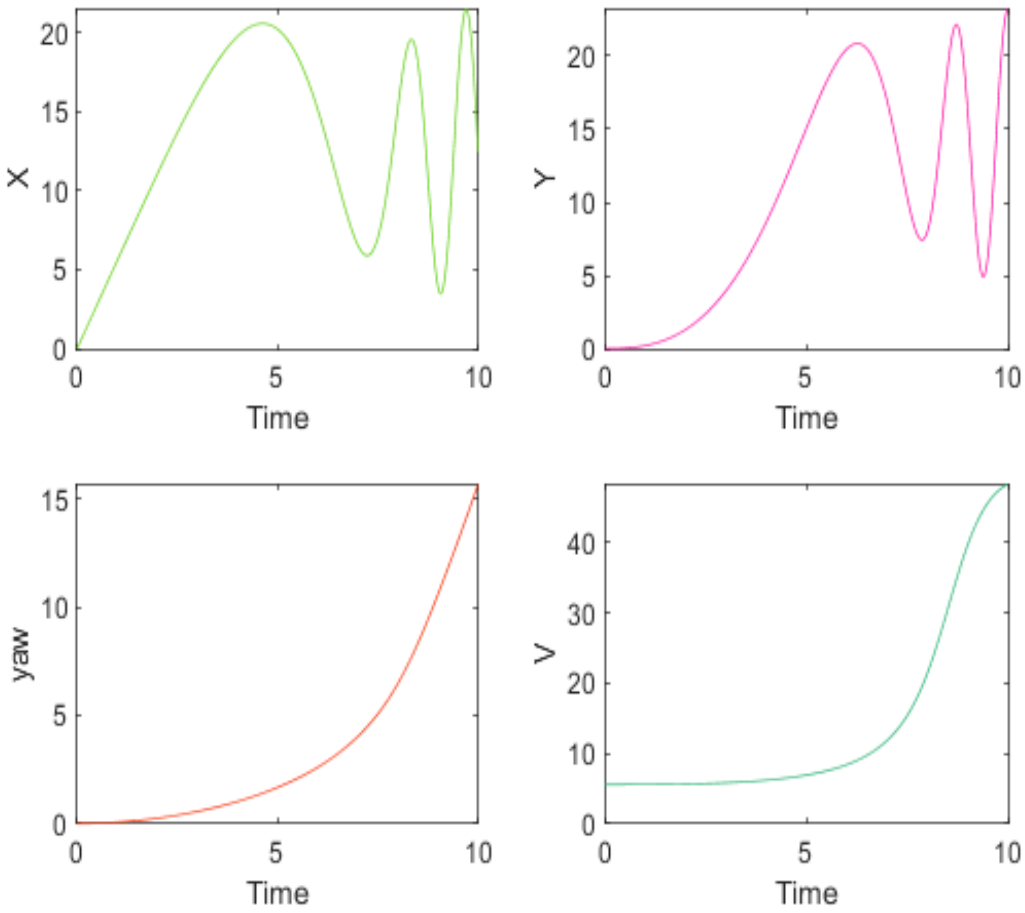
System Under Test Information

Model:	Model_compare_SLX
Harness:	Model_comparison_dynamic
Harness Owner:	Model_compare_SLX/Dynamic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Ramp_steering.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Ramp_steering.mat
Start Time:	0
Stop Time:	10
Checksum:	1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

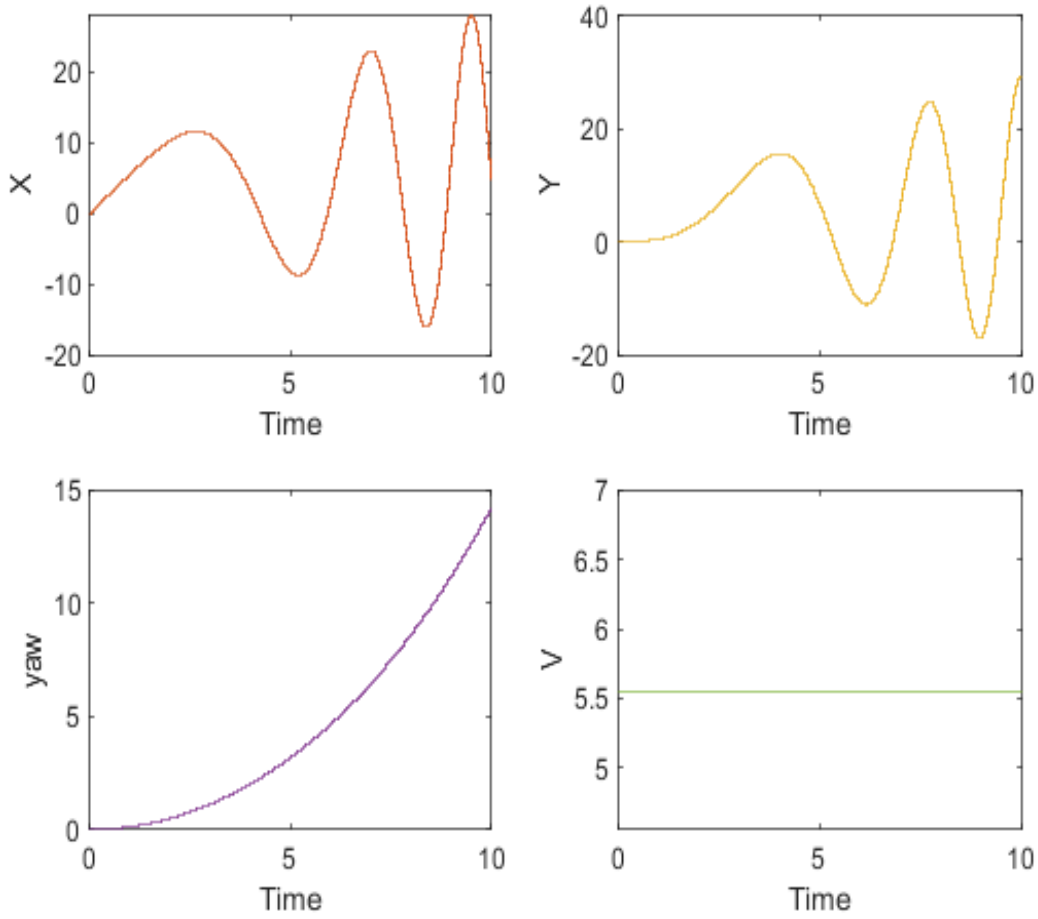
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Ramp_steering.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Ramp_steering.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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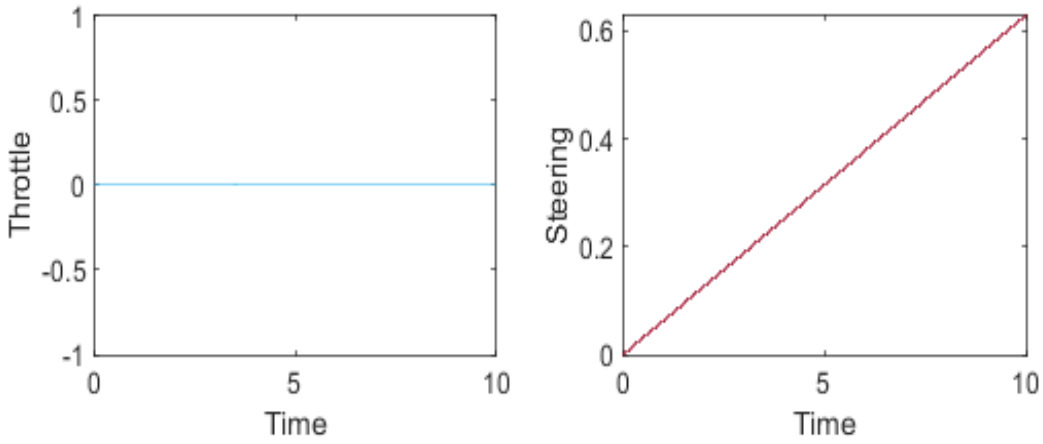
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Small sinusoidal steering

Test Result Information

Result Type: Test Iteration Result
Parent: Comparison Tests
Start Time: 19-Apr-2021 11:10:53

End Time: 19-Apr-2021 11:10:57
Outcome: Failed
Cause of Failure: Failed criteria: Equivalence
Description:

Small sinusoidal steering Test performed keeping the throttle equal to 0 and giving a sinusoidal steering angle signal with frequency 0.2Hz and amplitude 5°

Test Case Information

Name: Small sinusoidal steering
Type: Equivalence Test

Iteration Settings

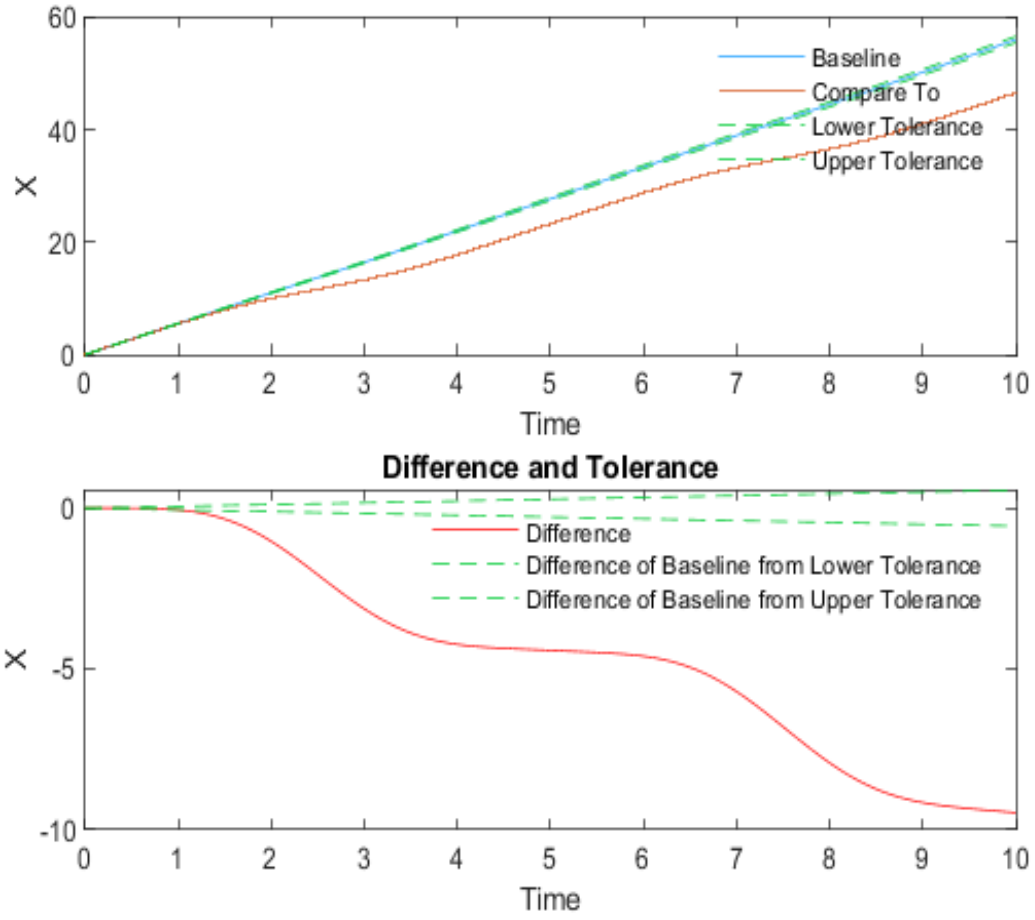
Test Overrides

Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Small_sinusoidal_steering.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Small_sinusoidal_steering.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	9.48	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	20.9	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	0.275	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	0.256	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	9.48	double		Continuous	double		0.001	linear	union



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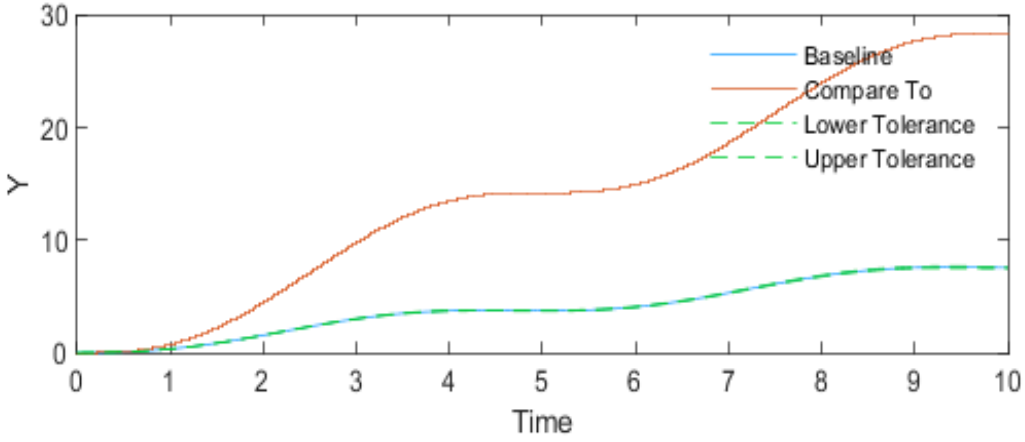
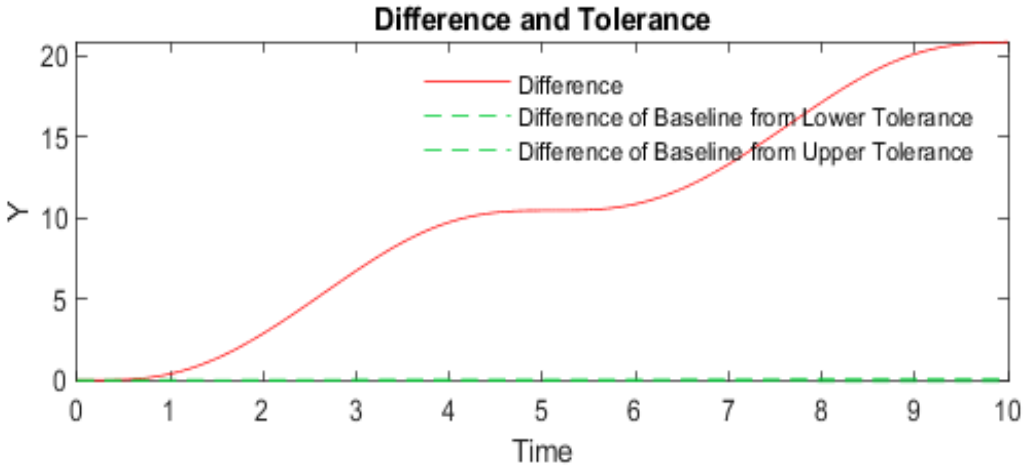
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	20.9	double		Continuous	double		0.001	linear	union





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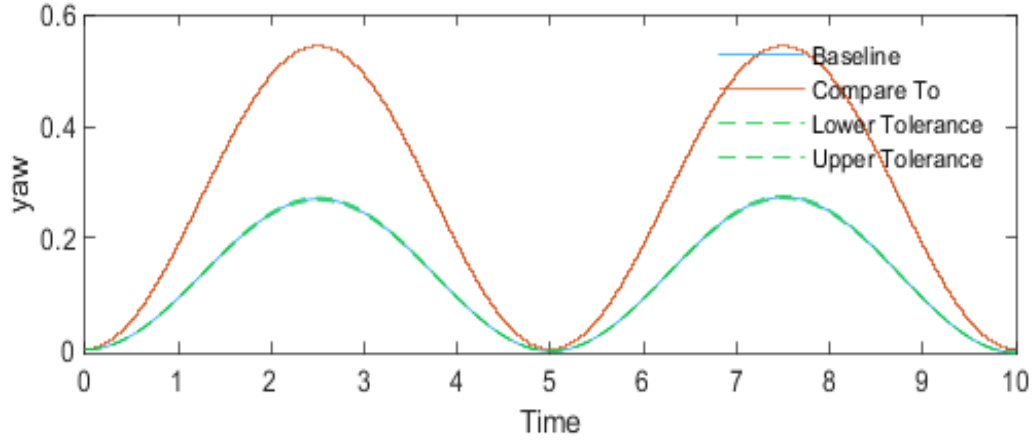
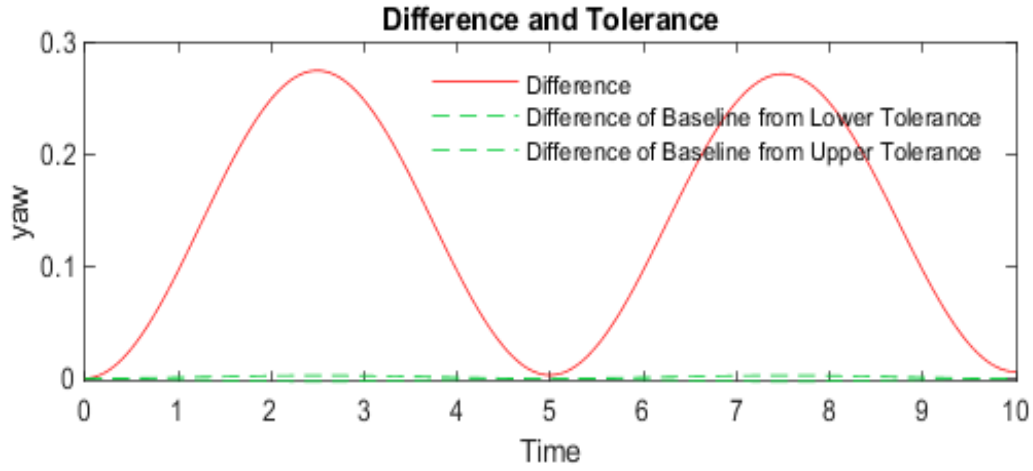
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	0.275	double		Continuous	double		0.001	linear	union





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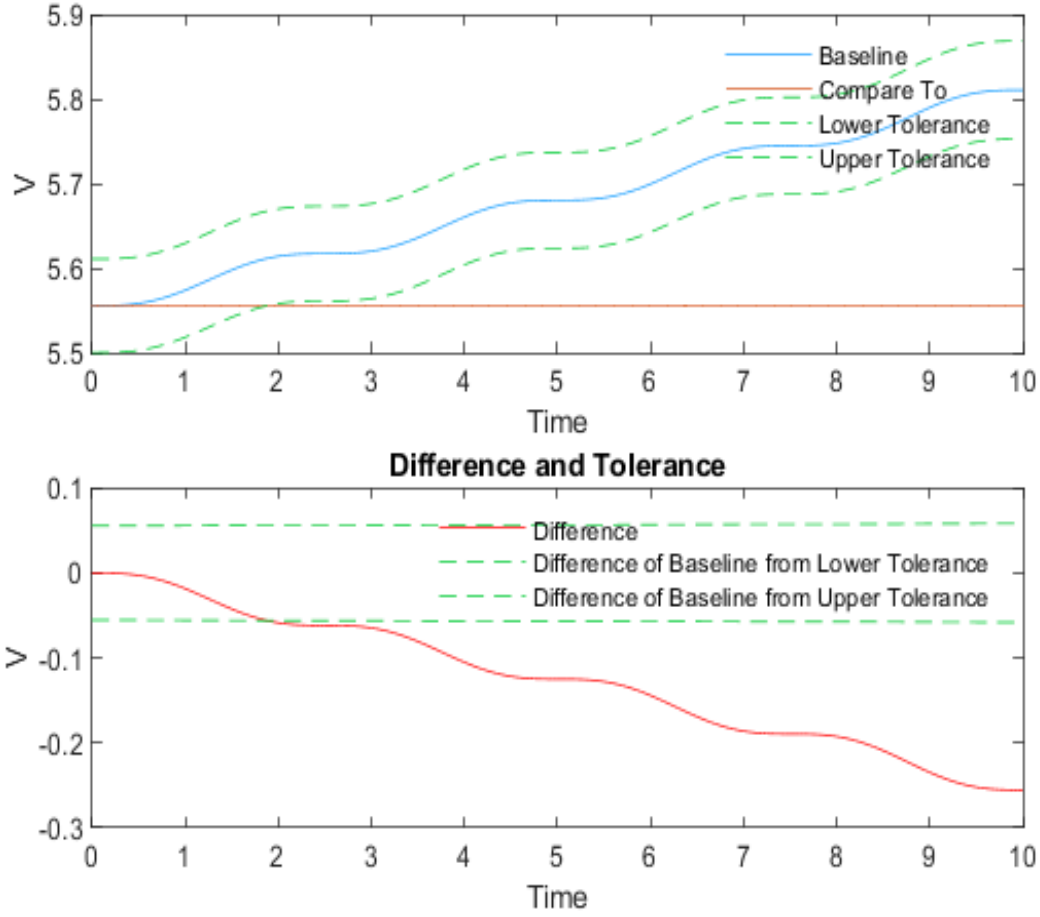
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	0.256	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Small_sinusoidal_steering.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Small_sinusoidal_steering.mat

Input Data 2

Input Information

External Input Name: Small_sinusoidal_steering.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Small_sinusoidal_steering.mat

Simulation 1

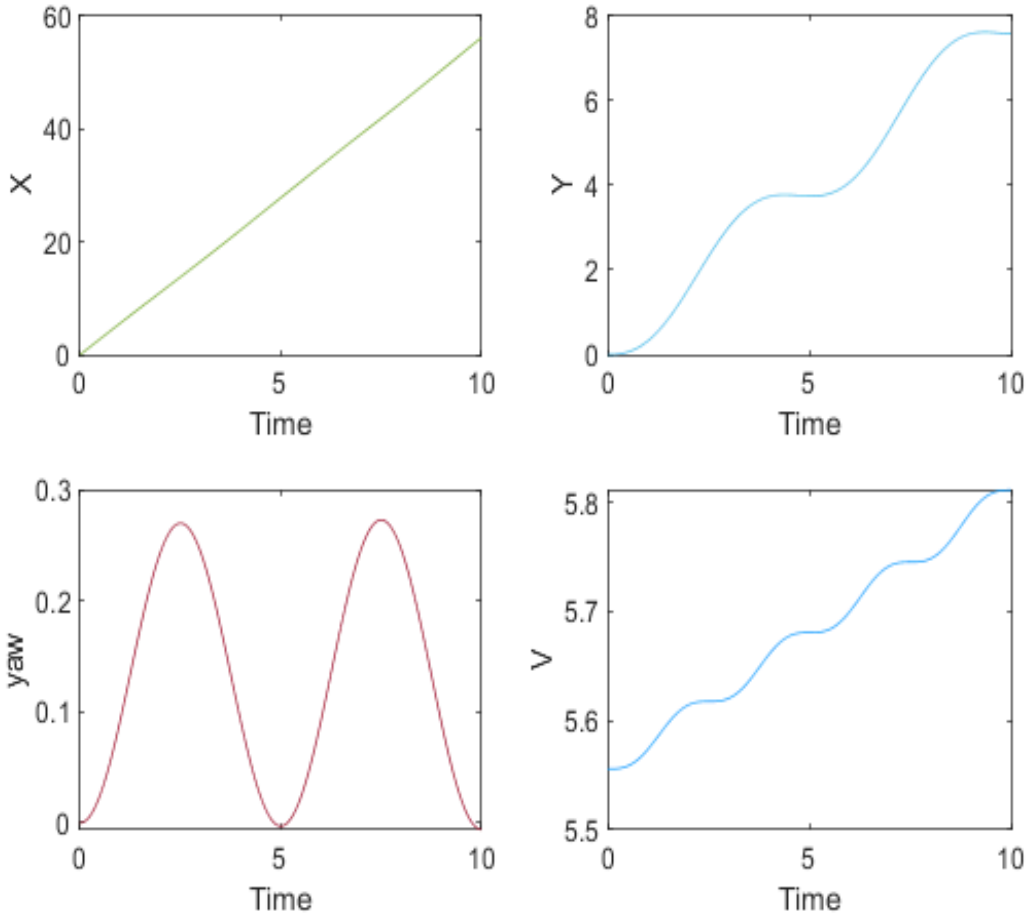
System Under Test Information

Model: Model_compare_SLX
Harness: Model_comparison_dynamic
Harness Owner: Model_compare_SLX/Dynamic_model
Simulation Mode: normal
Override SIL or PIL Mode: 0
Configuration Set: Configuration1
External Input Name: Small_sinusoidal_steering.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Small_sinusoidal_steering.mat
Start Time: 0
Stop Time: 10
Checksum: 1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

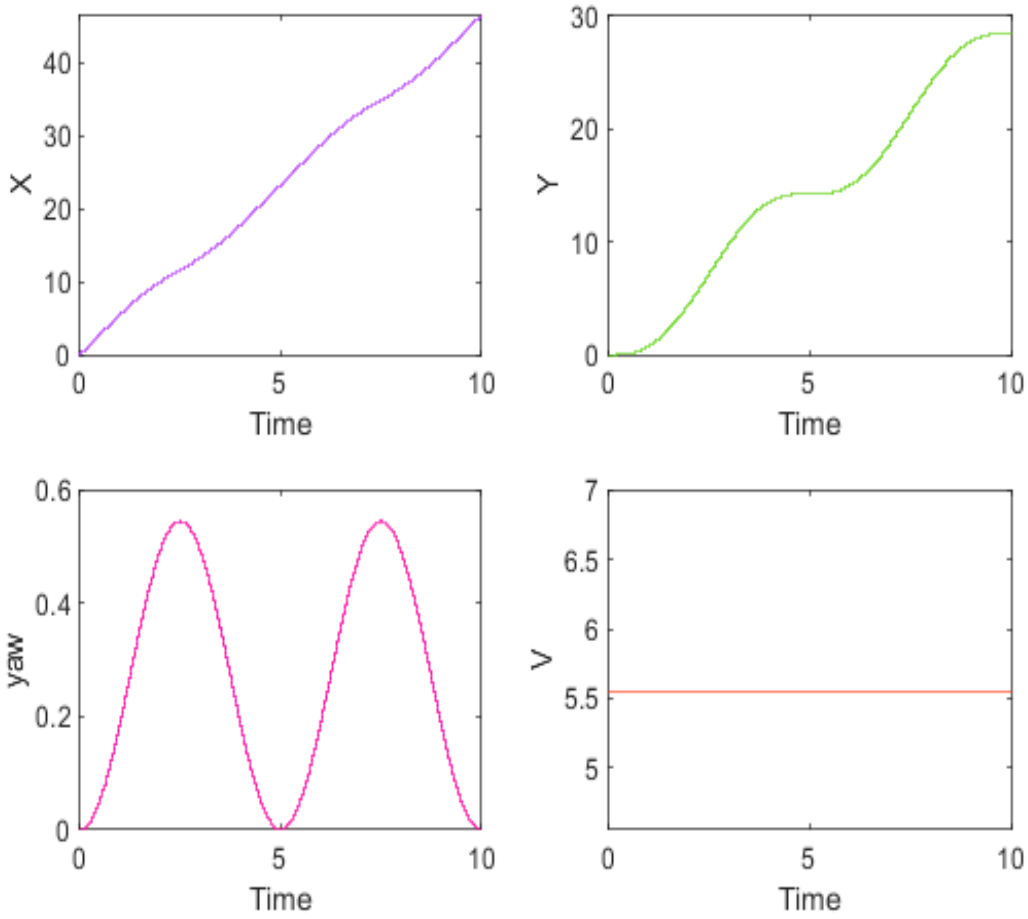
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Small_sinusoidal_steering.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Small_sinusoidal_steering.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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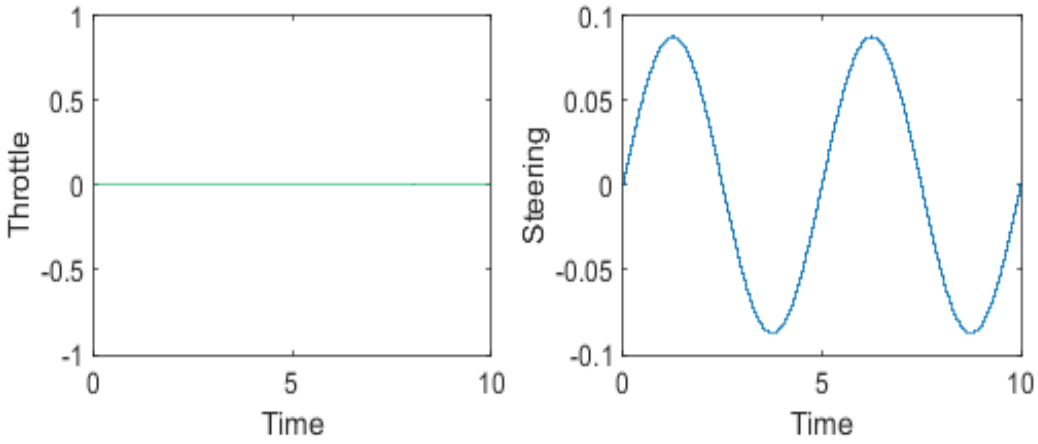
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Big sinusoidal steering

Test Result Information

Result Type:	Test Iteration Result
Parent:	Comparison Tests
Start Time:	19-Apr-2021 11:10:58

End Time: 19-Apr-2021 11:11:01
Outcome: Failed
Cause of Failure: Failed criteria: Equivalence
Description:

Big sinusoidal steering Test performed keeping the throttle equal to 0 and giving a sinusoidal steering angle signal with frequency 0.2Hz and amplitude 15°

Test Case Information

Name: Big sinusoidal steering
Type: Equivalence Test

Iteration Settings

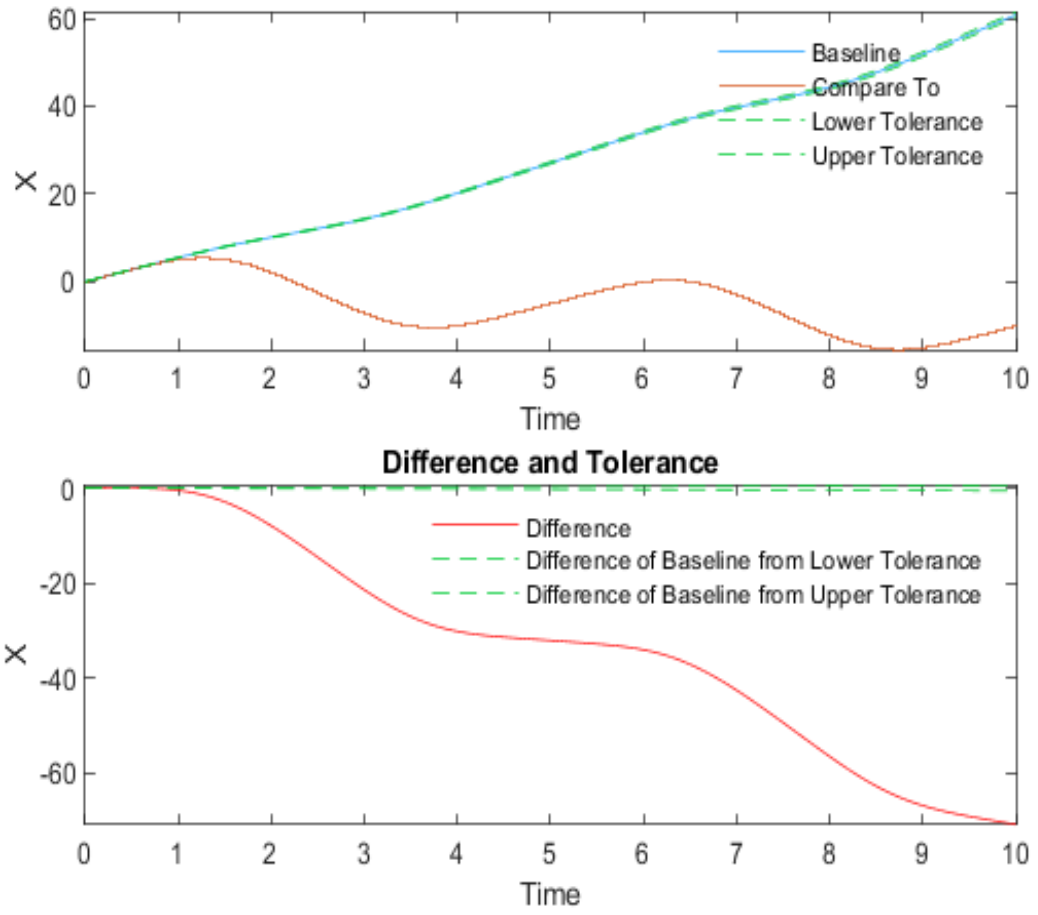
Test Overrides

Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Big_sinusoidal_steering.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Big_sinusoidal_steering.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	70.9	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	21.4	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	0.82	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	3.68	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	70.9	double		Continuous	double		0.001	linear	union



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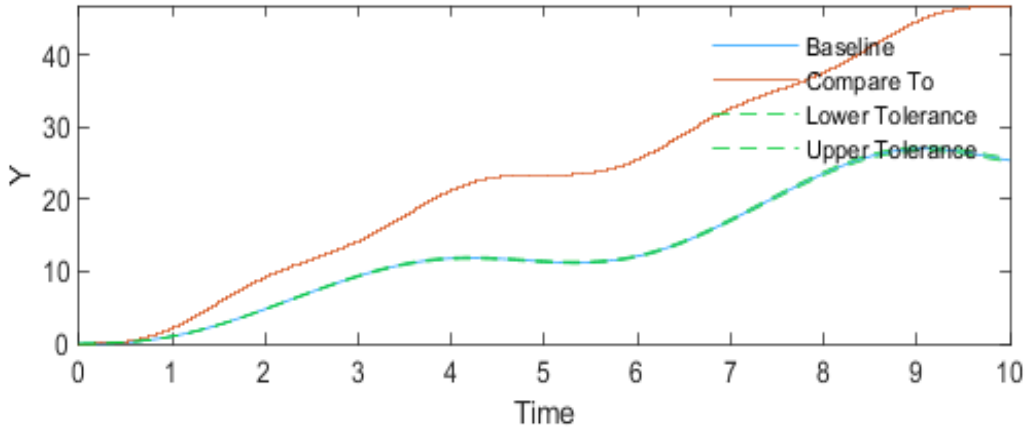
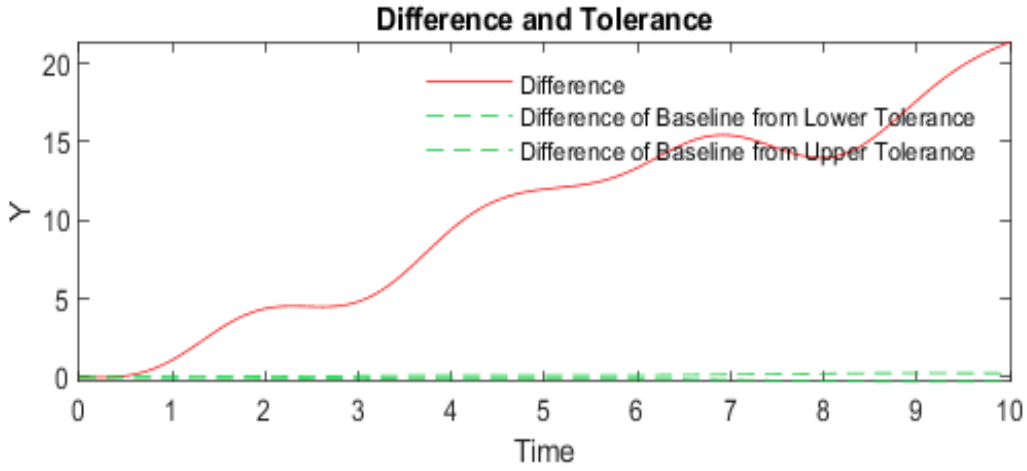
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	21.4	double		Continuous	double		0.001	linear	union





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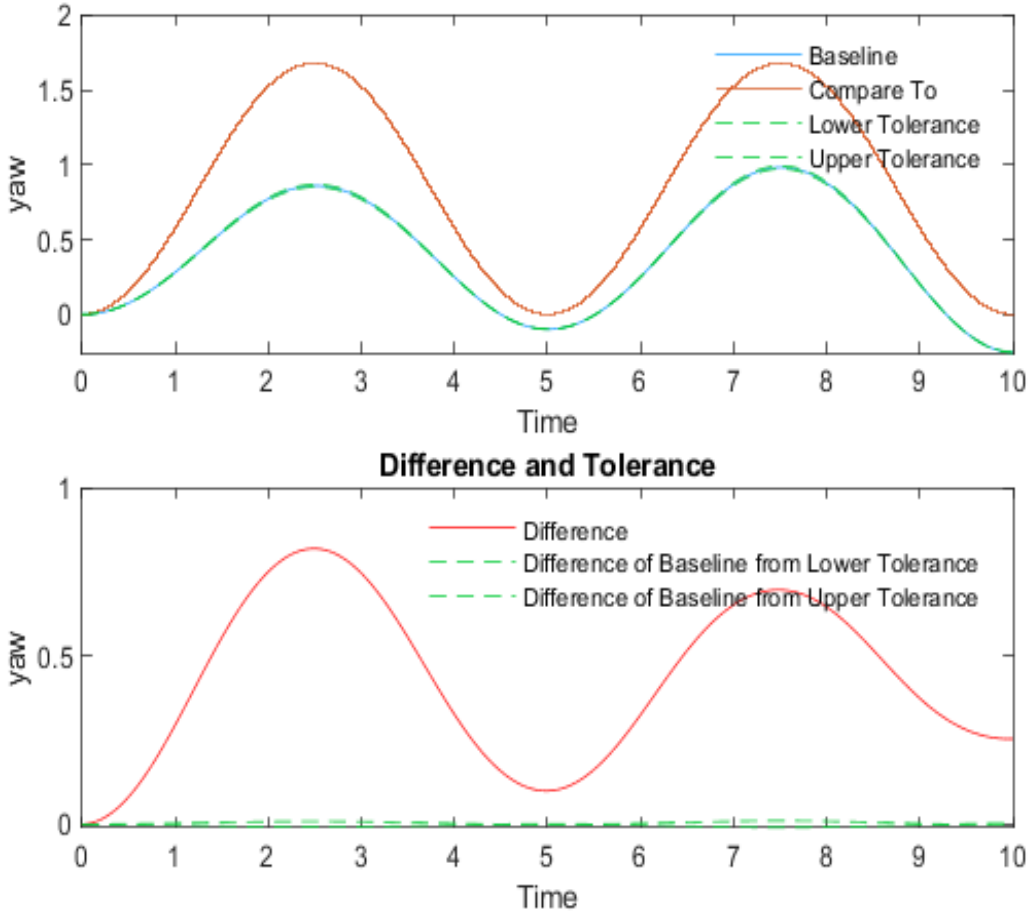
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	0.82	double		Continuous	double		0.001	linear	union



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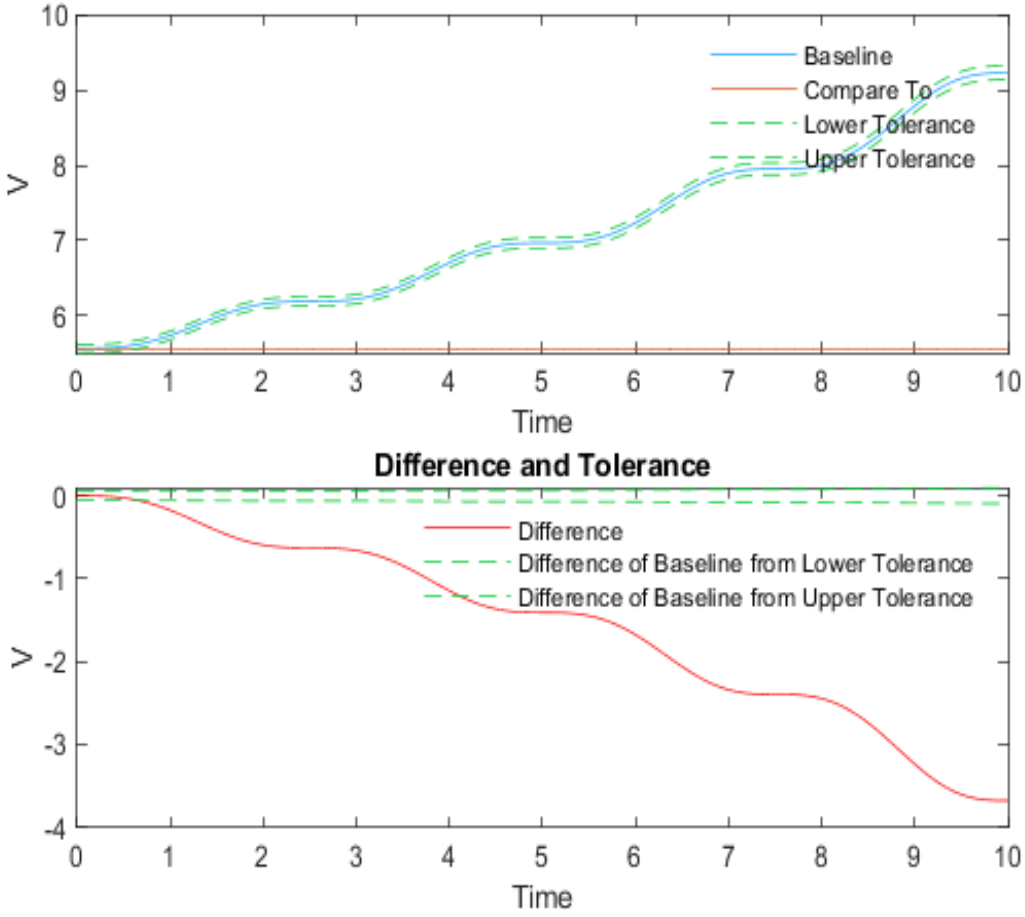
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	3.68	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Big_sinusoidal_steering.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Big_sinusoidal_steering.mat

Input Data 2

Input Information

External Input Name: Big_sinusoidal_steering.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Big_sinusoidal_steering.mat

Simulation 1

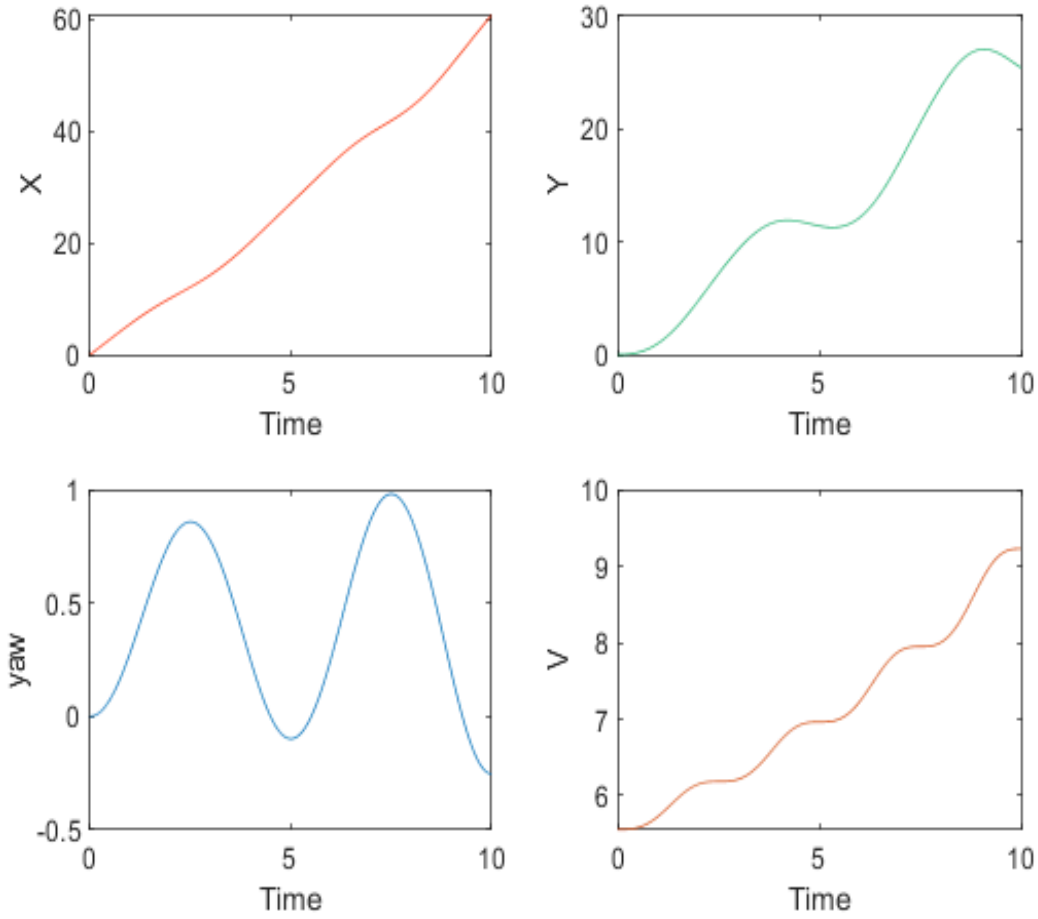
System Under Test Information

Model: Model_compare_SLX
Harness: Model_comparison_dynamic
Harness Owner: Model_compare_SLX/Dynamic_model
Simulation Mode: normal
Override SIL or PIL Mode: 0
Configuration Set: Configuration1
External Input Name: Big_sinusoidal_steering.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Big_sinusoidal_steering.mat
Start Time: 0
Stop Time: 10
Checksum: 1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

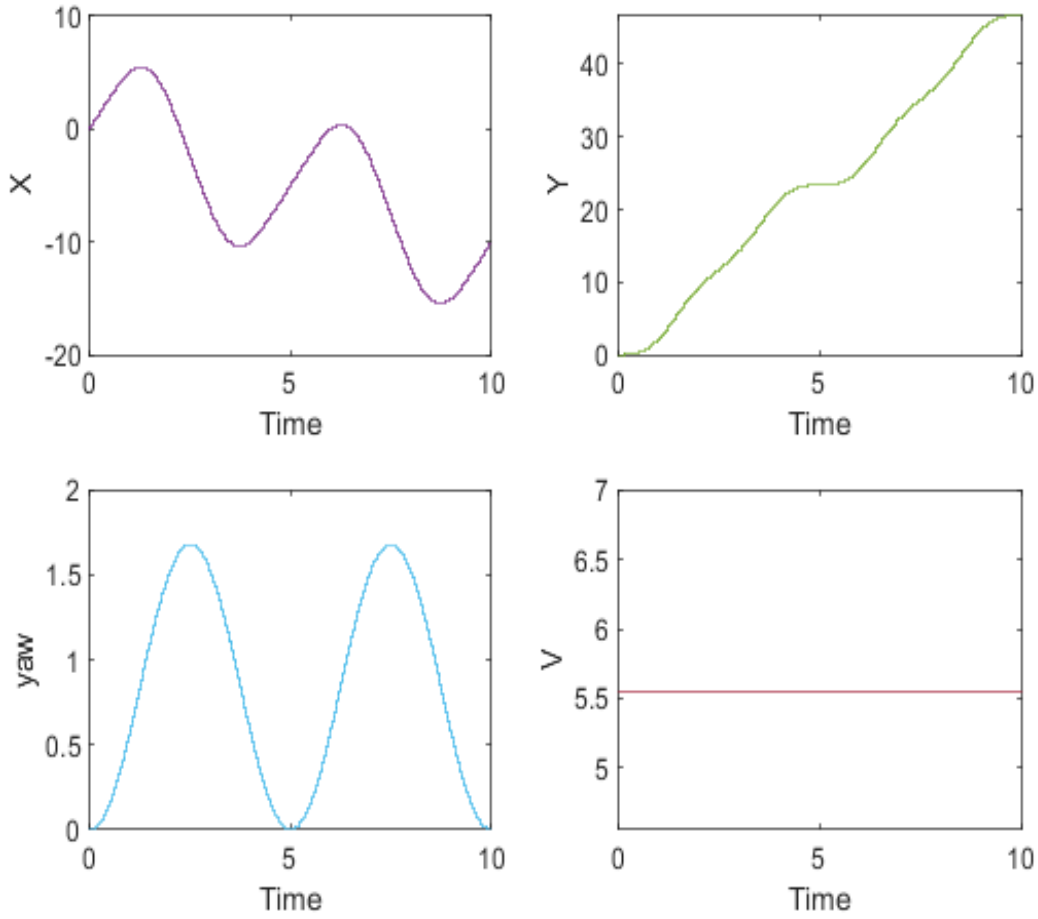
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Big_sinusoidal_steering.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Big_sinusoidal_steering.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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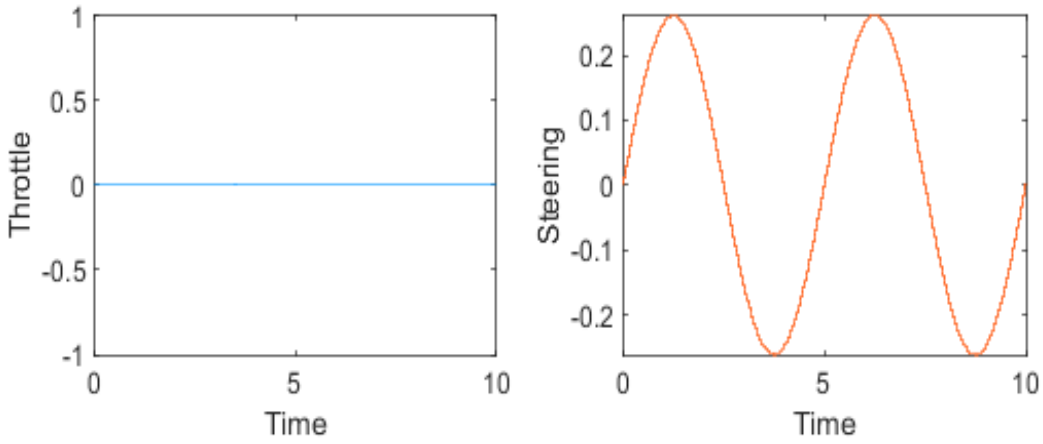
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Combined 1

Test Result Information

Result Type: Test Iteration Result
Parent: Comparison Tests
Start Time: 19-Apr-2021 11:11:01

End Time: 19-Apr-2021 11:11:05
Outcome: Failed
Cause of Failure: Failed criteria: Equivalence
Description:

Combined 1

Throttle signal with a predefined shape and constant steering angle

Test Case Information

Name: Combined 1
Type: Equivalence Test

Iteration Settings

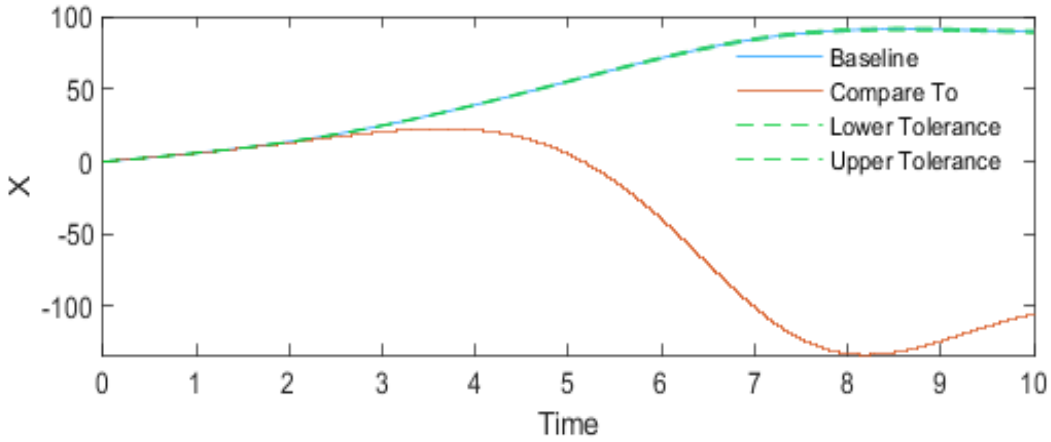
Test Overrides

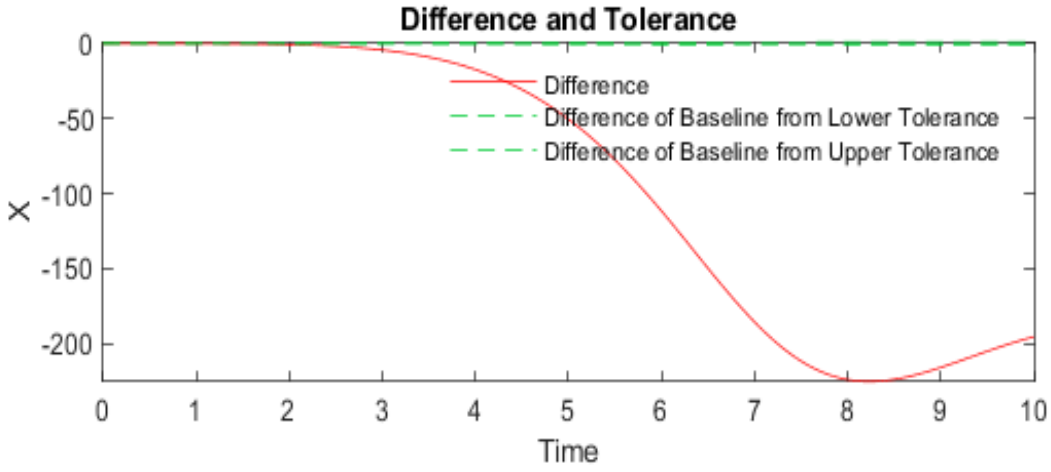
Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Combined1.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Combined1.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	225	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	240	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	2.26	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	0.505	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	225	double		Continuous	double		0.001	linear	union





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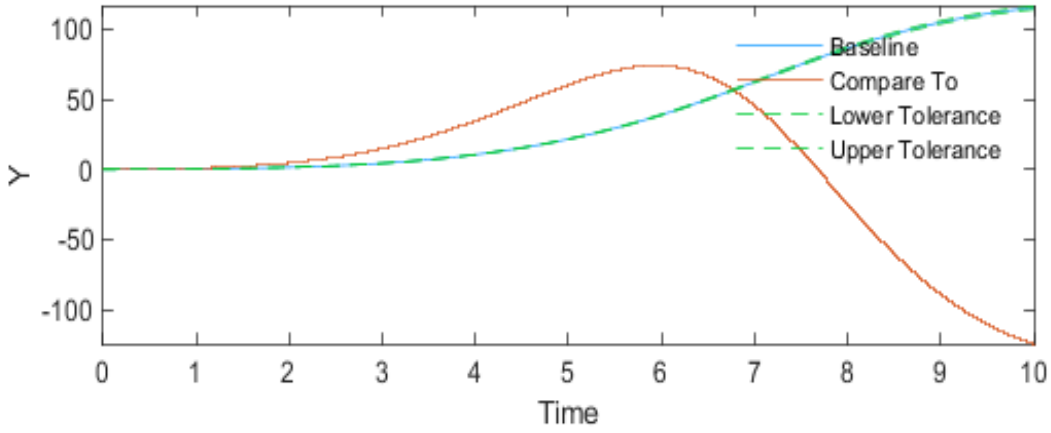
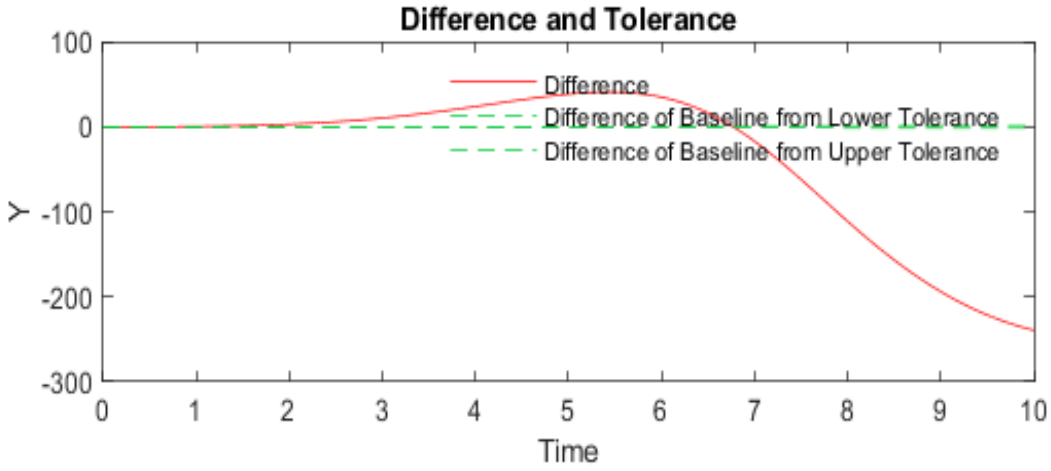
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	240	double		Continuous	double		0.001	linear	union





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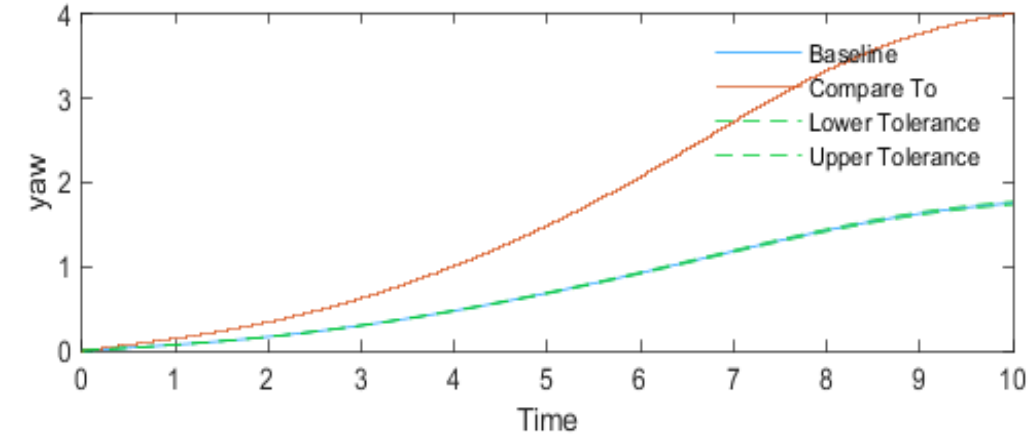
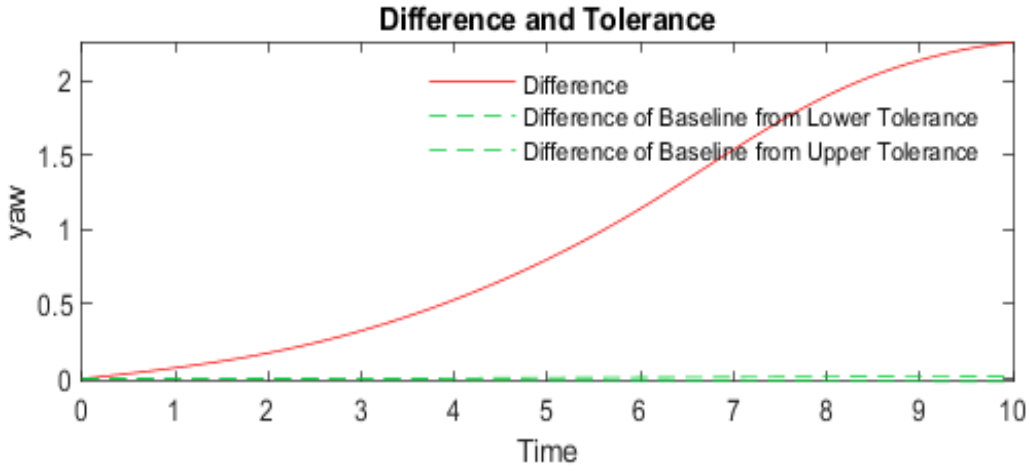
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	2.26	double		Continuous	double		0.001	linear	union





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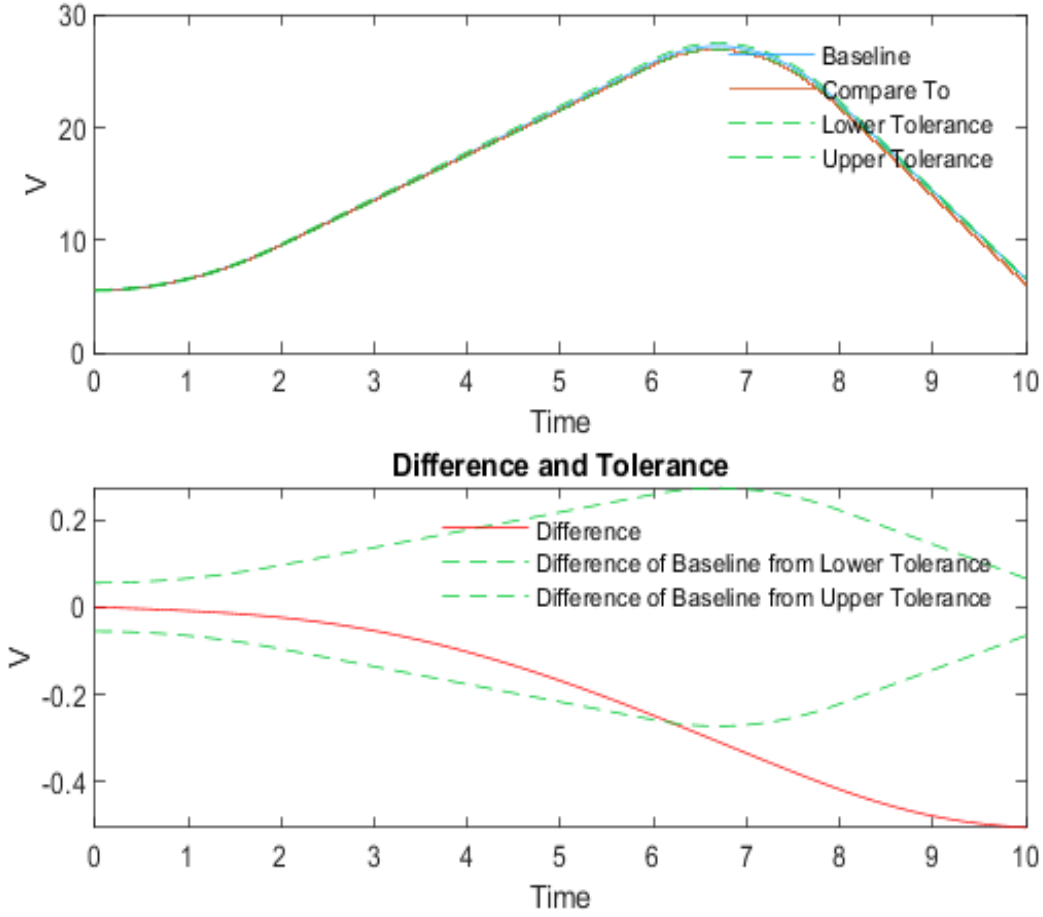
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	0.505	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Combined1.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined1.mat

Input Data 2

Input Information

External Input Name:	Combined1.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined1.mat

Simulation 1

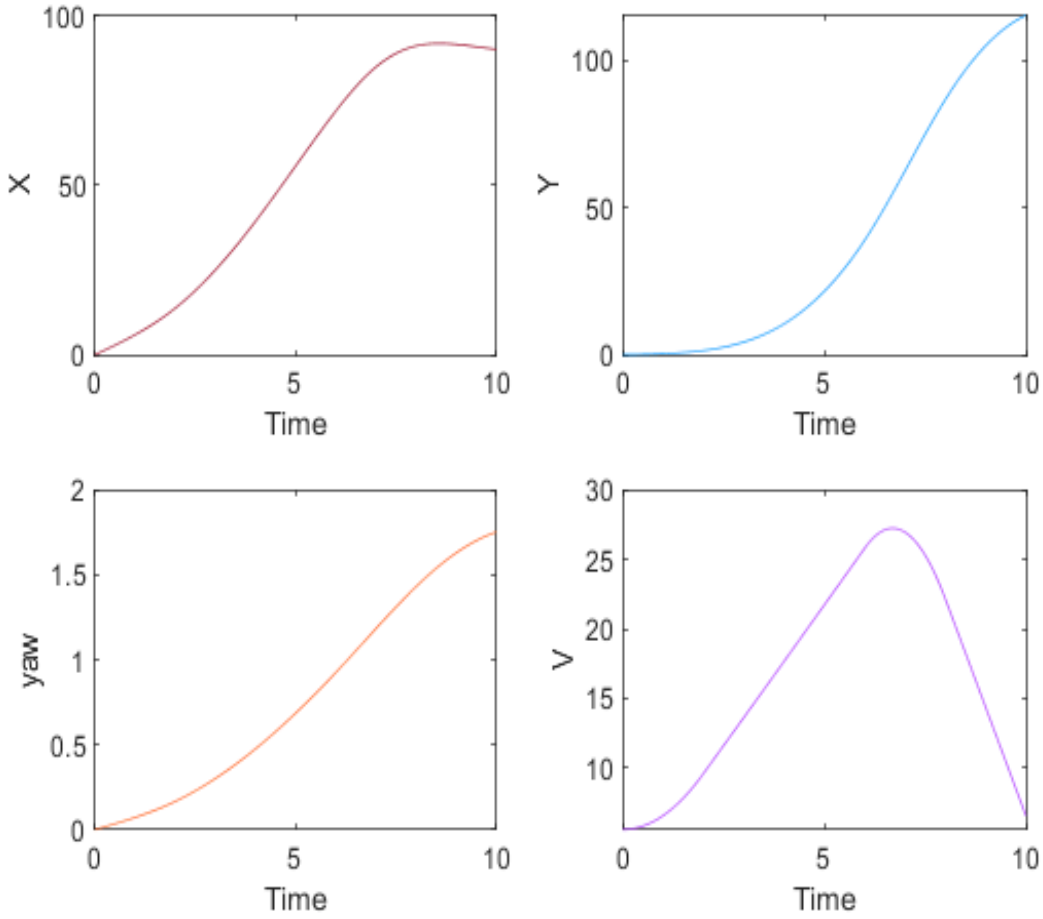
System Under Test Information

Model:	Model_compare_SLX
Harness:	Model_comparison_dynamic
Harness Owner:	Model_compare_SLX/Dynamic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Combined1.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined1.mat
Start Time:	0
Stop Time:	10
Checksum:	1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

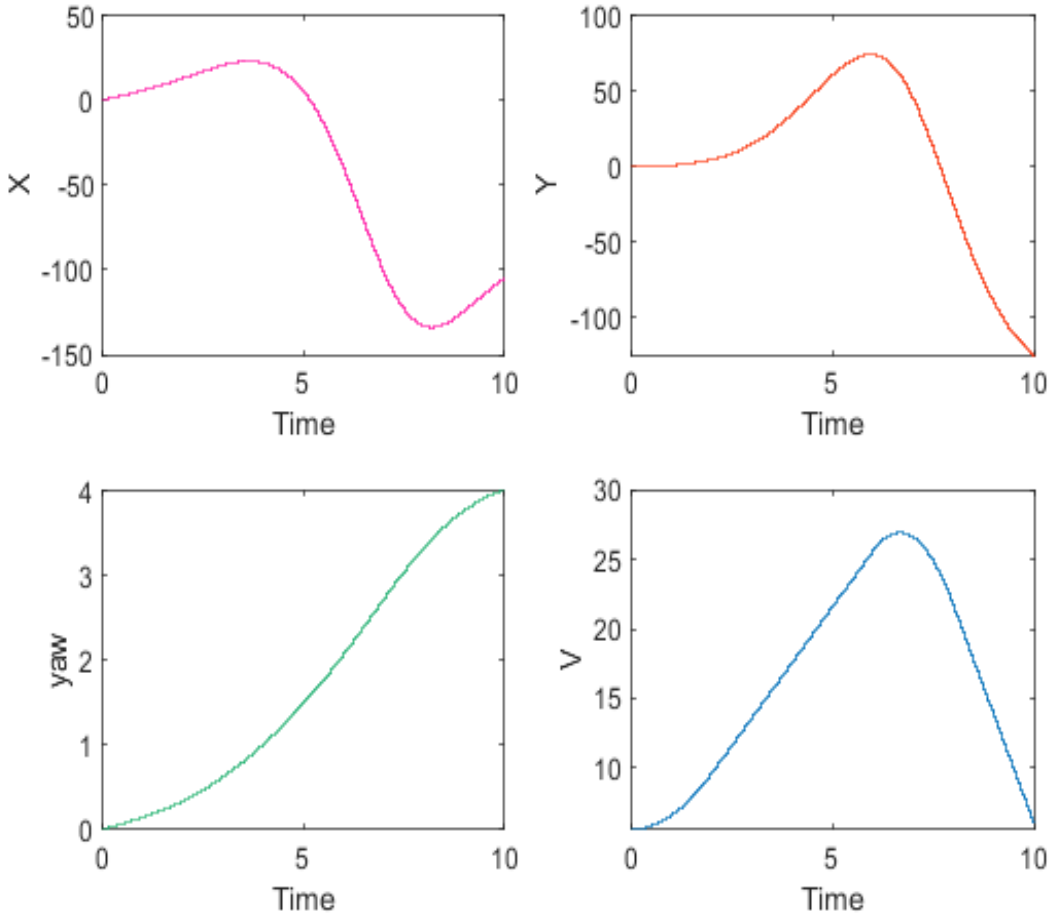
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Combined1.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined1.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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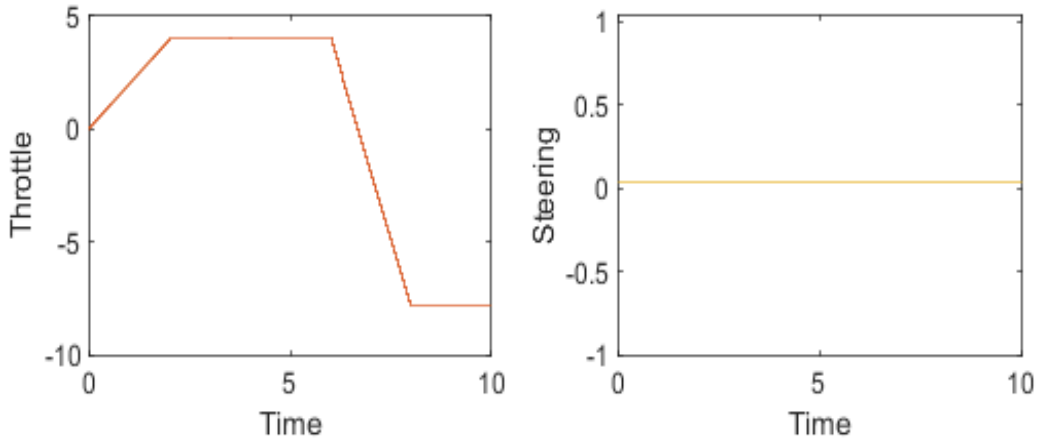
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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Combined 2

Test Result Information

Result Type: Test Iteration Result
Parent: Comparison Tests
Start Time: 19-Apr-2021 11:11:05

End Time: 19-Apr-2021 11:11:08
Outcome: Failed
Cause of Failure: Failed criteria: Equivalence
Description:

Combined 2

Ramp steering angle signal with a constant throttle

Test Case Information

Name: Combined 2
Type: Equivalence Test

Iteration Settings

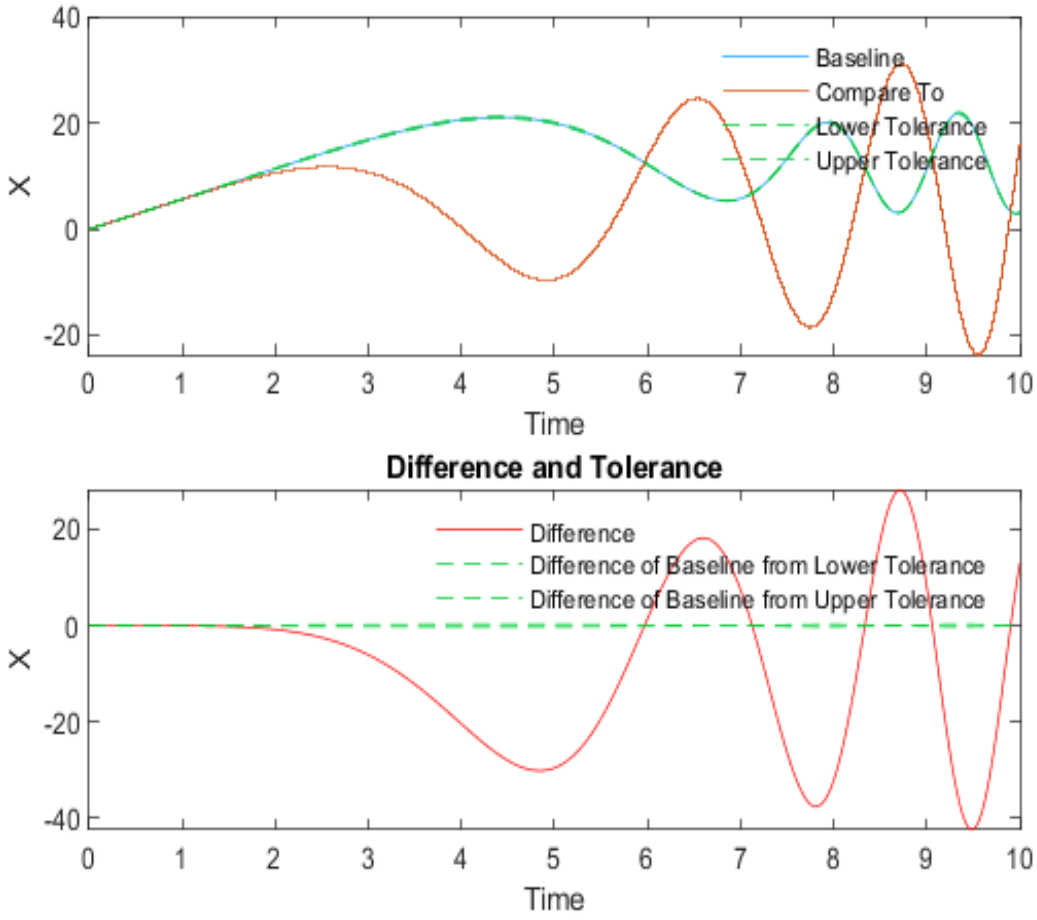
Test Overrides

Parameter Name	Value	Simulation Index
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Combined2.mat	1
ExternalInput	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\Simulink Models\Combined2.mat	2

Equivalence Comparison

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync	Link to Plot
X	0	0.01	0	0	42.3	double		Continuous	double		0.001	linear	union	Link
Y	0	0.01	0	0	43	double		Continuous	double		0.001	linear	union	Link
yaw	0	0.01	0	0	2.71	double		Continuous	double		0.001	linear	union	Link
V	0	0.01	0	0	41.8	double		Continuous	double		0.001	linear	union	Link

Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
X	0	0.01	0	0	42.3	double		Continuous	double		0.001	linear	union



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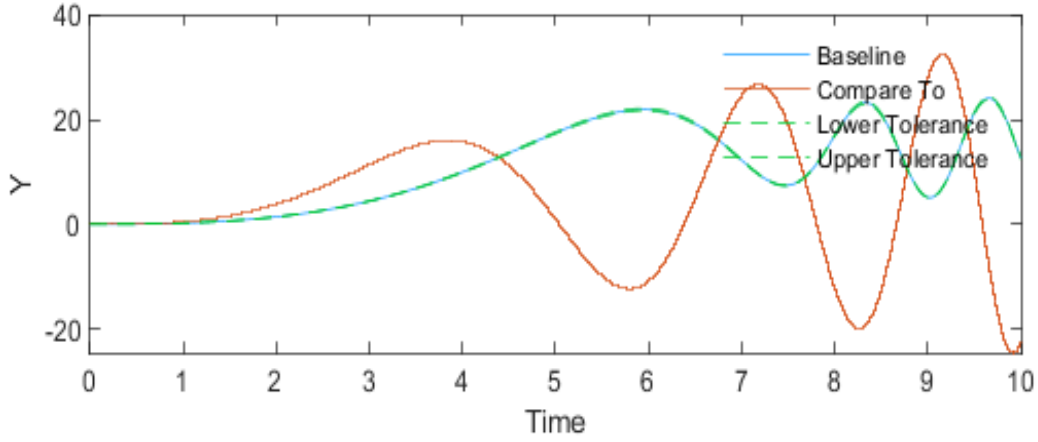
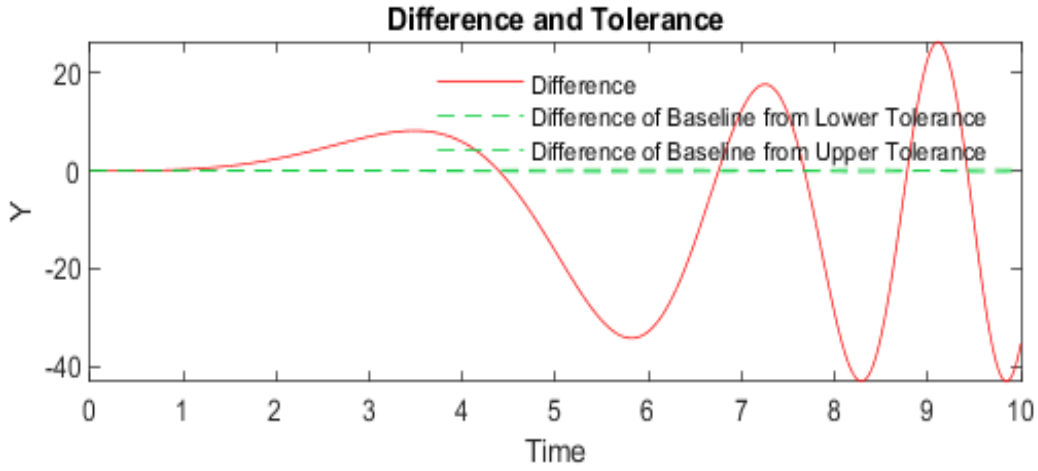
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
Y	0	0.01	0	0	43	double		Continuous	double		0.001	linear	union





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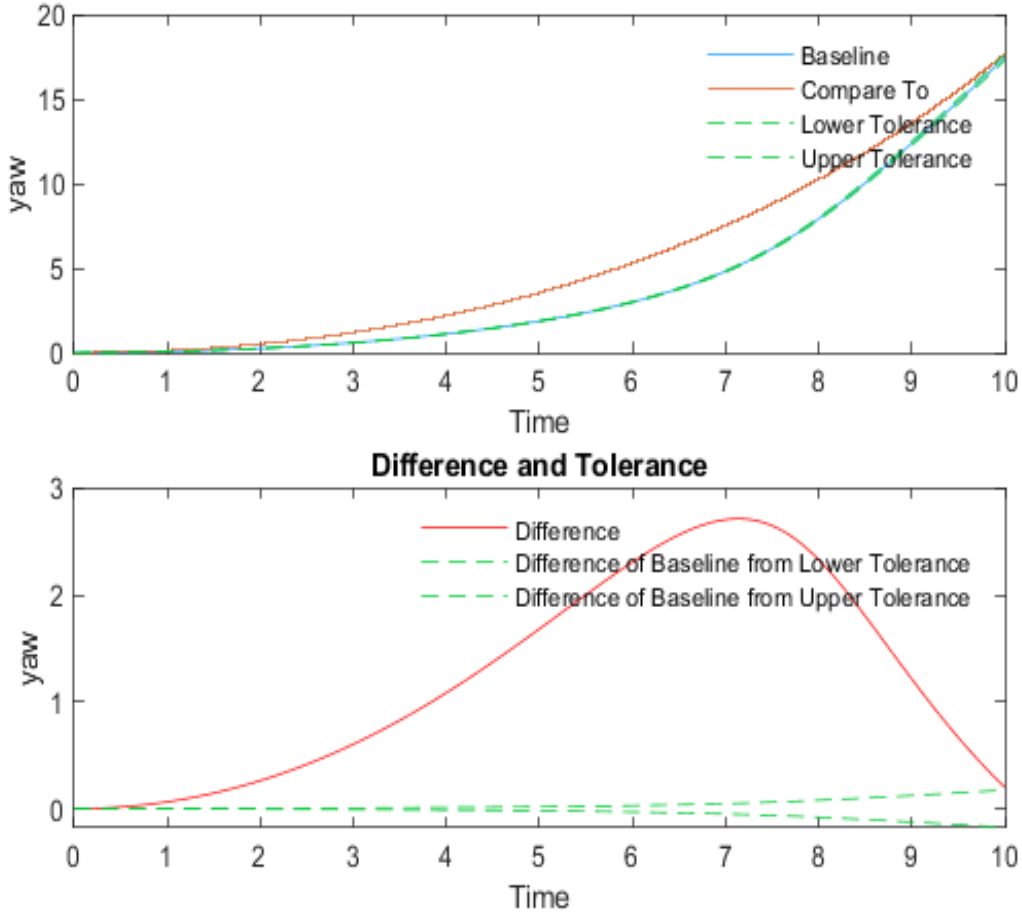
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
yaw	0	0.01	0	0	2.71	double		Continuous	double		0.001	linear	union



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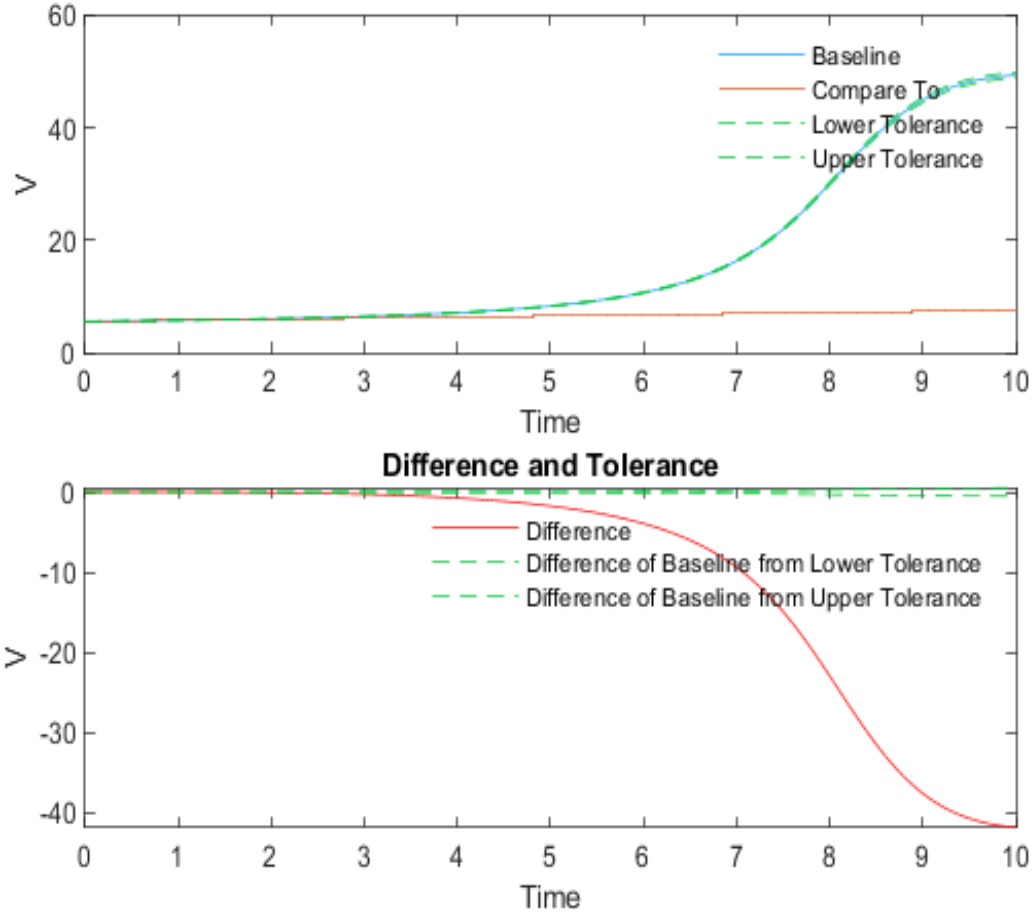
Name	Abs Tol	Rel Tol	Lead Tol	Lag Tol	Max Diff	Data Type 1	Units 1	Sample Time 1	Data Type 2	Units 2	Sample Time 2	Interp	Sync
V	0	0.01	0	0	41.8	double		Continuous	double		0.001	linear	union



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Input Data 1

Input Information

External Input Name: Combined2.mat

External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined2.mat

Input Data 2

Input Information

External Input Name: Combined2.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined2.mat

Simulation 1

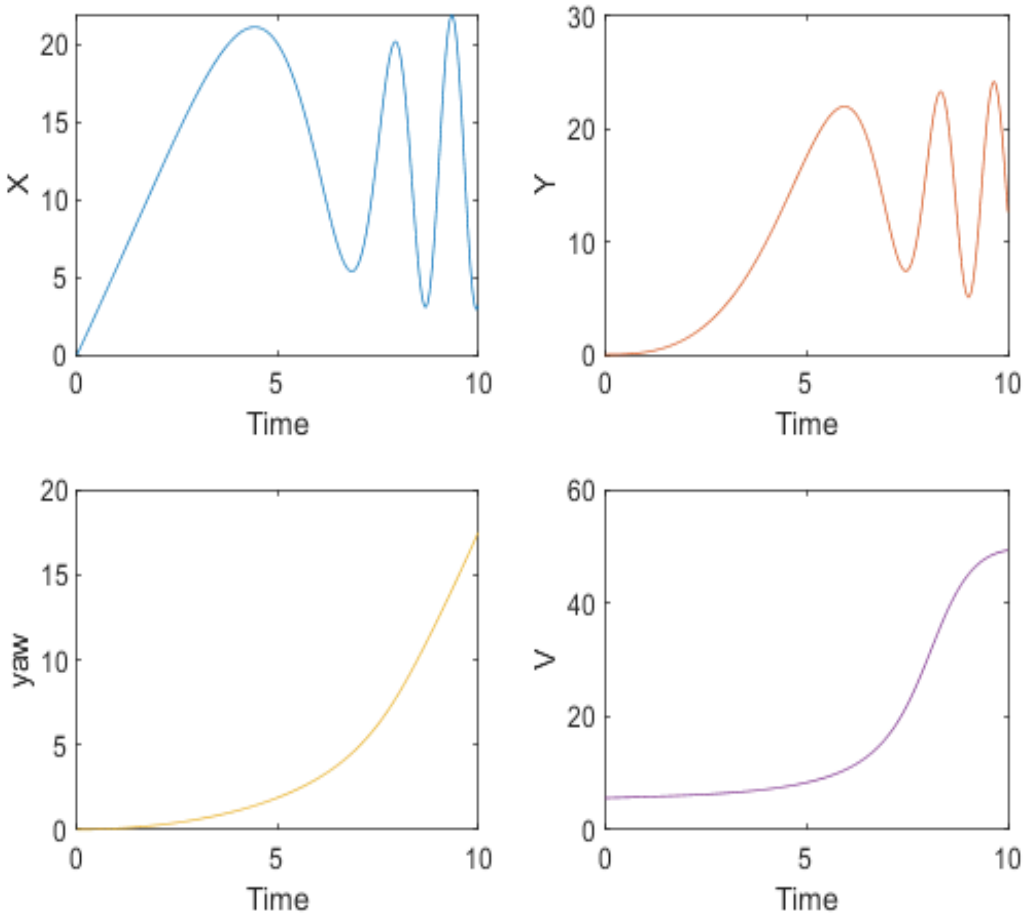
System Under Test Information

Model: Model_compare_SLX
Harness: Model_comparison_dynamic
Harness Owner: Model_compare_SLX/Dynamic_model
Simulation Mode: normal
Override SIL or PIL Mode: 0
Configuration Set: Configuration1
External Input Name: Combined2.mat
External Input File: C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined2.mat
Start Time: 0
Stop Time: 10
Checksum: 1828659065 1226848252 717113248 4124243503

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		Continuous	linear	union	Link
Y	double		Continuous	linear	union	Link
yaw	double		Continuous	linear	union	Link
V	double		Continuous	linear	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		Continuous	linear	union
Y	double		Continuous	linear	union
yaw	double		Continuous	linear	union
V	double		Continuous	linear	union



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Simulation 2

System Under Test Information

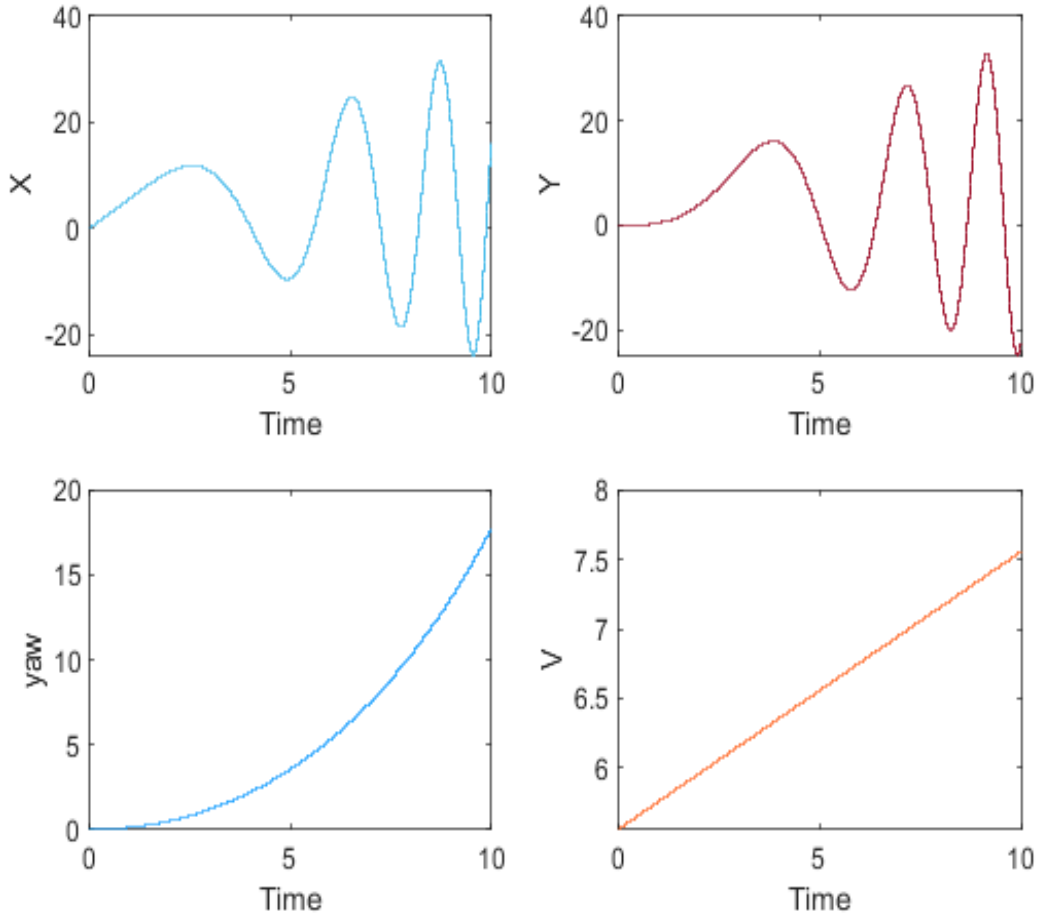
Model: Model_compare_SLX
Harness: Model_comparison_kinematic

Harness Owner:	Model_compare_SLX/Kinematic_model
Simulation Mode:	normal
Override SIL or PIL Mode:	0
Configuration Set:	Configuration1
External Input Name:	Combined2.mat
External Input File:	C:\Users\gianv\Documents\GitHub\Compliance_test\Matlab scripts\SimulinkModels\Combined2.mat
Start Time:	0
Stop Time:	10
Checksum:	2799456273 4233424247 1463475084 743274136

Simulation Output

Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
X	double		0.001	zoh	union	Link
Y	double		0.001	zoh	union	Link
yaw	double		0.001	zoh	union	Link
V	double		0.001	zoh	union	Link
Throttle	double		0.001	zoh	union	Link
Steering	double		0.001	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
X	double		0.001	zoh	union
Y	double		0.001	zoh	union
yaw	double		0.001	zoh	union
V	double		0.001	zoh	union



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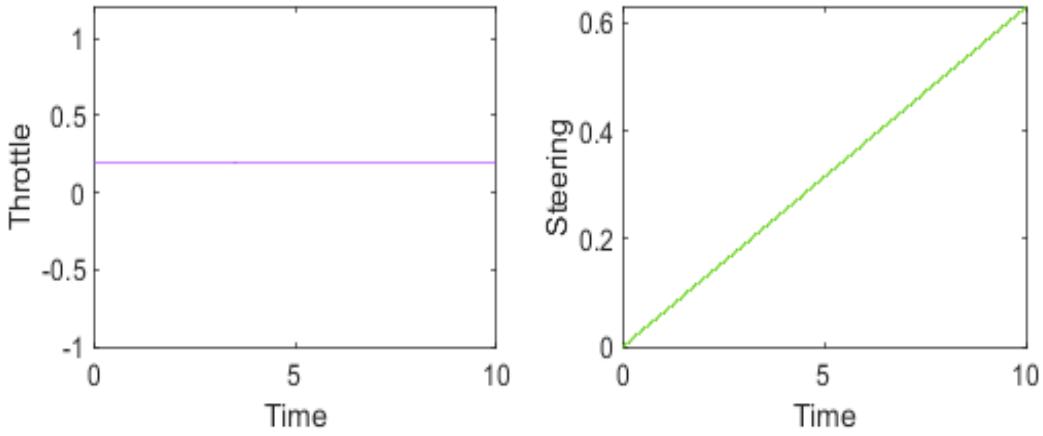
Name	Data Type	Units	Sample Time	Interp	Sync
Throttle	double		0.001	zoh	union
Steering	double		0.001	zoh	union



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