Validation process forENVIGADO

The epidemiology research group, EAFIT

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Chapter 1. Extension number1

1.1. Basic information

The extension to be validated consists of the time series from the data1 to the 113. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

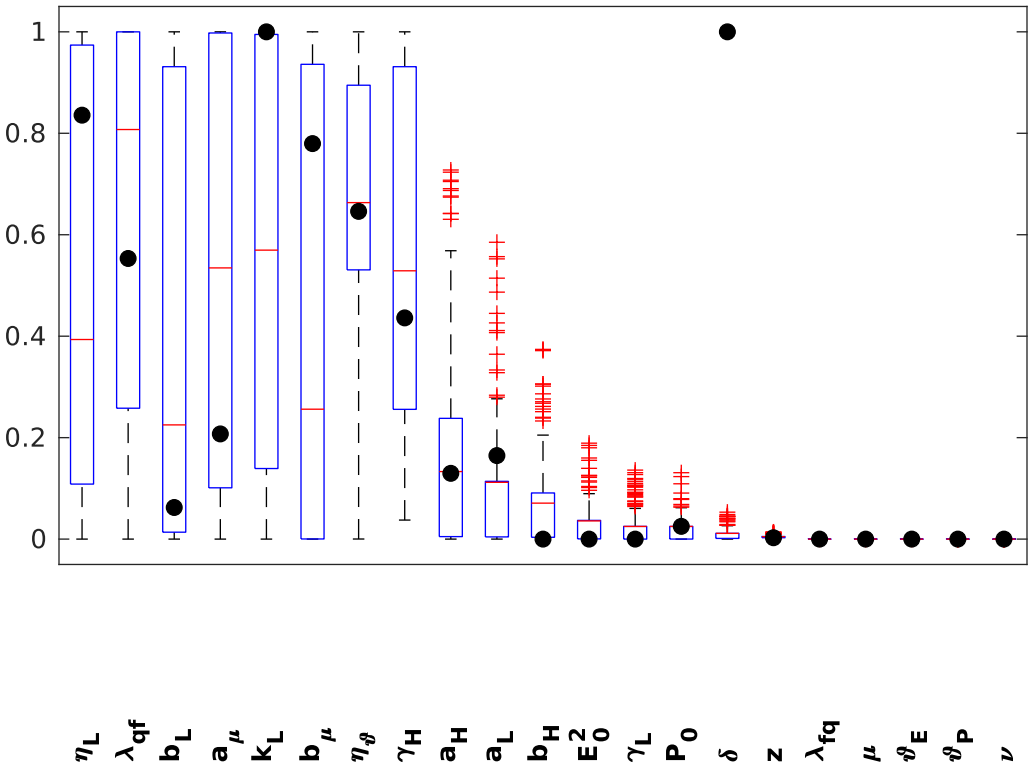
1.2. Estimated parameters with their intervals

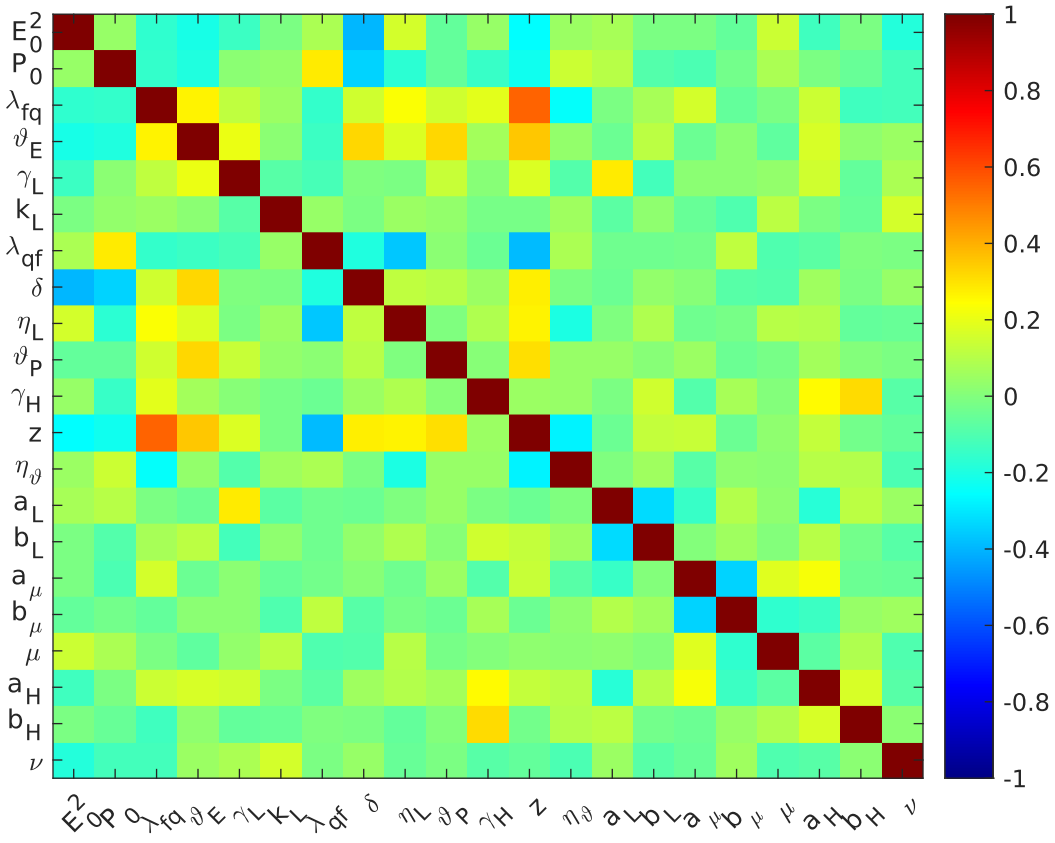
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
E^2_0	'0'	'0'	'73.776'	'0'	'0.0916'
P_0	'9.4063'	'12.5224'	'10.011'	'10.0487'	'0.0939'
\lambda_{fq}	'0'	'0'	'0'	'0'	'0.1042'
\vartheta_E	'0'	'0'	'0'	'0'	'0.07'
\gamma_L	'0'	'0'	'0.0251'	'0'	'0.0816'
k_L	'1'	'10'	'6.1267'	'9.9998'	'0.1056'
\lambda_{qf}	'0'	'1'	'0.8074'	'0.5532'	'0.1188'
\delta	'0.0993'	'0.15'	'0.0017'	'0.15'	'0.0878'
\eta_L	'0.3816'	'1'	'0.3935'	'0.8357'	'0.1195'
\vartheta_P	'0'	'0'	'0'	'0'	'0.0444'
\gamma_H	'0.4214'	'0.4403'	'0.5289'	'0.4361'	'0.1031'
z	'0.0744'	'0.0845'	'0.1431'	'0.0808'	'0.0999'
\eta_\vartheta	'0.2585'	'1'	'0.6633'	'0.6461'	'0.0867'
a_L	'1'	'15'	'2.5943'	'3.3049'	'0.1131'
b_L	'1'	'15'	'4.1519'	'1.8724'	'0.115'
a_\mu	'1'	'15'	'8.4846'	'3.9027'	'0.1163'
b_\mu	'1'	'15'	'4.5851'	'11.9152'	'0.1158'
\mu	'0'	'0'	'0'	'0'	'0.0675'
a_H	'2.7656'	'2.9279'	'2.8722'	'2.8152'	'0.113'
b_H	'1'	'1.0191'	'1.9948'	'1'	'0.0966'
\nu	'0'	'0'	'0'	'0'	'0.0603'

1.3. Identifiability analisys




E_0^2
P_0
λ_{fq}
ϑ_E
γ_L
k_L
λ_{qf}
δ
η_L
ϑ_P
γ_H
z
η_ϑ
a_L
b_L
a_μ
b_μ
μ
a_H
b_H
ν
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0.6
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0.2
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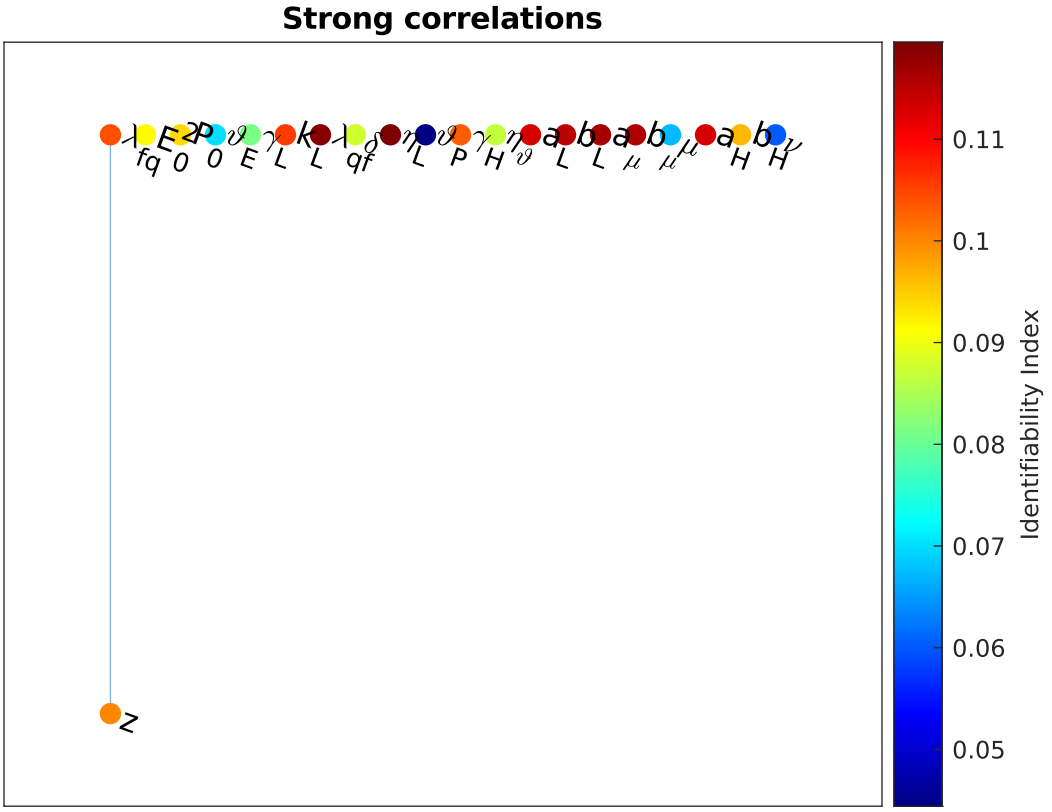
-0.4
-0.6
-0.8
-1


Strong correlations
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0.09
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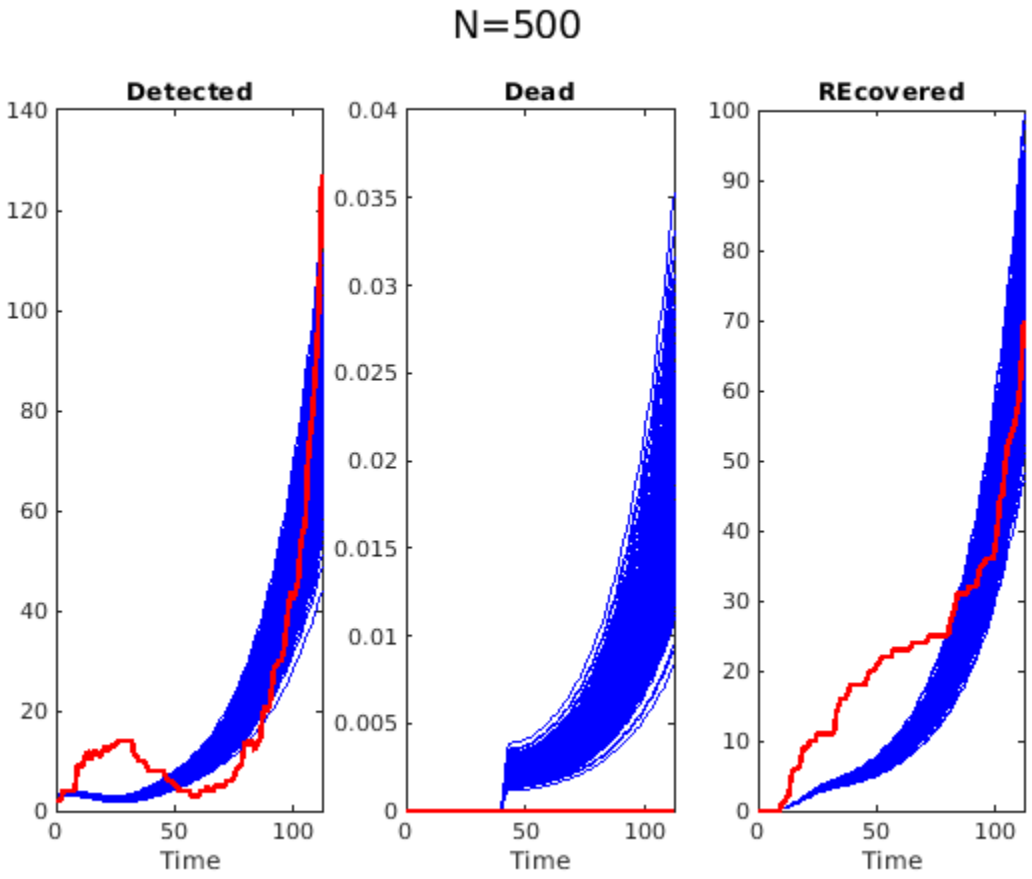
0.06
0.05
Identifiability Index

1.4. Uncertainty analisys



Chapter 2. Extension number2

2.1. Basic information

The extension to be validated consists of the time series from the data113 to the 139. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

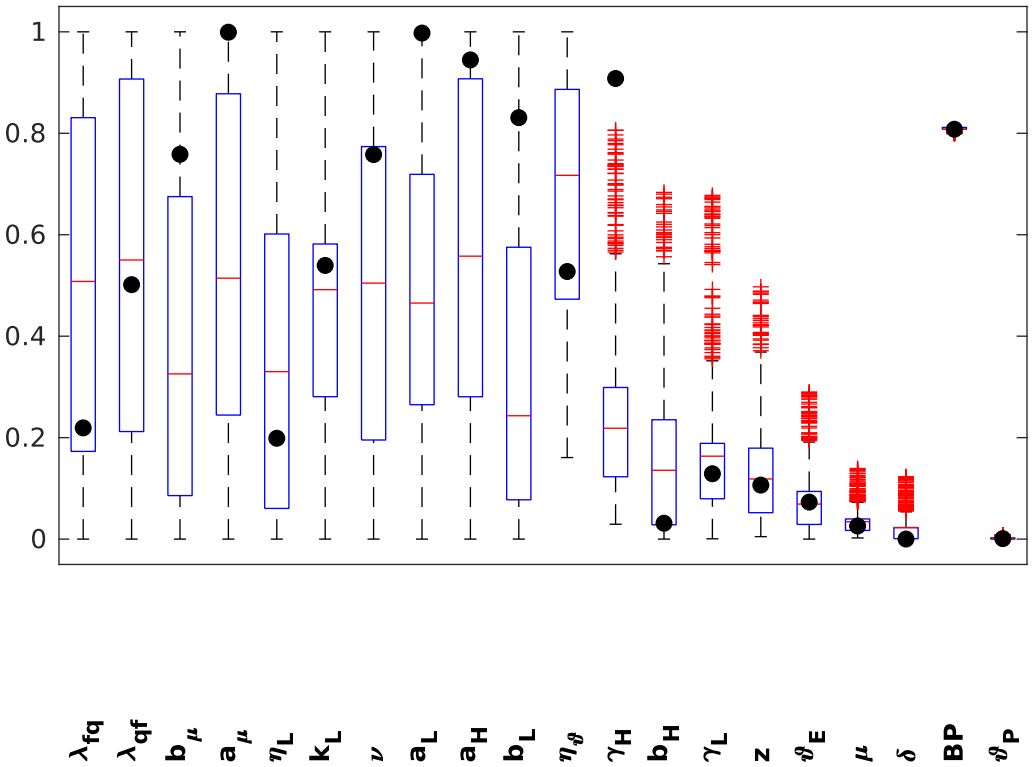
2.2. Estimated parameters with their intervals

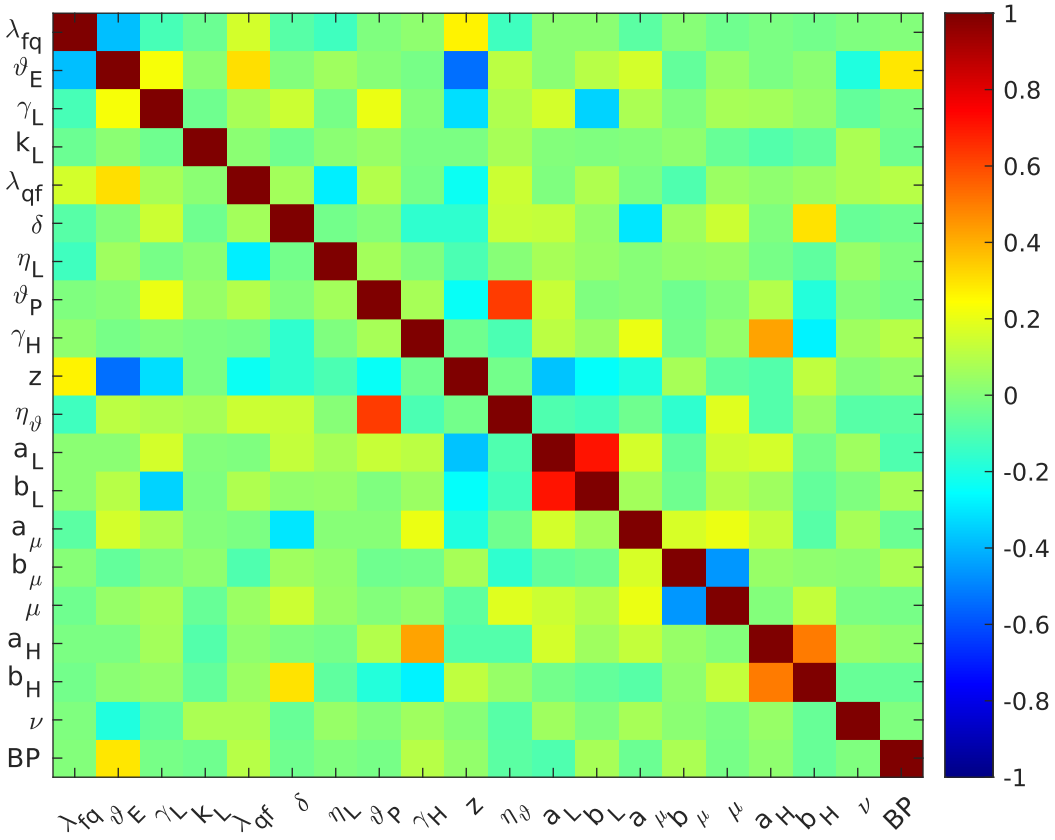
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.2169'	'0.6765'	'0.508'	'0.2192'	'0.0826'
\vartheta_E	'0.0144'	'0.1641'	'0.0691'	'0.0729'	'0.0861'
\gamma_L	'0.045'	'0.1652'	'0.1635'	'0.1289'	'0.0896'
k_L	'1.6638'	'10'	'5.4254'	'5.8552'	'0.0617'
\lambda_{qf}	'0'	'0.6313'	'0.5502'	'0.5016'	'0.088'
\delta	'0'	'0'	'0.0034'	'0'	'0.0719'
\eta_L	'0'	'0.4473'	'0.3301'	'0.1988'	'0.0741'
\vartheta_P	'0.0008'	'0.0025'	'0.0015'	'0.0009'	'0.0615'
\gamma_H	'0.1362'	'0.9136'	'0.2188'	'0.908'	'0.0817'
z	'2.0073'	'3.8183'	'3.5576'	'3.1943'	'0.1014'
\eta_\vartheta	'0.4921'	'0.5748'	'0.7171'	'0.5275'	'0.0941'
a_L	'11.4466'	'15'	'7.5146'	'14.9657'	'0.1014'
b_L	'7.5465'	'12.7037'	'4.4047'	'12.632'	'0.0988'
a_\mu	'11.9501'	'15'	'8.2014'	'14.9893'	'0.088'
b_\mu	'9.9903'	'15'	'5.5602'	'11.6198'	'0.0797'
\mu	'0.0185'	'0.0293'	'0.0344'	'0.0259'	'0.0682'
a_H	'9.3352'	'15'	'8.8085'	'14.2252'	'0.0975'
b_H	'1'	'4.1536'	'2.9053'	'1.438'	'0.0978'
\nu	'128.3884'	'500'	'252.3237'	'379.0261'	'0.073'
BP	'112.4577'	'116.9906'	'112.5'	'112.5'	'0.0401'

2.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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0.6
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0.2
0
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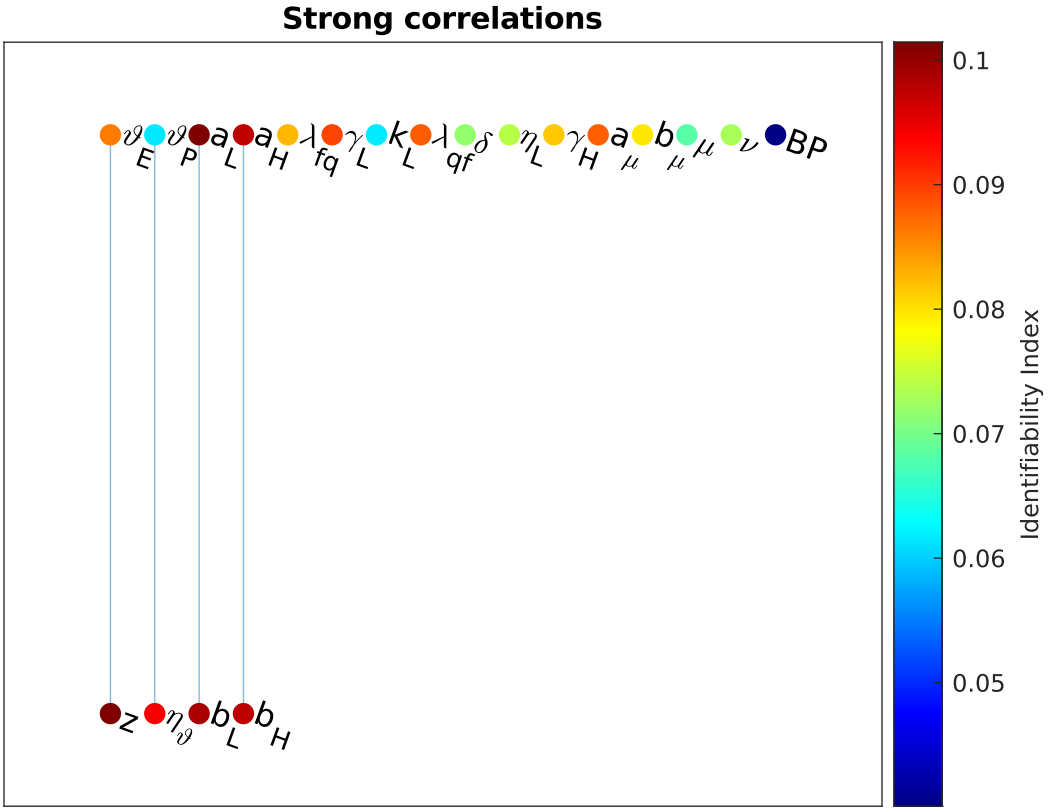
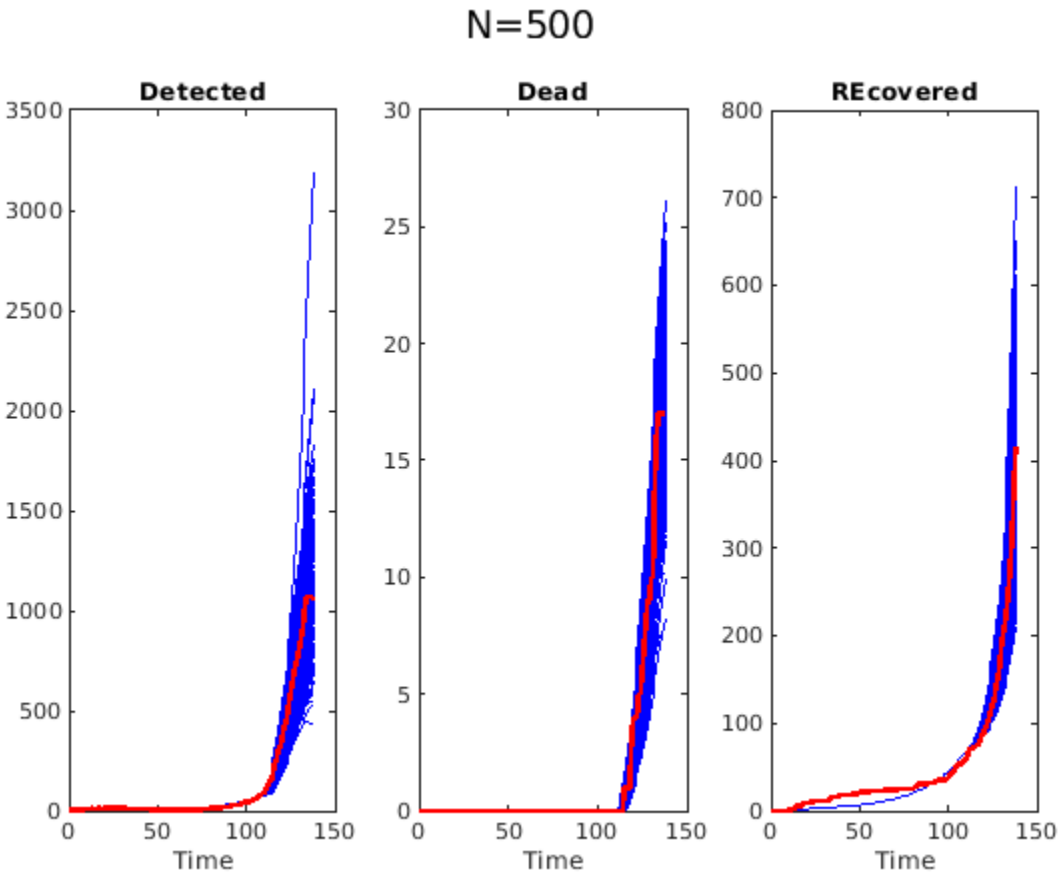
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.1
0.09
0.08
0.07
0.06
0.05

2.4. Uncertainty analisys



Chapter 3. Extension number3

3.1. Basic information

The extension to be validated consists of the time series from the data139 to the 164. The status of the validation is: COMPLETED.

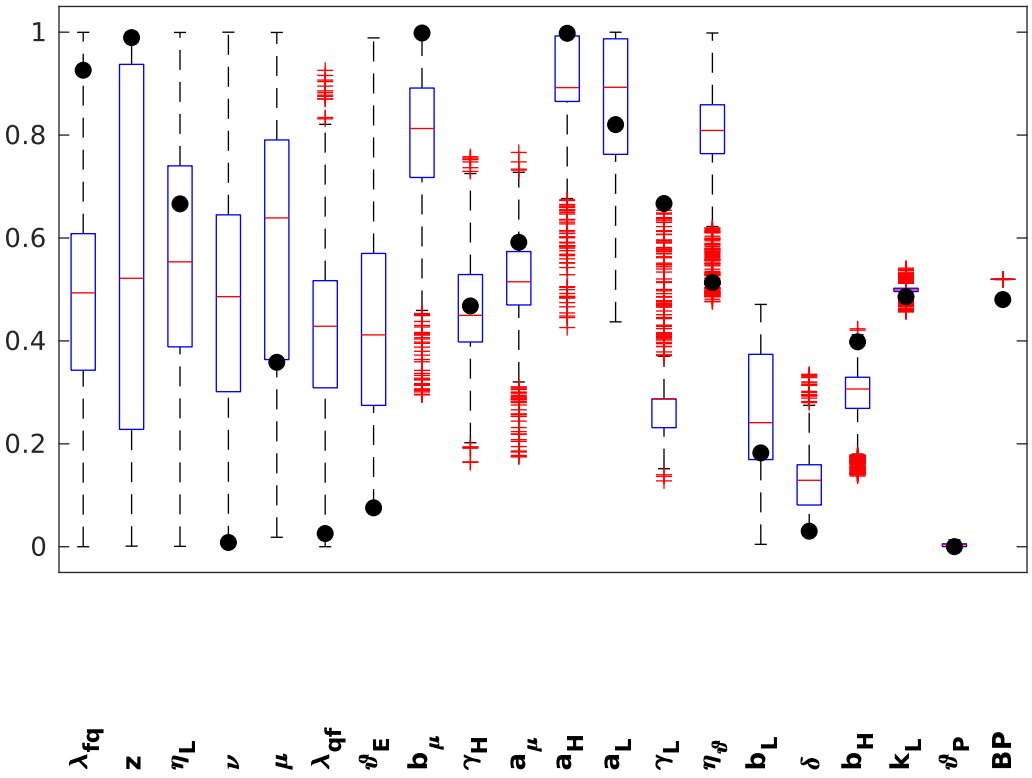
The number of estimations needed to perform the validation was1000.

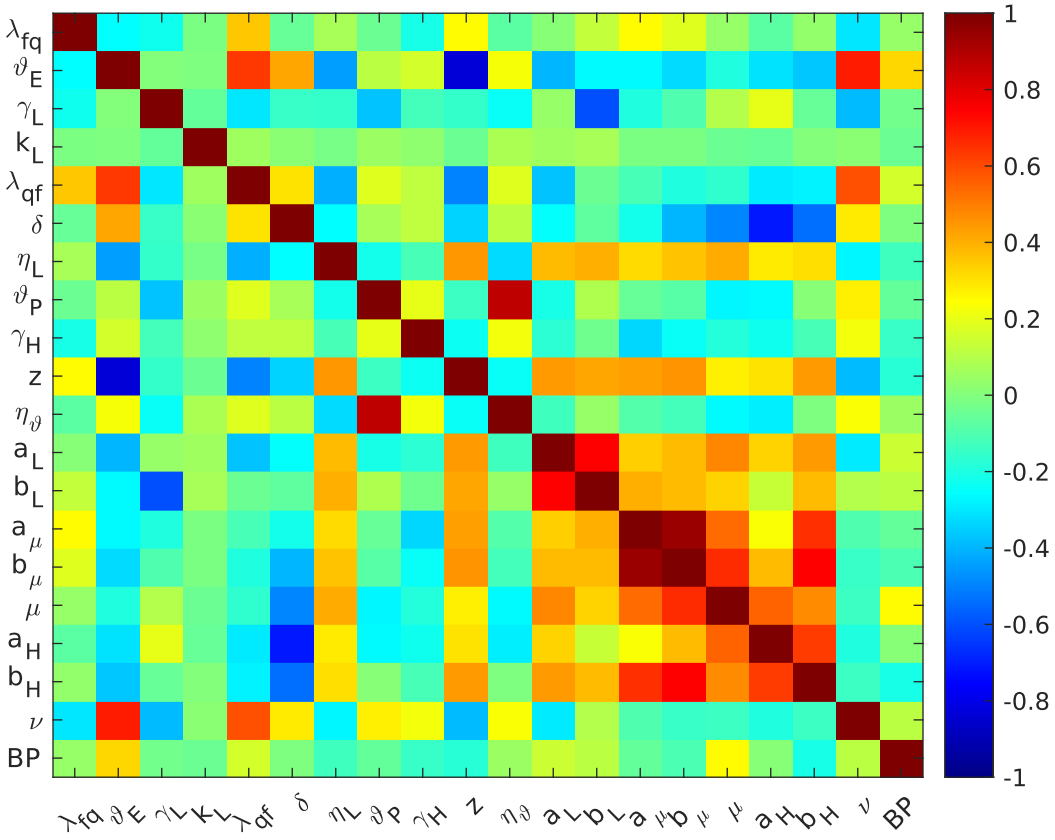
3.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4729'	'0.5139'	'0.4934'	'0.926'	'0.0782'
\vartheta_E	'0.392'	'0.4313'	'0.4117'	'0.0756'	'0.1598'
\gamma_L	'0.2616'	'0.3129'	'0.2872'	'0.667'	'0.1065'
k_L	'5.4124'	'5.5705'	'5.4915'	'5.3729'	'0.0424'
\lambda_{qf}	'0.4063'	'0.4507'	'0.4285'	'0.0256'	'0.1376'
\delta	'0.0167'	'0.022'	'0.0194'	'0.0045'	'0.1274'
\eta_L	'0.5301'	'0.5772'	'0.5536'	'0.6664'	'0.1149'
\vartheta_P	'0.0037'	'0.0043'	'0.004'	'0.0002'	'0.0823'
\gamma_H	'0.4361'	'0.4633'	'0.4497'	'0.468'	'0.0782'
z	'14.6366'	'16.6653'	'15.651'	'29.6809'	'0.1527'
\eta_\vartheta	'0.7903'	'0.8277'	'0.809'	'0.5136'	'0.1038'
a_L	'13.2446'	'13.7543'	'13.4995'	'12.4848'	'0.1259'
b_L	'4.2172'	'4.535'	'4.3761'	'3.5535'	'0.1207'
a_\mu	'7.9581'	'8.4595'	'8.2088'	'9.2822'	'0.1493'
b_\mu	'12.0343'	'12.7234'	'12.3788'	'14.9773'	'0.1647'
\mu	'0.6119'	'0.6661'	'0.639'	'0.3584'	'0.163'
a_H	'13.1023'	'13.8804'	'13.4914'	'14.9695'	'0.1584'
b_H	'5.1515'	'5.4319'	'5.2917'	'6.575'	'0.1575'
\nu	'230.7017'	'255.2873'	'242.9945'	'4.143'	'0.1355'
BP	'139.416'	'139.584'	'139.5'	'137.4999'	'0.0537'

3.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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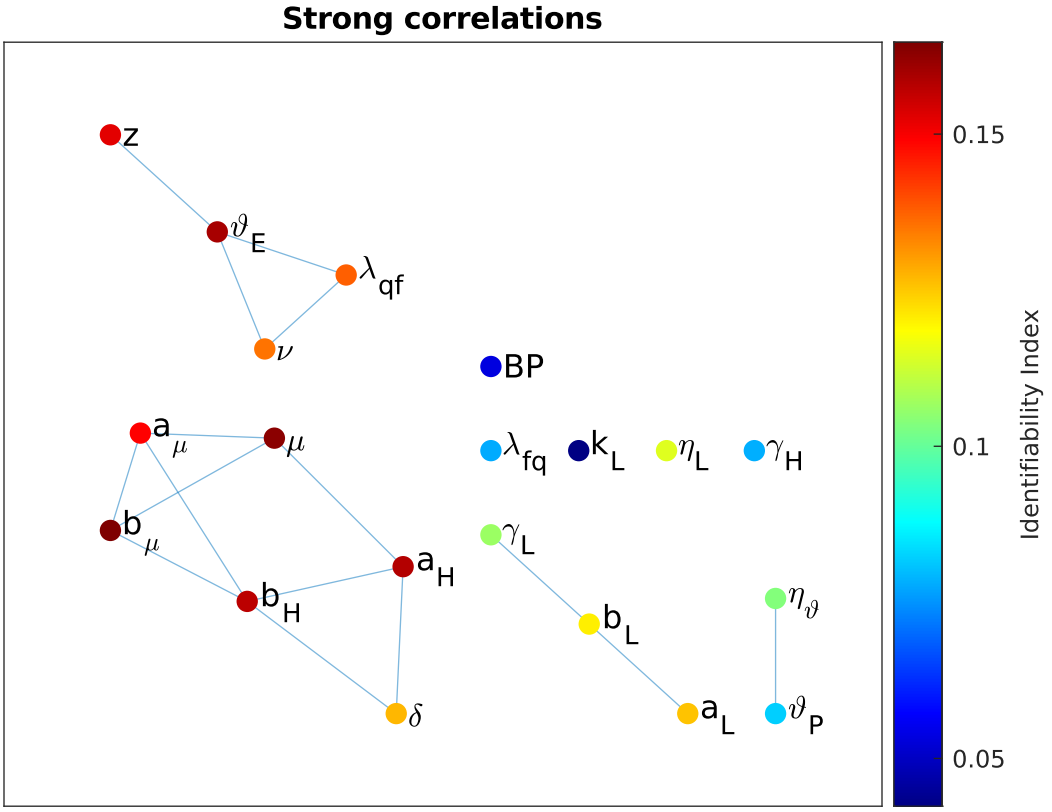
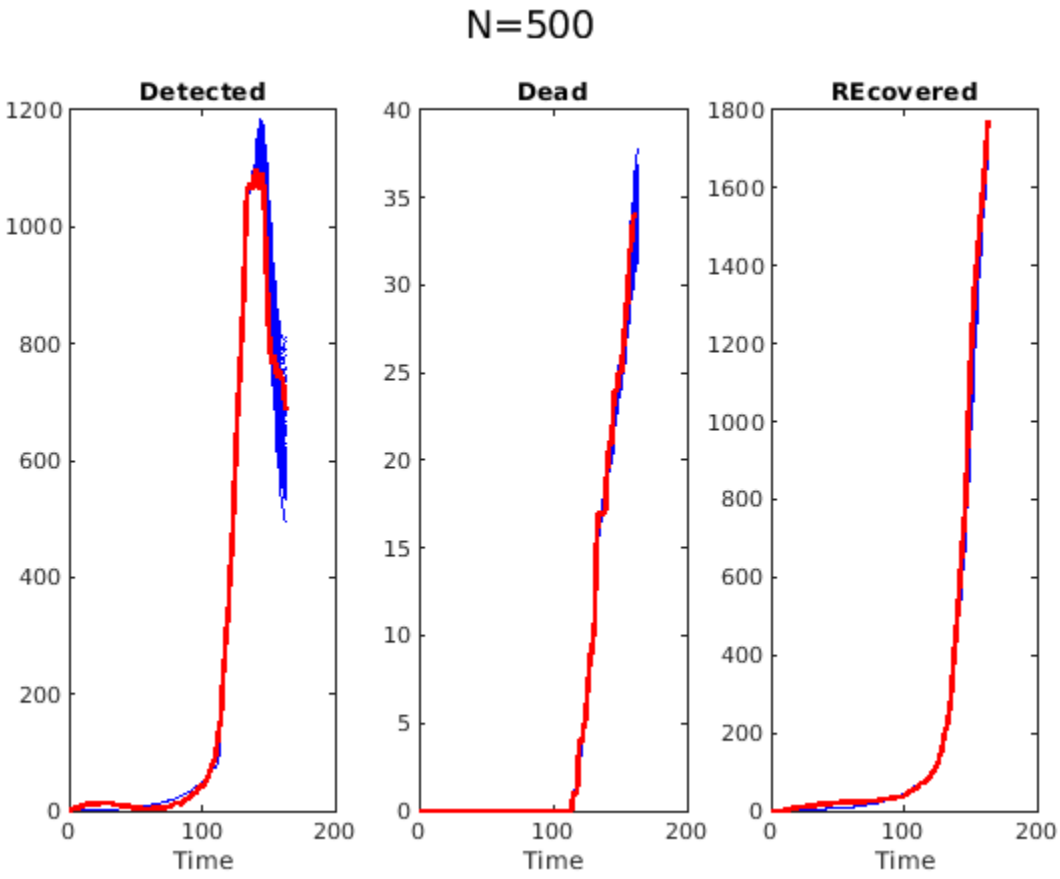
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
z
ϑ_E
λ_{qf}
ν
BP
a μ
μ
λ_{fq}
k_L
η_L
γ_H
b μ
γ_L
a_H
b_H
η_ϑ
b_L
δ
a_L
ϑ_P
0.15
0.1
0.05
Identifiability Index

3.4. Uncertainty analisys



Chapter 4. Extension number4

4.1. Basic information

The extension to be validated consists of the time series from the data164 to the 194. The status of the validation is: COMPLETED.

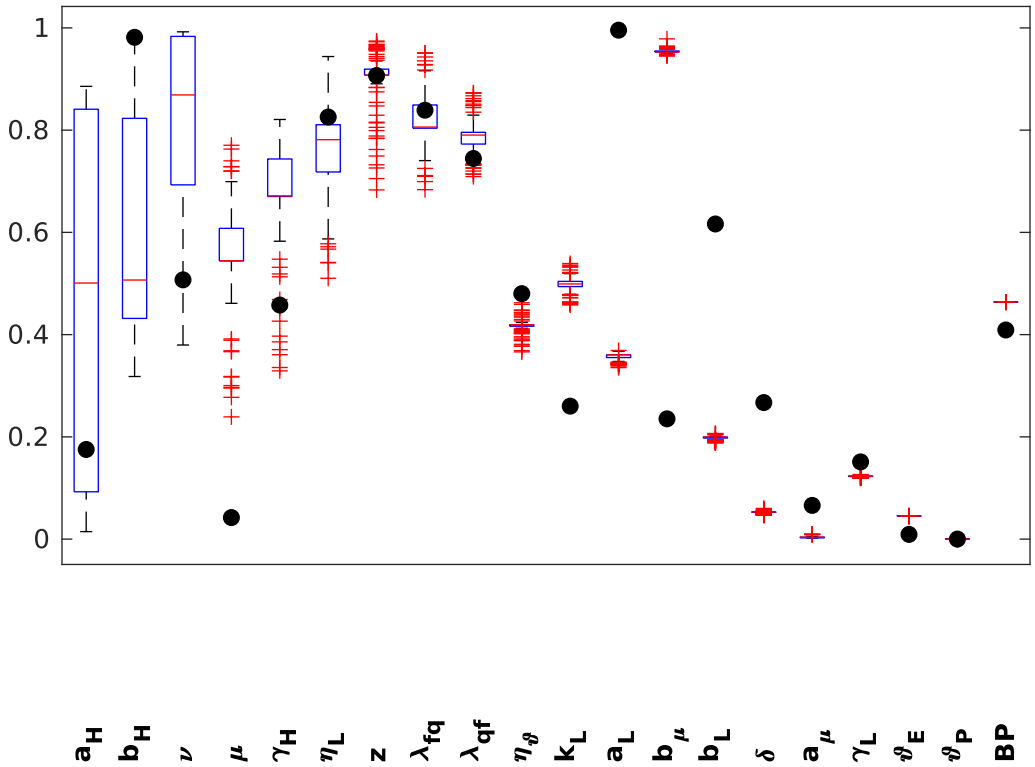
The number of estimations needed to perform the validation was1000.

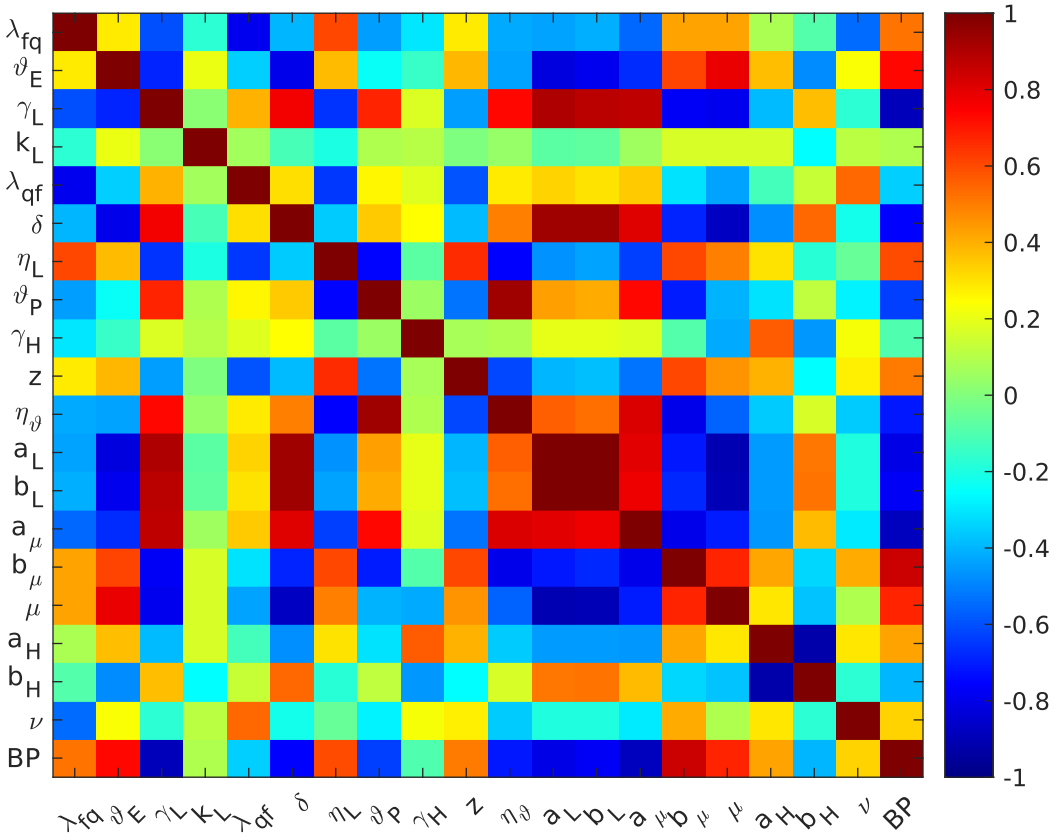
4.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.7882'	'0.824'	'0.8061'	'0.839'	'0.215'
\vartheta_E	'0.0433'	'0.0473'	'0.0453'	'0.0092'	'0.2443'
\gamma_L	'0.1207'	'0.1258'	'0.1232'	'0.1511'	'0.3174'
k_L	'5.4119'	'5.5726'	'5.4923'	'3.341'	'0.0611'
\lambda_{qf}	'0.7805'	'0.8003'	'0.7904'	'0.7446'	'0.1691'
\delta	'0.0054'	'0.0105'	'0.008'	'0.0401'	'0.2849'
\eta_L	'0.7506'	'0.812'	'0.7813'	'0.8256'	'0.2786'
\vartheta_P	'0'	'0.0005'	'0.0001'	'0.0001'	'0.2166'
\gamma_H	'0.6121'	'0.7308'	'0.6715'	'0.4579'	'0.1456'
z	'25.7999'	'28.6598'	'27.2299'	'27.2044'	'0.2572'
\eta_\vartheta	'0.3916'	'0.4473'	'0.4194'	'0.4802'	'0.2983'
a_L	'5.4056'	'6.6884'	'6.047'	'14.9376'	'0.3322'
b_L	'3.3501'	'4.2437'	'3.7969'	'9.6303'	'0.3143'
a_\mu	'1'	'1.2153'	'1.0544'	'1.9235'	'0.3361'
b_\mu	'13.8785'	'14.7951'	'14.3368'	'4.2939'	'0.3405'
\mu	'0.5034'	'0.5854'	'0.5444'	'0.0422'	'0.3087'
a_H	'6.8785'	'9.1472'	'8.0128'	'3.4549'	'0.2215'
b_H	'7.4427'	'8.7476'	'8.0952'	'14.7418'	'0.2046'
\nu	'414.9283'	'453.949'	'434.4386'	'253.5786'	'0.1512'
BP	'164.3156'	'164.6843'	'164.5'	'161.4997'	'0.3281'

4.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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-0.4
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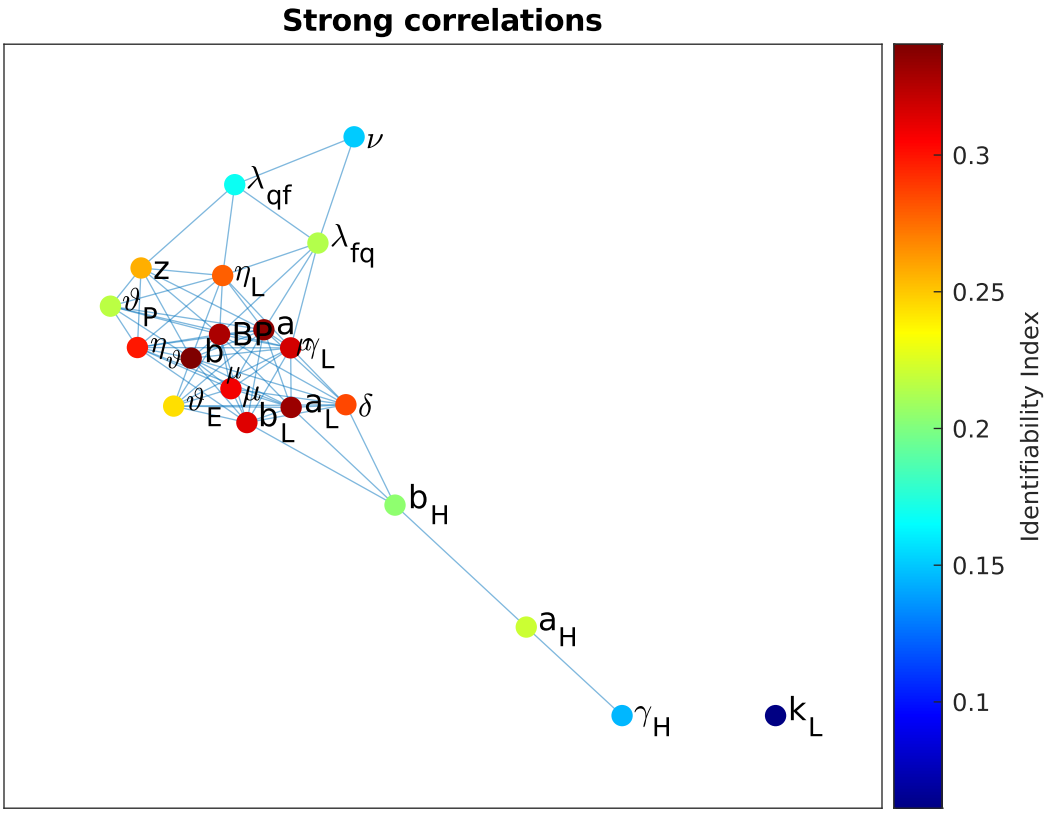
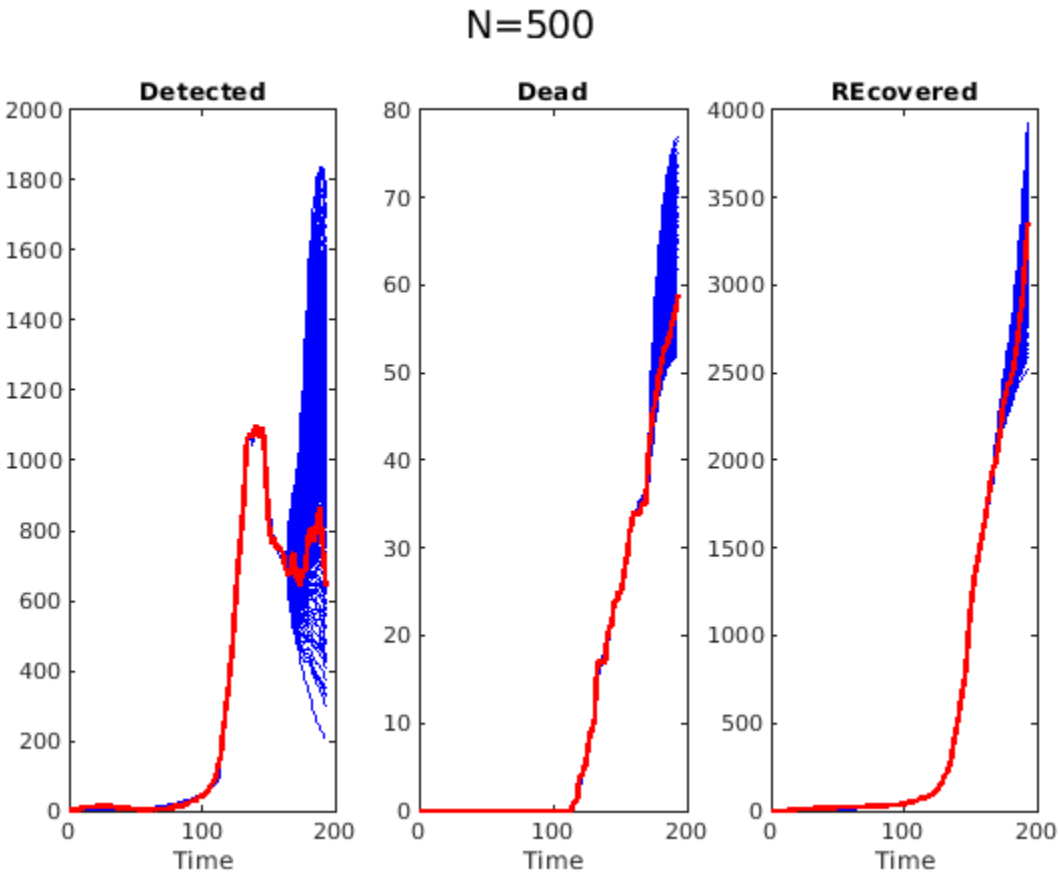
-0.8
-1


Strong correlations
ν
λ_{qf}
λ_{fq}
z
η_L
ϑ_P
BP
a
γ_L
η_ϑ
b
μ
ϑ_E
μ_L
b_L
a_L
δ
b_H
a_H
γ_H
k_L
0.3
0.25
0.2
0.15
0.1
Identifiability Index

4.4. Uncertainty analisys



Chapter 5. Extension number5

5.1. Basic information

The extension to be validated consists of the time series from the data194 to the 219. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

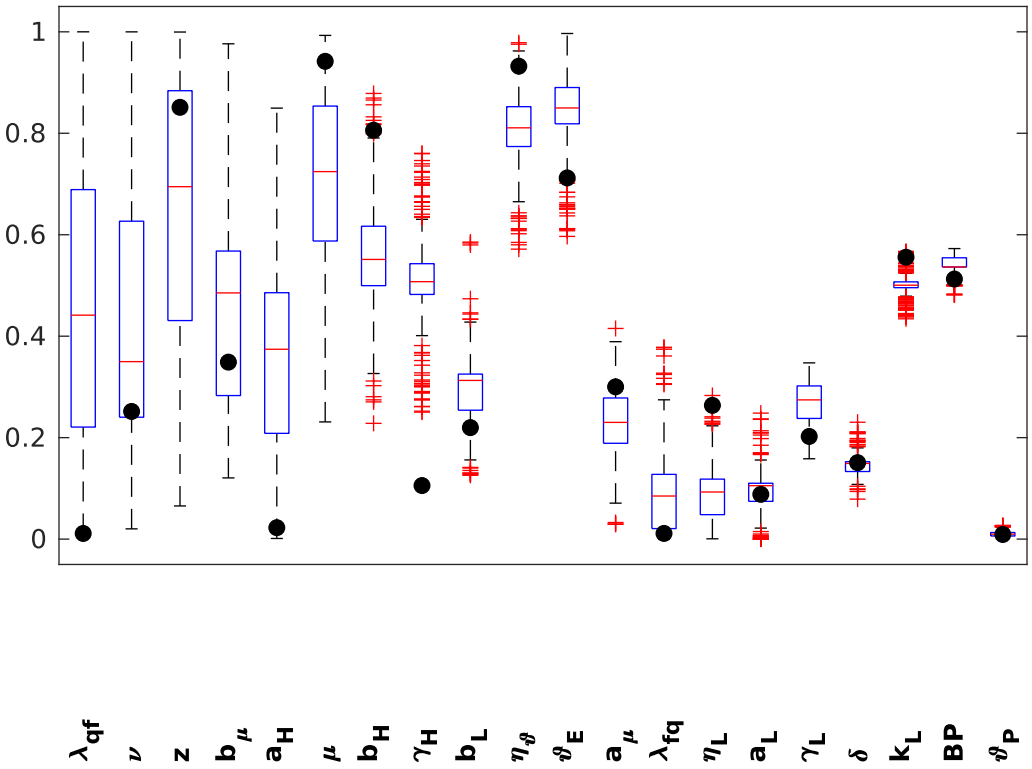
5.2. Estimated parameters with their intervals

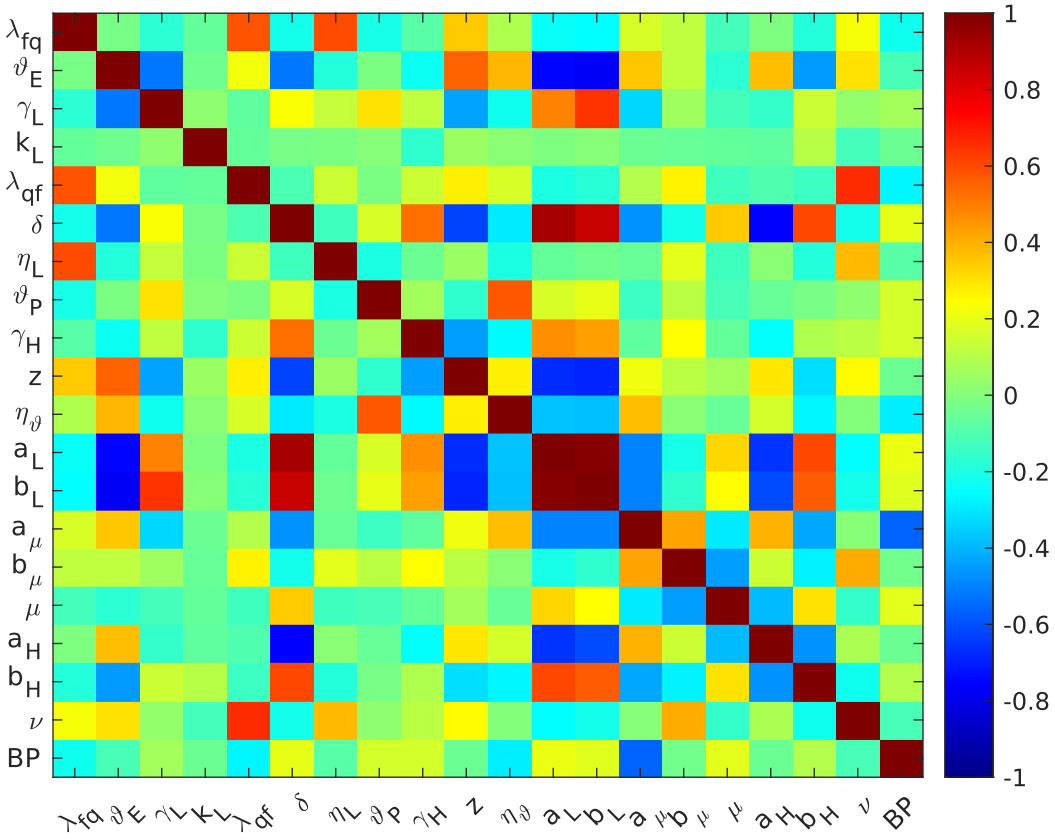
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.008'	'0.0143'	'0.0849'	'0.0112'	'0.1236'
\vartheta_E	'0.3283'	'0.7355'	'0.8499'	'0.712'	'0.1897'
\gamma_L	'0.0579'	'0.3655'	'0.2744'	'0.2024'	'0.1158'
k_L	'1.18'	'10'	'5.5045'	'6.0008'	'0.0494'
\lambda_{qf}	'0.0081'	'0.0167'	'0.4414'	'0.0111'	'0.1421'
\delta	'0'	'0.0404'	'0.0224'	'0.0226'	'0.2531'
\eta_L	'0.2363'	'0.377'	'0.0929'	'0.2637'	'0.106'
\vartheta_P	'0.0028'	'0.0129'	'0.0097'	'0.0091'	'0.0722'
\gamma_H	'0.0338'	'0.2376'	'0.5074'	'0.1056'	'0.1127'
z	'18.0811'	'25.9523'	'20.8415'	'25.5352'	'0.1917'
\eta_\vartheta	'0.7662'	'0.9747'	'0.8107'	'0.9322'	'0.1132'
a_L	'1.9312'	'2.844'	'2.4741'	'2.2356'	'0.2357'
b_L	'3.8672'	'5.941'	'5.3792'	'4.0769'	'0.2504'
a_\mu	'4.7122'	'15'	'4.221'	'5.2021'	'0.1174'
b_\mu	'1.322'	'13.3777'	'7.7943'	'5.8838'	'0.0988'
\mu	'0.2892'	'0.9716'	'0.7244'	'0.9419'	'0.0965'
a_H	'1'	'12.592'	'6.2394'	'1.315'	'0.1559'
b_H	'1.2688'	'14.44'	'8.7183'	'12.2856'	'0.155'
\nu	'116.3267'	'135.7553'	'174.9266'	'125.8221'	'0.1219'
BP	'192.1506'	'194.4388'	'193.5'	'192.1969'	'0.0786'

5.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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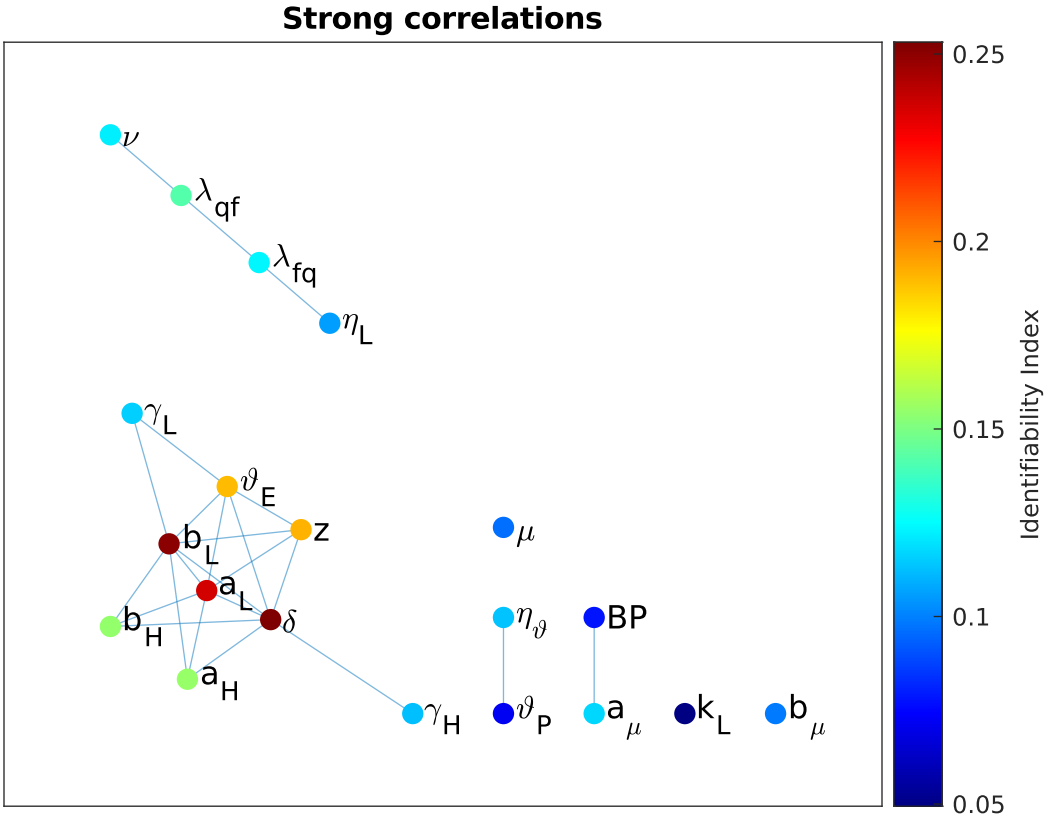
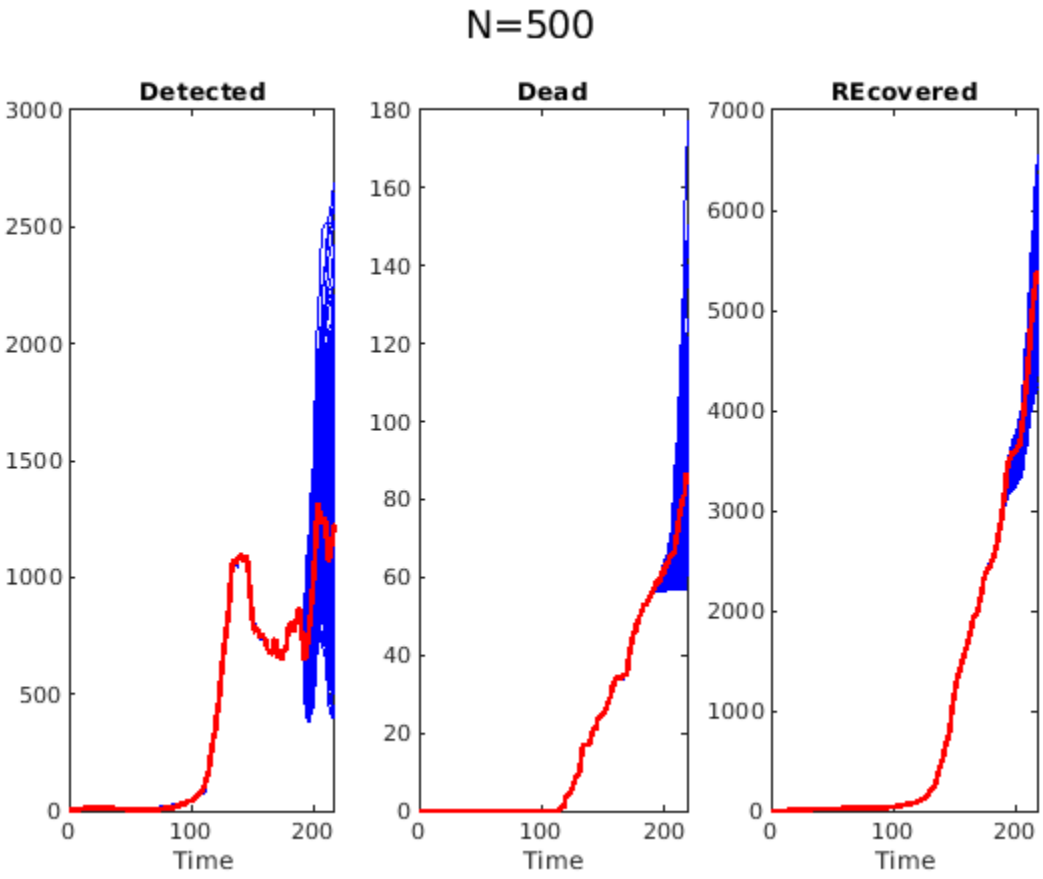
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
ν
λ_{qf}
λ_{fq}
η_L
γ_L
ϑ_E
z
b_L
a_L
b_H
δ
a_H
γ_H
μ
η_ϑ
BP
ϑ_P
a_μ
k_L
b_μ
0.25
0.2
0.15
0.1
0.05
Identifiability Index

5.4. Uncertainty analisys



Chapter 6. Extension number6

6.1. Basic information

The extension to be validated consists of the time series from the data219 to the 246. The status of the validation is: COMPLETED.

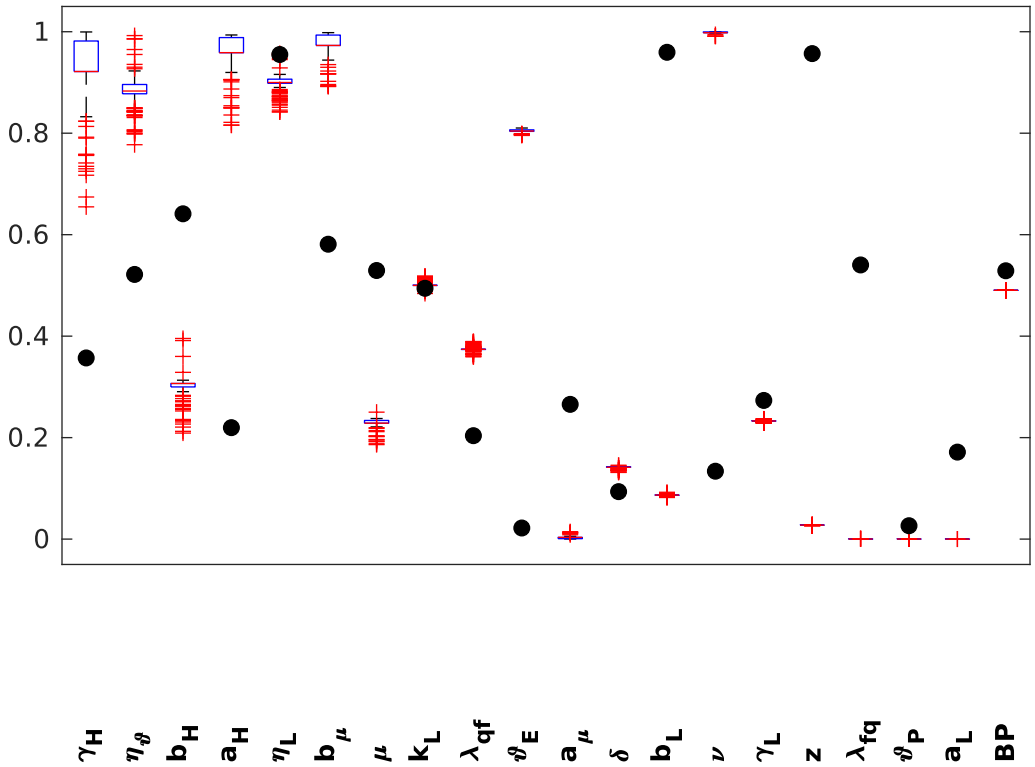
The number of estimations needed to perform the validation was1000.

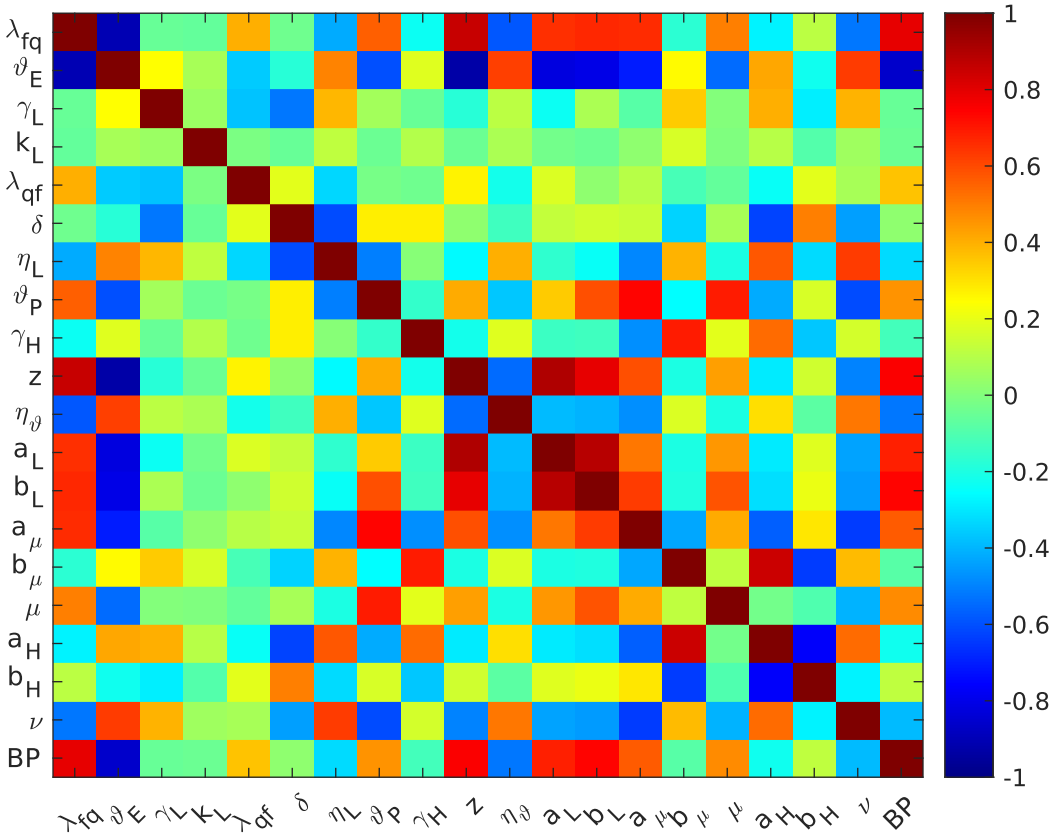
6.2. Estimated parameters with their intervals

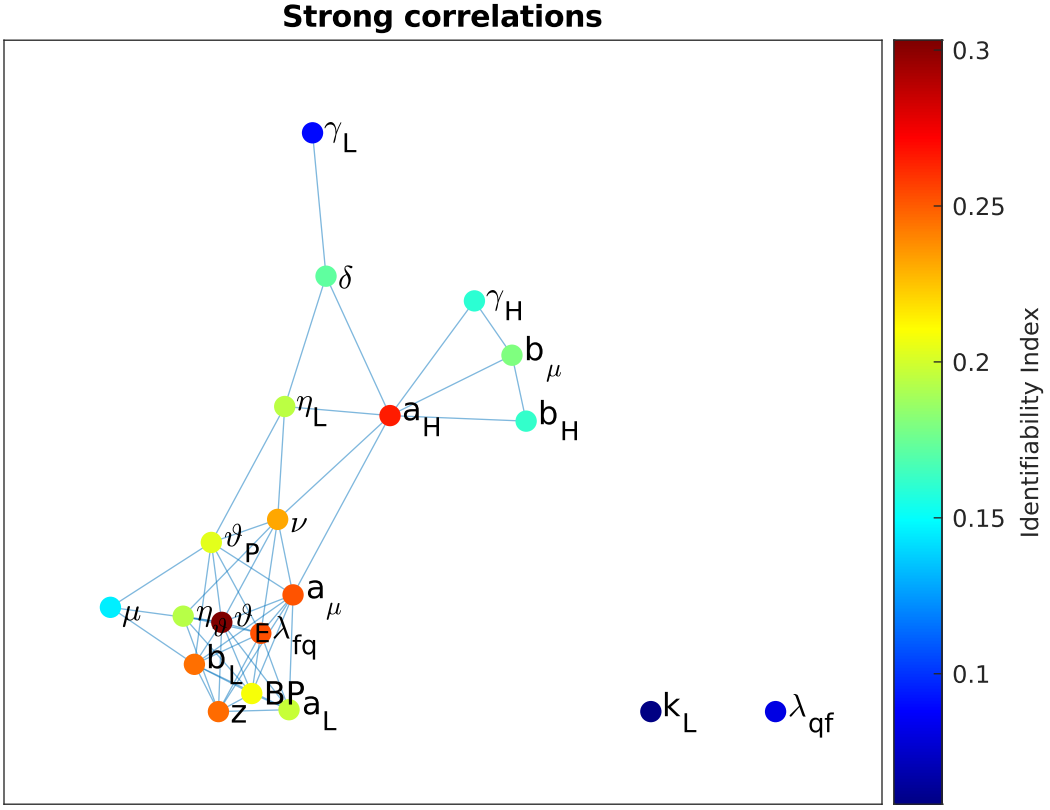
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0195'	'0.0002'	'0.5403'	'0.2528'
\vartheta_E	'0.7737'	'0.8349'	'0.8043'	'0.0219'	'0.3032'
\gamma_L	'0.2291'	'0.2365'	'0.2328'	'0.2733'	'0.09'
k_L	'5.3378'	'5.6625'	'5.5002'	'5.449'	'0.0582'
\lambda_{qf}	'0.3617'	'0.3864'	'0.3741'	'0.2038'	'0.0818'
\delta	'0.0136'	'0.0289'	'0.0212'	'0.014'	'0.1725'
\eta_L	'0.8668'	'0.9331'	'0.8999'	'0.9551'	'0.1941'
\vartheta_P	'0'	'0.0017'	'0.0002'	'0.0264'	'0.2039'
\gamma_H	'0.8642'	'0.979'	'0.9216'	'0.357'	'0.1604'
z	'0'	'1.7364'	'0.8284'	'28.7064'	'0.2458'
\eta_\vartheta	'0.856'	'0.9102'	'0.8831'	'0.5216'	'0.1932'
a_L	'1'	'1.0632'	'1.0006'	'3.4004'	'0.1973'
b_L	'1.9165'	'2.514'	'2.2152'	'14.4324'	'0.2456'
a_\mu	'1'	'1.2166'	'1.0476'	'4.7179'	'0.2518'
b_\mu	'13.7906'	'15'	'14.6201'	'9.1364'	'0.1806'
\mu	'0.2132'	'0.2438'	'0.2285'	'0.5294'	'0.146'
a_H	'13.4422'	'15'	'14.4205'	'4.0751'	'0.2652'
b_H	'4.6037'	'5.9844'	'5.294'	'9.9761'	'0.1623'
\nu	'481.2904'	'500'	'498.993'	'66.8996'	'0.2317'
BP	'219.3998'	'219.6002'	'219.5'	'221.5'	'0.2093'

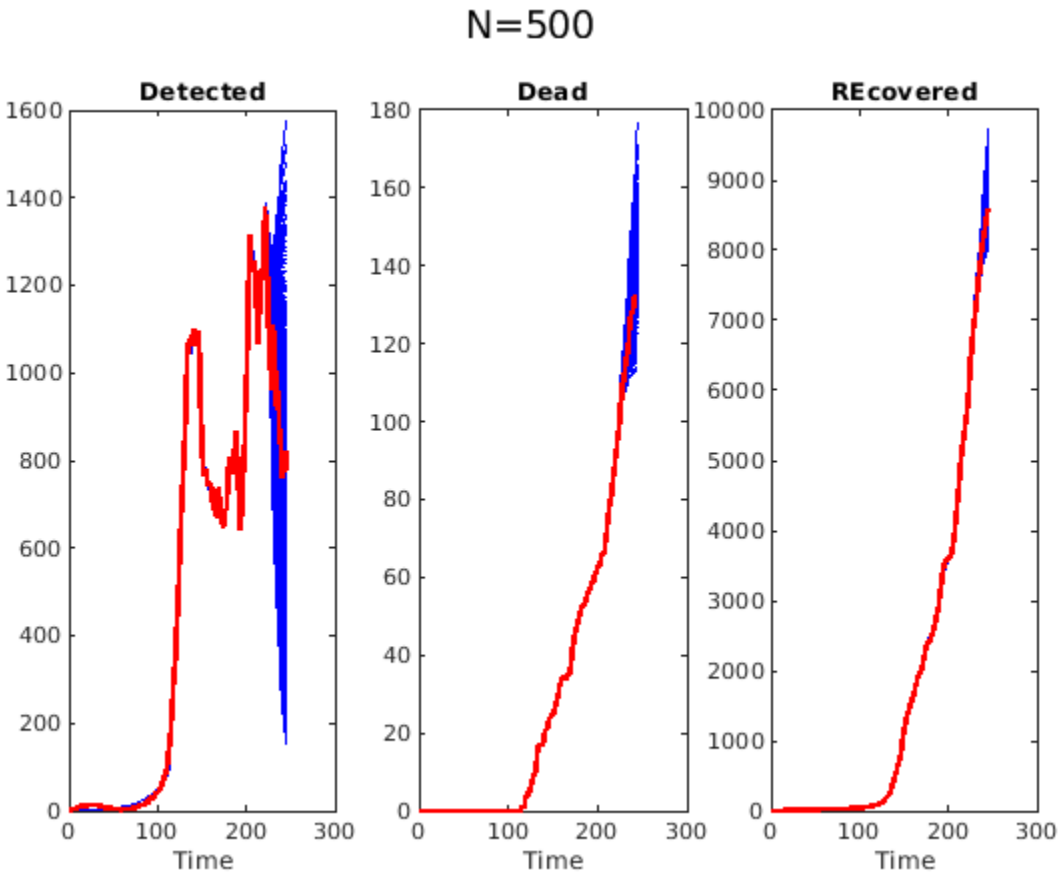
6.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
γ_L
δ
γ_H
b_μ
η_L
a_H
b_H
ν
ϑ_P
a_μ
μ
η_ϕ
ϑ_ϕ
E
λ_{fq}
b_L
BP
z
a_L
k_L
λ_{qf}
0.3
0.25
0.2
0.15
0.1
Identifiability Index

6.4. Uncertainty analisys



Chapter 7. Extension number7

7.1. Basic information

The extension to be validated consists of the time series from the data246 to the 273. The status of the validation is: COMPLETED.

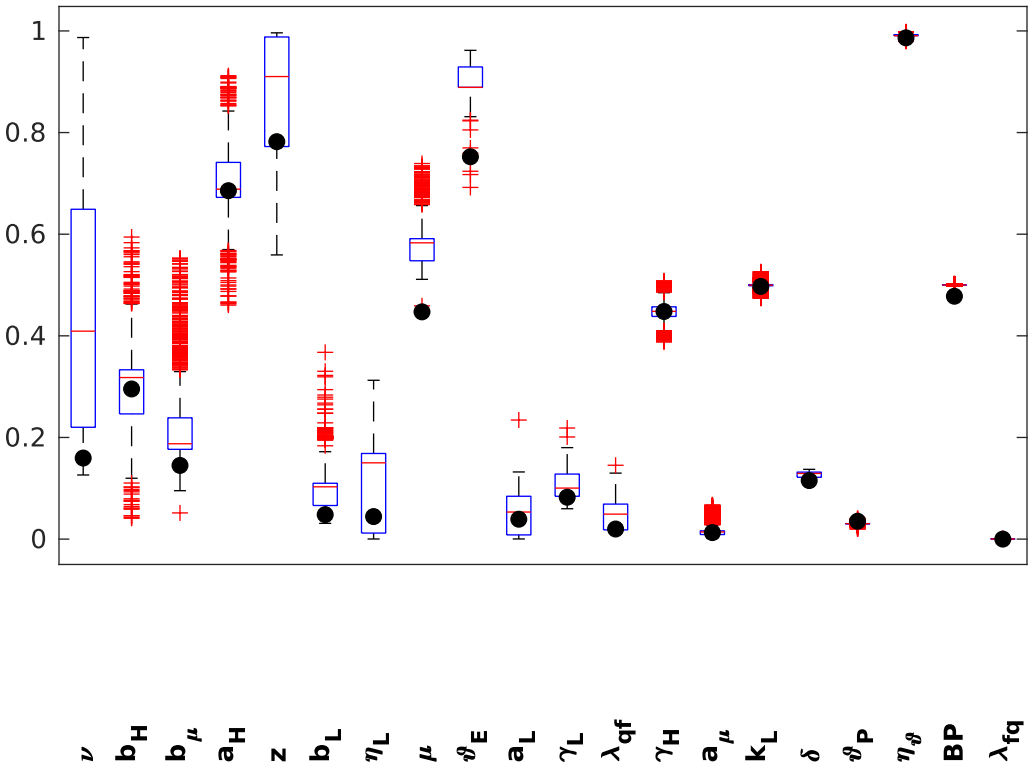
The number of estimations needed to perform the validation was1000.

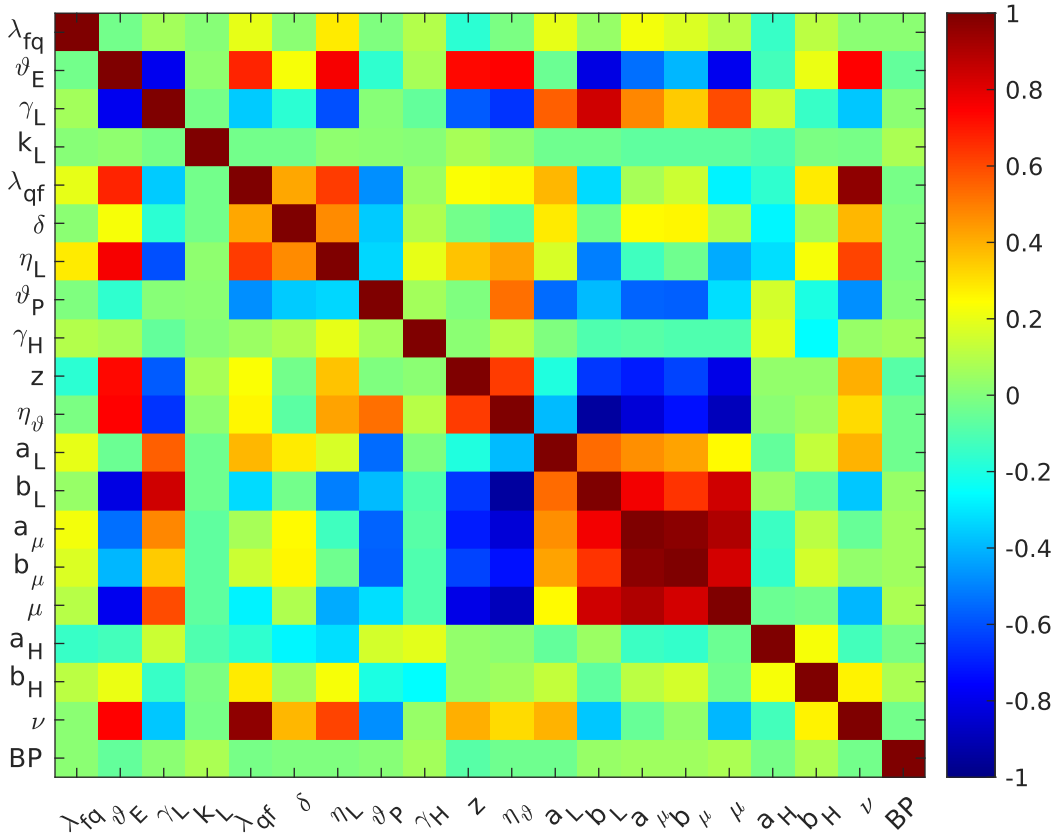
7.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0005'	'0.0002'	'0'	'0.0495'
\vartheta_E	'0.8647'	'0.9132'	'0.889'	'0.7524'	'0.2607'
\gamma_L	'0.0978'	'0.103'	'0.1004'	'0.0824'	'0.1999'
k_L	'5.4435'	'5.5518'	'5.4977'	'5.4754'	'0.0402'
\lambda_{qf}	'0.0471'	'0.0512'	'0.0491'	'0.0198'	'0.1393'
\delta	'0.0192'	'0.0196'	'0.0194'	'0.0173'	'0.0709'
\eta_L	'0.1429'	'0.1573'	'0.1501'	'0.0443'	'0.1761'
\vartheta_P	'0.0276'	'0.0332'	'0.0304'	'0.0352'	'0.1423'
\gamma_H	'0.4418'	'0.4547'	'0.4482'	'0.4479'	'0.0526'
z	'26.8125'	'27.7994'	'27.306'	'23.4613'	'0.2084'
\eta_\vartheta	'0.9659'	'1'	'0.9906'	'0.9864'	'0.2377'
a_L	'1.6759'	'1.8156'	'1.7458'	'1.5477'	'0.1312'
b_L	'2.0413'	'2.8401'	'2.4407'	'1.6734'	'0.2654'
a_\mu	'1.1573'	'1.2346'	'1.196'	'1.1789'	'0.2079'
b_\mu	'3.4308'	'3.8219'	'3.6264'	'3.0298'	'0.1979'
\mu	'0.5766'	'0.5895'	'0.583'	'0.4472'	'0.2168'
a_H	'10.5188'	'10.7613'	'10.6401'	'10.5989'	'0.0644'
b_H	'5.3015'	'5.5999'	'5.4507'	'5.1361'	'0.0692'
\nu	'194.922'	'214.2747'	'204.5983'	'79.7503'	'0.1568'
BP	'245.9815'	'246.0186'	'246.0001'	'244.8071'	'0.0355'

7.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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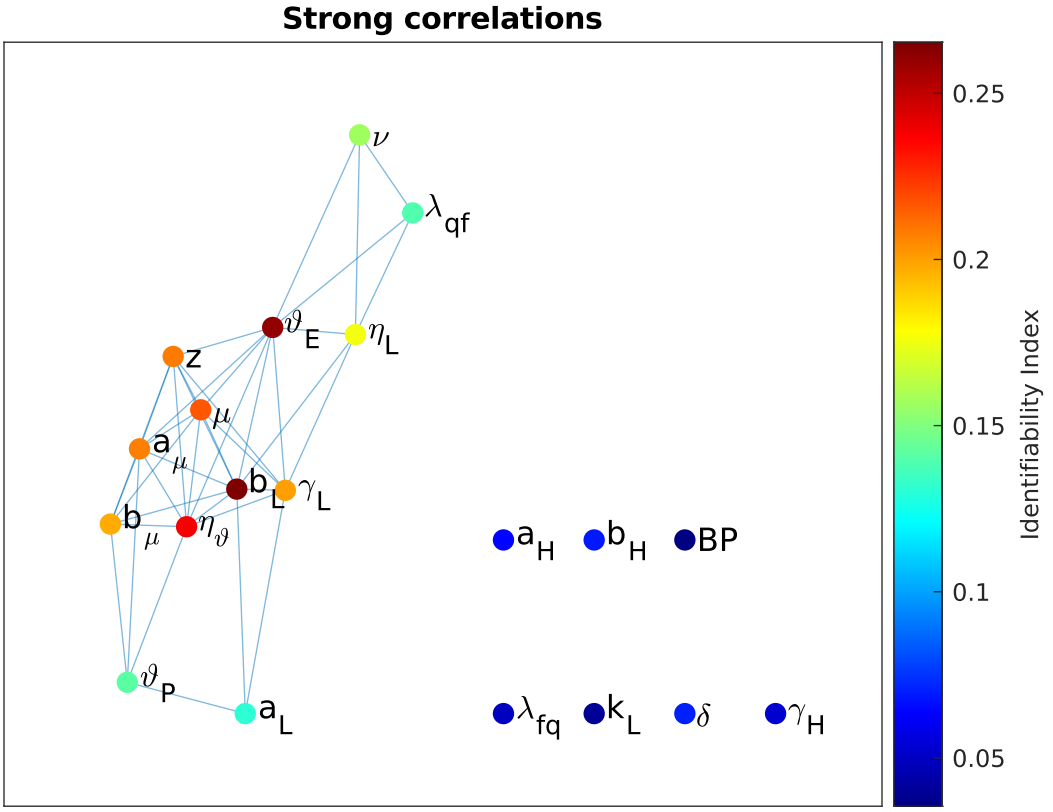
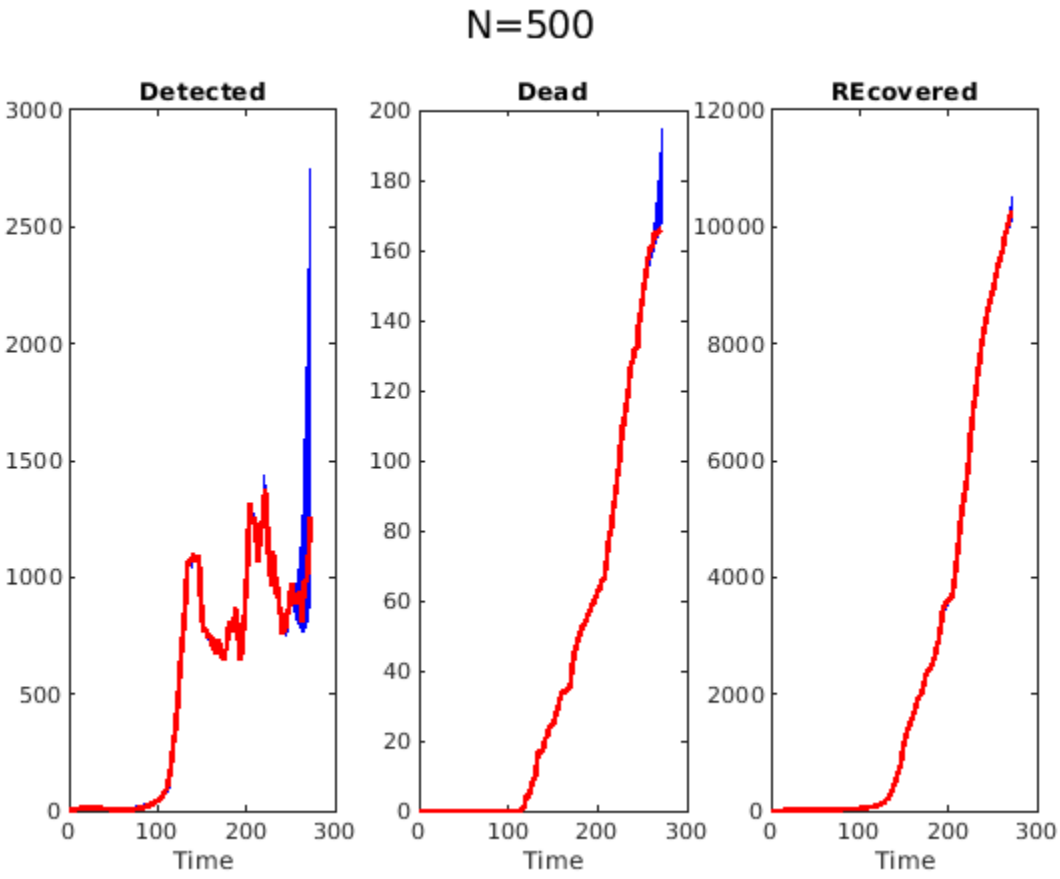
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
ν
λ_{qf}
ϑ_E
η_L
z
μ
a
μ
b
L
γ_L
b
μ
η_ϑ
ϑ_P
a_L
a_H
b_H
BP
λ_{fq}
k_L
δ
γ_H
0.25
0.2
0.15
0.1
0.05
Identifiability Index

7.4. Uncertainty analisys



Chapter 8. Extension number8

8.1. Basic information

The extension to be validated consists of the time series from the data273 to the 304. The status of the validation is: COMPLETED.

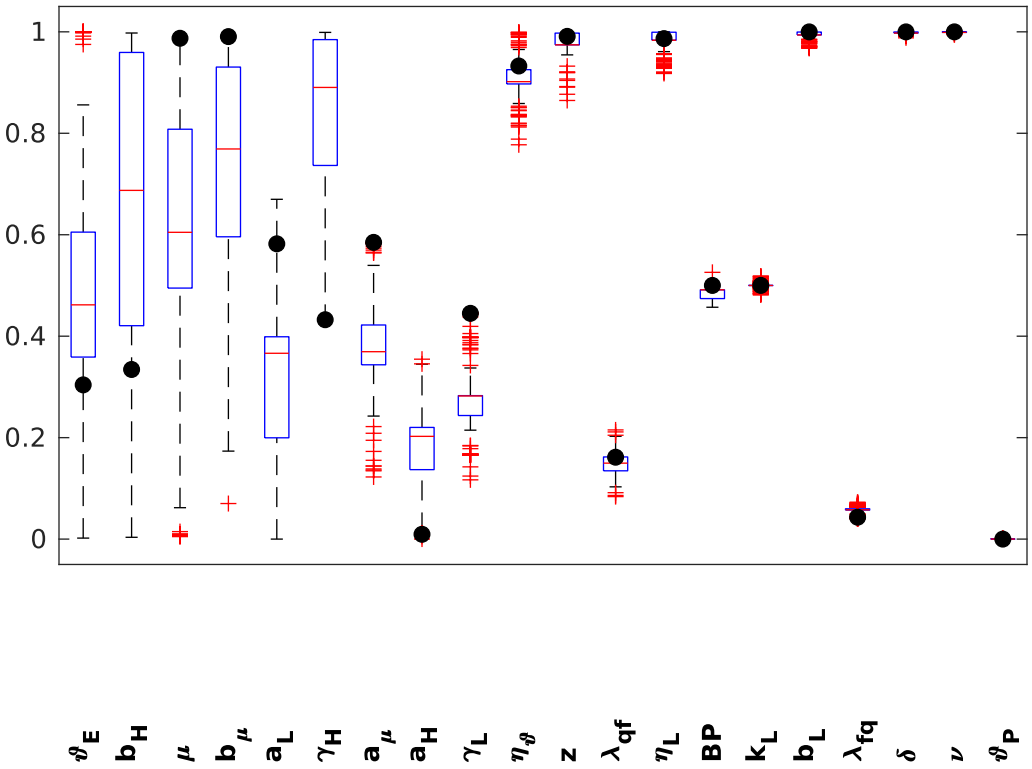
The number of estimations needed to perform the validation was1000.

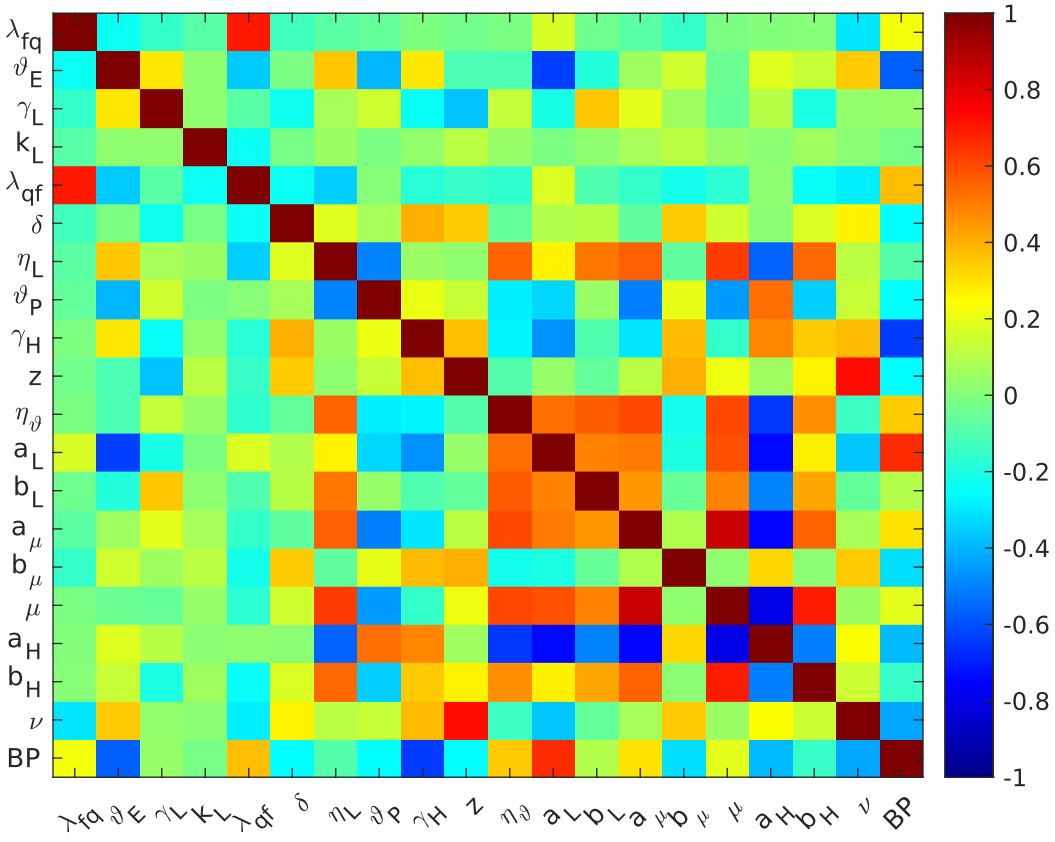
8.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0435'	'0.0719'	'0.0577'	'0.0431'	'0.0822'
\vartheta_E	'0.4269'	'0.4966'	'0.4618'	'0.304'	'0.1408'
\gamma_L	'0.2633'	'0.301'	'0.2822'	'0.4451'	'0.0812'
k_L	'5.3493'	'5.6507'	'5.5'	'5.5013'	'0.0544'
\lambda_{qf}	'0.1283'	'0.1711'	'0.1497'	'0.1614'	'0.1112'
\delta	'0.1477'	'0.15'	'0.1496'	'0.15'	'0.0725'
\eta_L	'0.9493'	'1'	'0.9835'	'0.9866'	'0.1946'
\vartheta_P	'0'	'0.0312'	'0.0001'	'0'	'0.1233'
\gamma_H	'0.863'	'0.9178'	'0.8904'	'0.4325'	'0.1311'
z	'27.8465'	'30'	'29.2301'	'29.732'	'0.1219'
\eta_\vartheta	'0.864'	'0.9395'	'0.9018'	'0.9326'	'0.2105'
a_L	'5.7576'	'6.4991'	'6.1284'	'9.1494'	'0.2107'
b_L	'14.3064'	'15'	'14.9138'	'14.9983'	'0.1328'
a_\mu	'5.8828'	'6.4611'	'6.172'	'9.1893'	'0.2115'
b_\mu	'11.3358'	'12.1983'	'11.7671'	'14.8682'	'0.1017'
\mu	'0.5584'	'0.6511'	'0.6048'	'0.9873'	'0.2241'
a_H	'3.1659'	'4.5053'	'3.8356'	'1.1326'	'0.2462'
b_H	'10.0731'	'11.1747'	'10.6239'	'5.6814'	'0.1837'
\nu	'481.9545'	'500'	'499.4248'	'499.9712'	'0.1113'
BP	'274.3955'	'274.6045'	'274.5'	'275.0041'	'0.134'

8.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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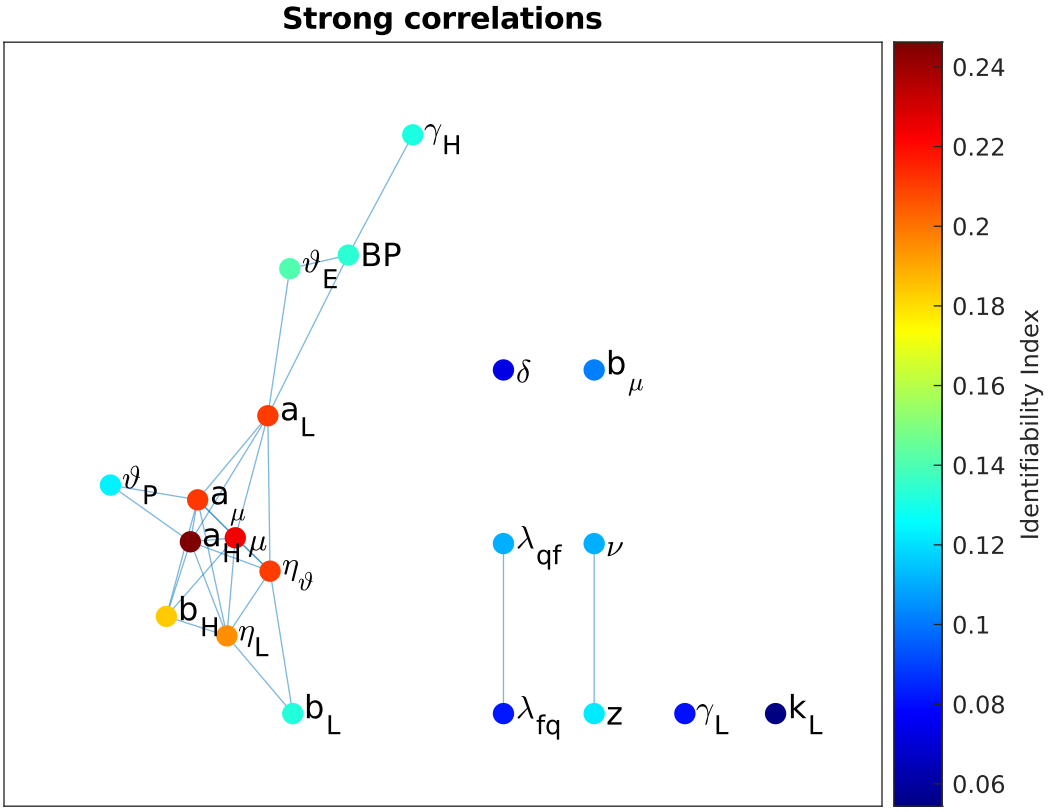
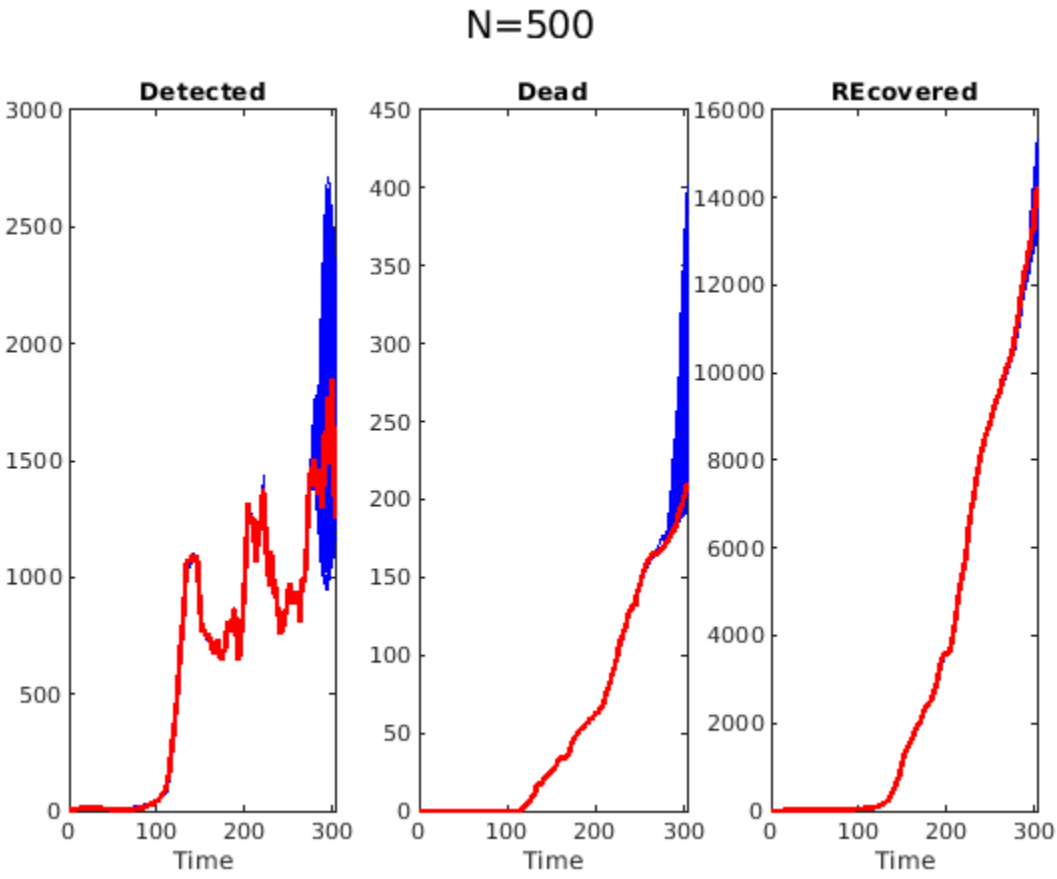
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
γ_H
ϑ_E
BP
δ
b_μ
a_L
ϑ_P
a_μ
a_H
μ
η_ϑ
λ_{qf}
ν
b_H
η_L
b_L
λ_{fq}
z
γ_L
k_L
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
Identifiability Index

8.4. Uncertainty analisys



Chapter 9. Extension number9

9.1. Basic information

The extension to be validated consists of the time series from the data330 to the 330. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

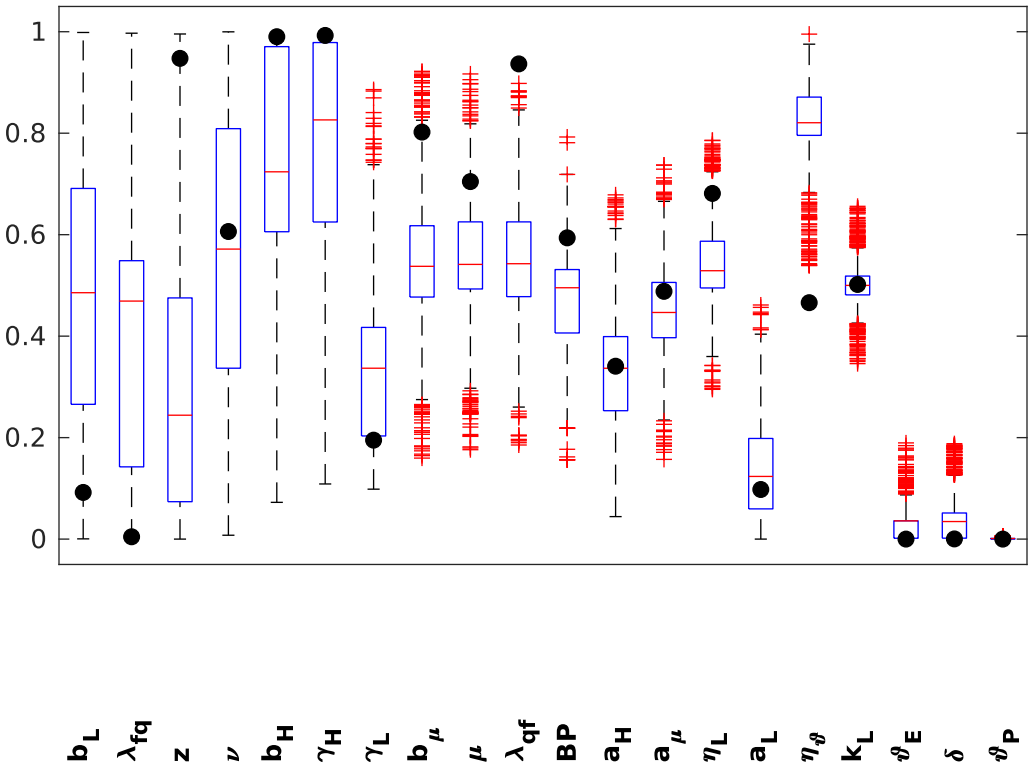
9.2. Estimated parameters with their intervals

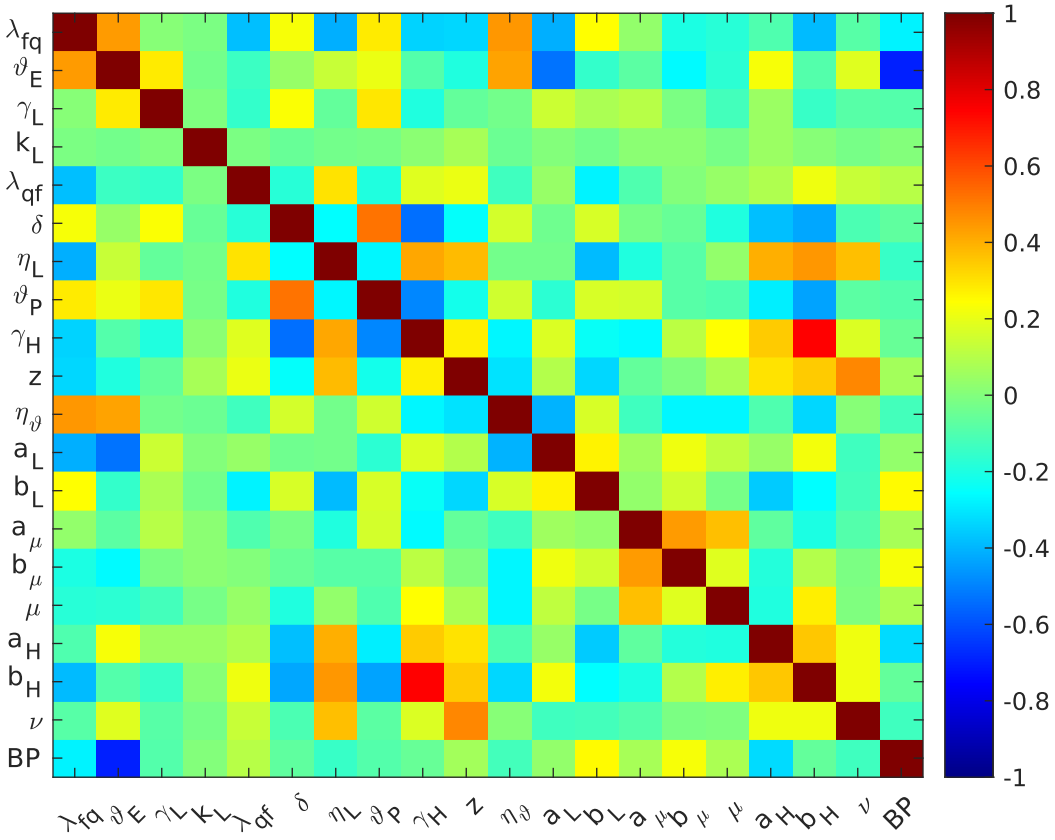
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0046'	'0.0046'	'0.4691'	'0.0046'	'0.1077'
\vartheta_E	'0'	'0.0001'	'0.0361'	'0'	'0.1217'
\gamma_L	'0.1365'	'0.2925'	'0.3372'	'0.195'	'0.07'
k_L	'3.8617'	'8.2751'	'5.5003'	'5.5168'	'0.0411'
\lambda_{qf}	'0.6556'	'1'	'0.5428'	'0.9366'	'0.0748'
\delta	'0'	'0.0001'	'0.0052'	'0.0001'	'0.1113'
\eta_L	'0.4769'	'1'	'0.529'	'0.6813'	'0.094'
\vartheta_P	'0'	'0'	'0.0011'	'0'	'0.0906'
\gamma_H	'0.6949'	'1'	'0.8262'	'0.9927'	'0.133'
z	'19.8972'	'30'	'7.3253'	'28.4245'	'0.0988'
\eta_\vartheta	'0.3262'	'0.6989'	'0.8206'	'0.466'	'0.0864'
a_L	'1.6581'	'3.5531'	'2.7301'	'2.3687'	'0.0893'
b_L	'1.6014'	'3.4315'	'7.7986'	'2.2877'	'0.0938'
a_\mu	'5.4853'	'11.7542'	'7.2531'	'7.8361'	'0.0676'
b_\mu	'8.5612'	'15'	'8.5268'	'12.2303'	'0.0749'
\mu	'0.4932'	'1'	'0.5414'	'0.7046'	'0.0748'
a_H	'4.0394'	'8.6558'	'5.7206'	'5.7705'	'0.0875'
b_H	'10.4035'	'15'	'11.1345'	'14.8621'	'0.1204'
\nu	'212.1769'	'454.6647'	'285.7868'	'303.1098'	'0.0824'
BP	'304'	'320'	'311.9218'	'313.5'	'0.084'

9.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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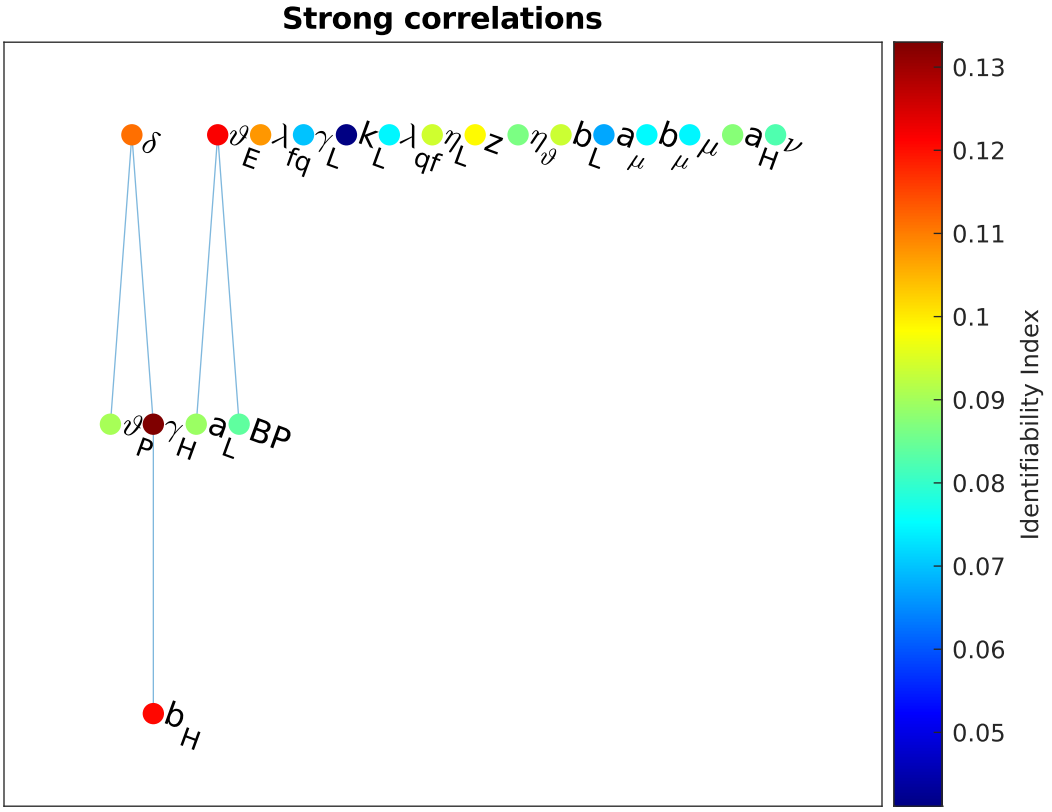
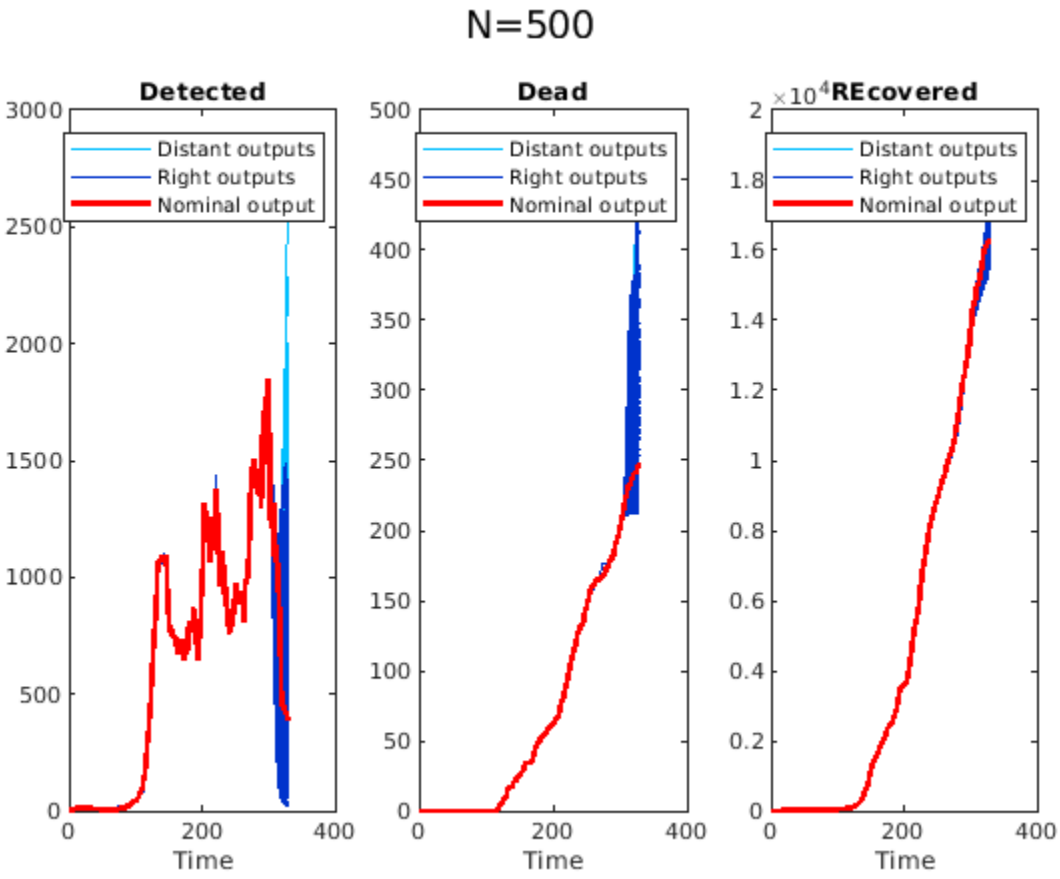
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05

9.4. Uncertainty analisys



Chapter 10. Extension number10

10.1. Basic information

The extension to be validated consists of the time series from the data330 to the 400. The status of the validation is: COMPLETED.

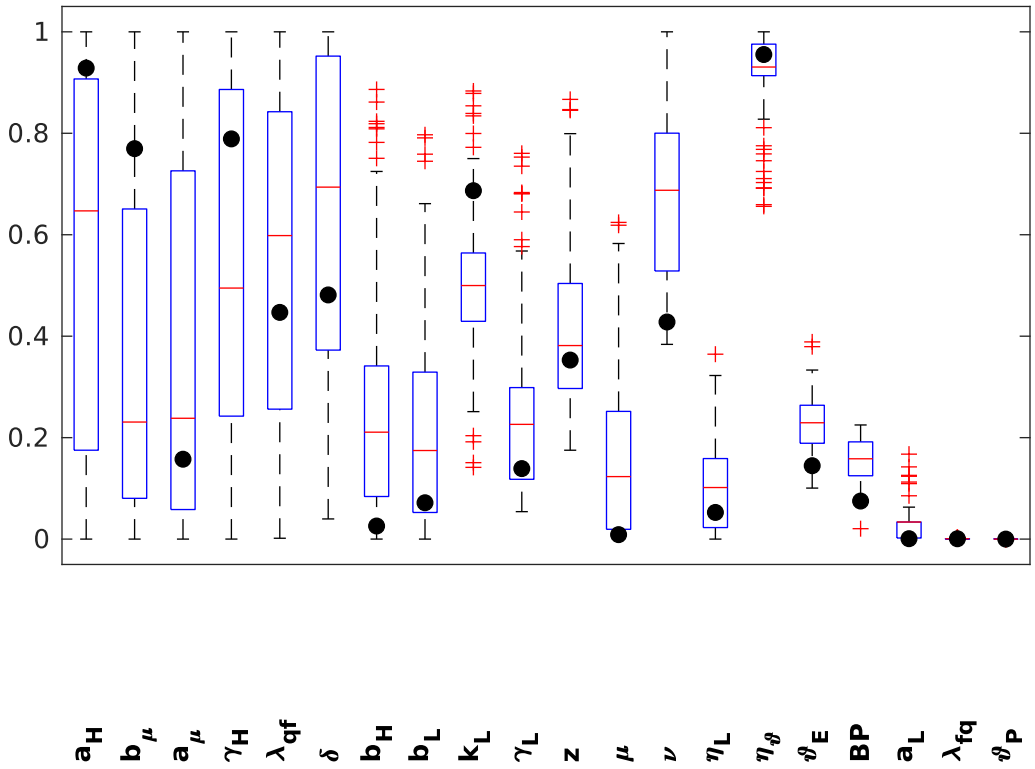
The number of estimations needed to perform the validation was1000.

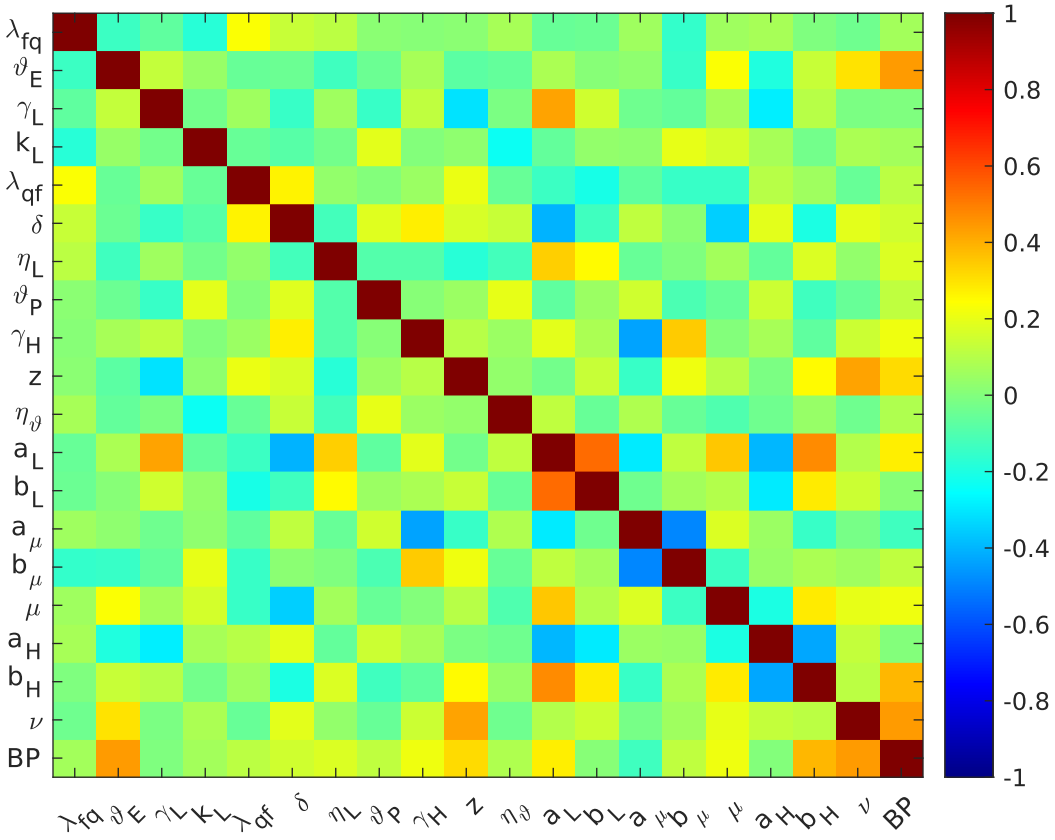
10.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0238'	'0.0006'	'0.0007'	'0.056'
\vartheta_E	'0.2153'	'0.2434'	'0.2293'	'0.1447'	'0.0687'
\gamma_L	'0.1526'	'0.2997'	'0.2262'	'0.139'	'0.1261'
k_L	'5.0761'	'5.9212'	'5.4986'	'7.1815'	'0.0919'
\lambda_{qf}	'0.5244'	'0.6723'	'0.5983'	'0.4469'	'0.1245'
\delta	'0.093'	'0.1151'	'0.1041'	'0.0722'	'0.14'
\eta_L	'0.0515'	'0.1519'	'0.1017'	'0.0526'	'0.1016'
\vartheta_P	'0'	'0'	'0'	'0'	'0.0477'
\gamma_H	'0.4147'	'0.5751'	'0.4949'	'0.7889'	'0.1347'
z	'9.9811'	'12.9113'	'11.4462'	'10.5883'	'0.1091'
\eta_\vartheta	'0.8875'	'0.9737'	'0.9306'	'0.9553'	'0.0876'
a_L	'1'	'2.7228'	'1.4716'	'1.0113'	'0.1548'
b_L	'2.6269'	'4.2626'	'3.4448'	'2.0031'	'0.1288'
a_\mu	'3.1734'	'5.4962'	'4.3348'	'3.2048'	'0.1397'
b_\mu	'3.1124'	'5.3489'	'4.2307'	'11.7757'	'0.1366'
\mu	'0.0602'	'0.1863'	'0.1232'	'0.0088'	'0.1256'
a_H	'8.867'	'11.2498'	'10.0584'	'13.9994'	'0.1446'
b_H	'3.0022'	'4.8999'	'3.951'	'1.361'	'0.1352'
\nu	'323.6471'	'364.0089'	'343.828'	'214.0035'	'0.0977'
BP	'338.9044'	'340.0955'	'339.5'	'334.5'	'0.0765'

10.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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0.6
0.4
0.2
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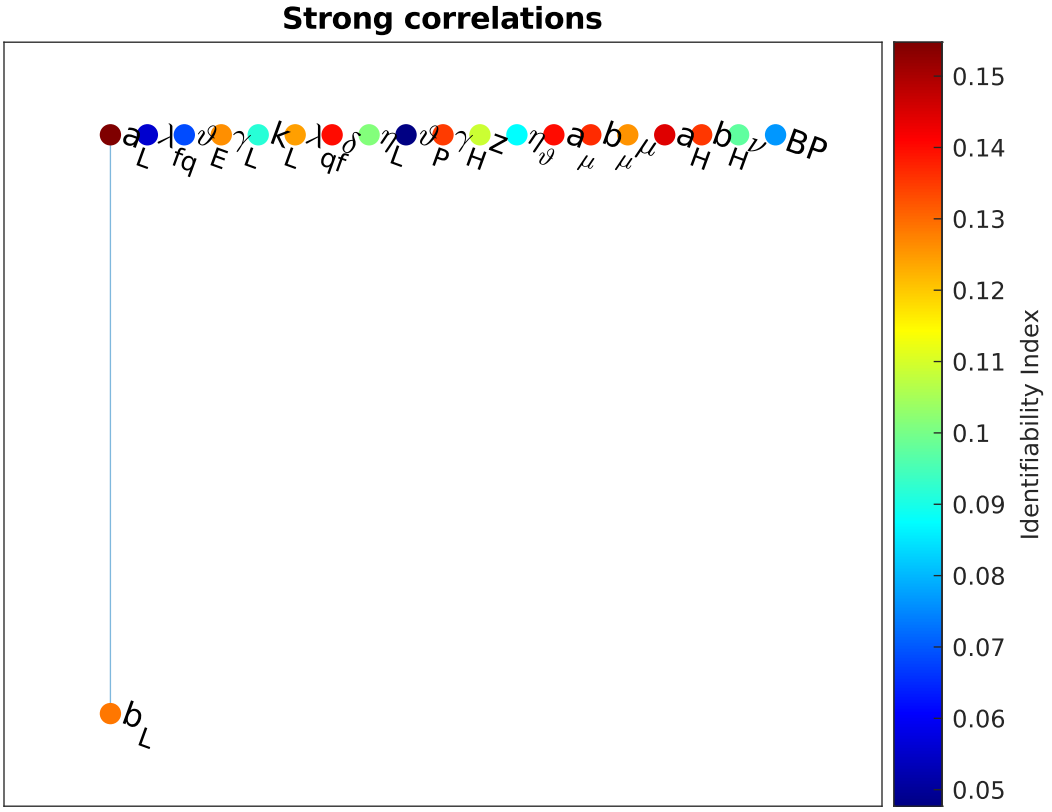
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.15
0.14
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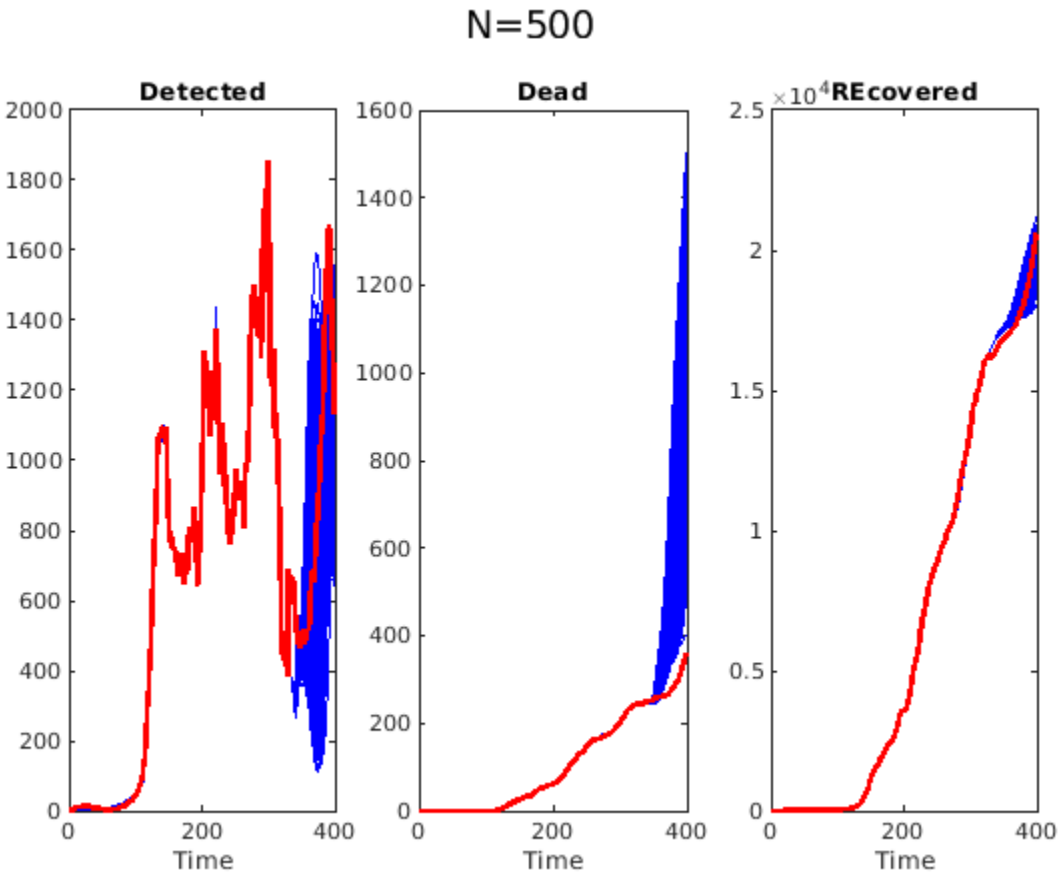
0.1
0.09
0.08
0.07
0.06
0.05

10.4. Uncertainty analisys



Chapter 11. Extension number11

11.1. Basic information

The extension to be validated consists of the time series from the data400 to the 430. The status of the validation is: COMPLETED.

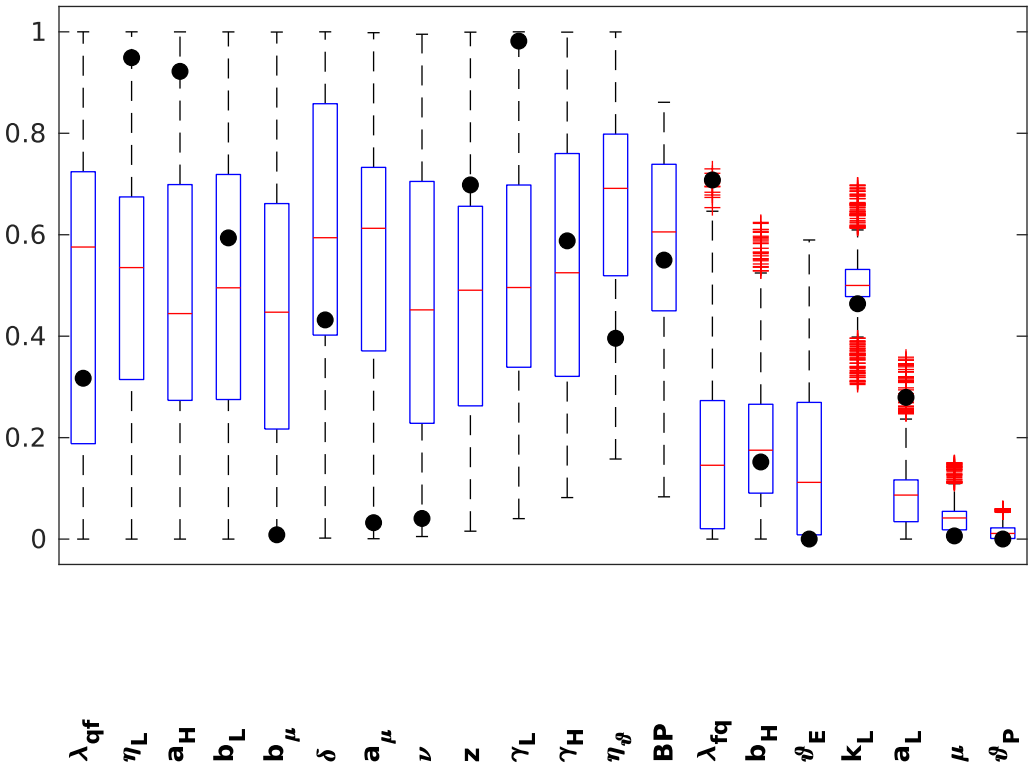
The number of estimations needed to perform the validation was1000.

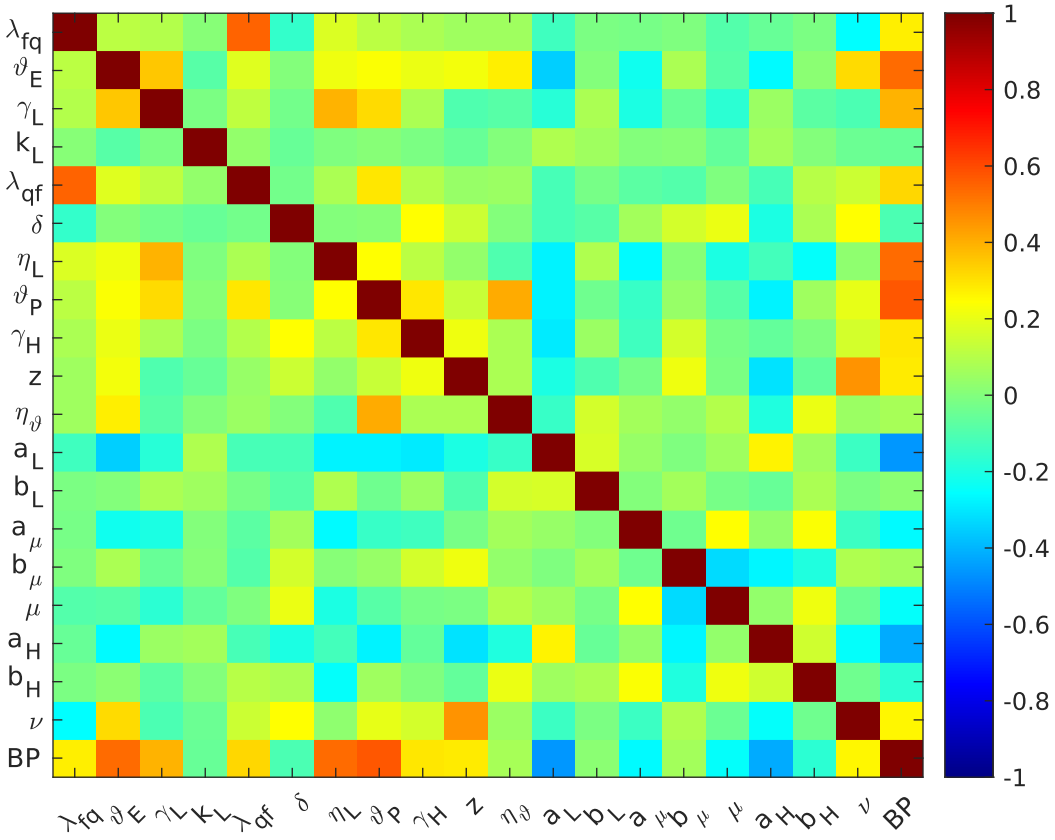
11.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.123'	'0.1681'	'0.1456'	'0.708'	'0.0884'
\vartheta_E	'0.095'	'0.1287'	'0.1118'	'0.0001'	'0.1016'
\gamma_L	'0.4734'	'0.5185'	'0.496'	'0.9818'	'0.0839'
k_L	'5.3944'	'5.6058'	'5.5001'	'5.1756'	'0.045'
\lambda_{qf}	'0.5474'	'0.6041'	'0.5758'	'0.3171'	'0.0972'
\delta	'0.0854'	'0.0929'	'0.0891'	'0.0648'	'0.0741'
\eta_L	'0.5103'	'0.5602'	'0.5352'	'0.9491'	'0.1018'
\vartheta_P	'0.0086'	'0.0137'	'0.0112'	'0.0001'	'0.0871'
\gamma_H	'0.5011'	'0.549'	'0.525'	'0.588'	'0.0814'
z	'14.0003'	'15.4379'	'14.7191'	'20.9463'	'0.0829'
\eta_\vartheta	'0.6728'	'0.71'	'0.6914'	'0.3959'	'0.071'
a_L	'1.9612'	'2.4686'	'2.2149'	'4.9111'	'0.085'
b_L	'7.5838'	'8.2869'	'7.9354'	'9.3134'	'0.0642'
a_\mu	'9.2539'	'9.9011'	'9.5775'	'1.4527'	'0.0756'
b_\mu	'6.9089'	'7.6157'	'7.2623'	'1.119'	'0.074'
\mu	'0.0305'	'0.0528'	'0.0417'	'0.0063'	'0.064'
a_H	'6.8709'	'7.5768'	'7.2239'	'13.9089'	'0.0899'
b_H	'3.1994'	'3.7075'	'3.4535'	'3.1286'	'0.0684'
\nu	'213.8975'	'237.9725'	'225.935'	'20.345'	'0.0861'
BP	'383.096'	'385.904'	'384.5'	'379.4996'	'0.1449'

11.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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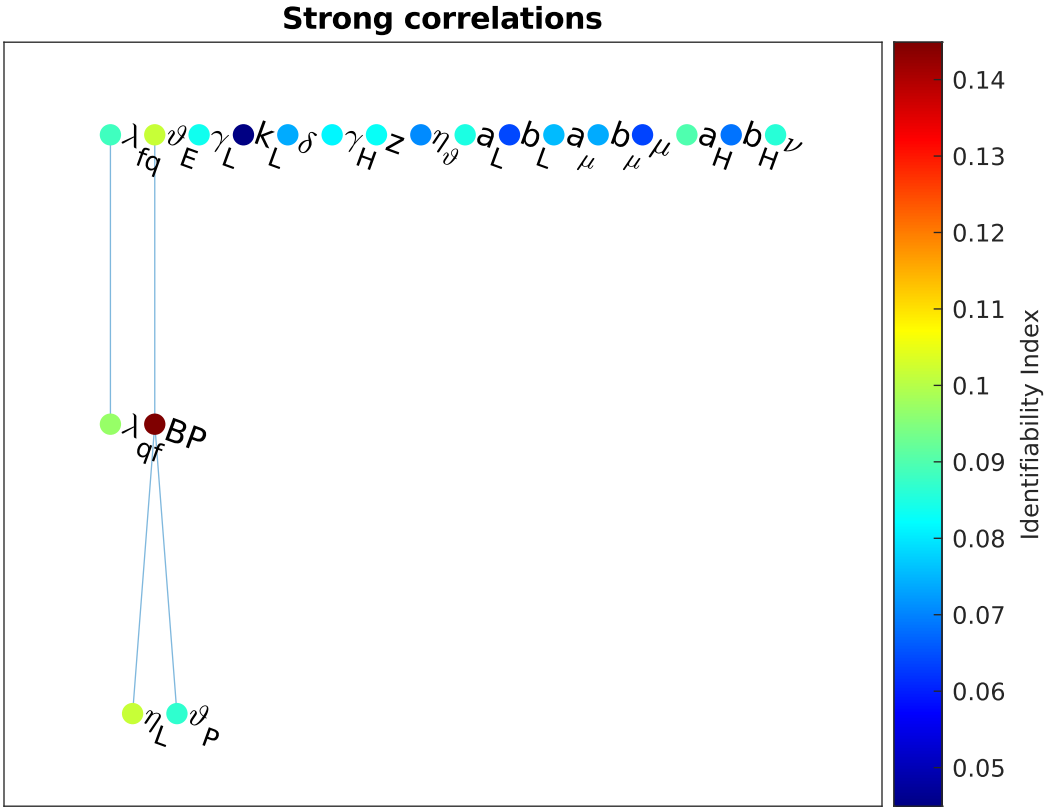
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.14
0.13
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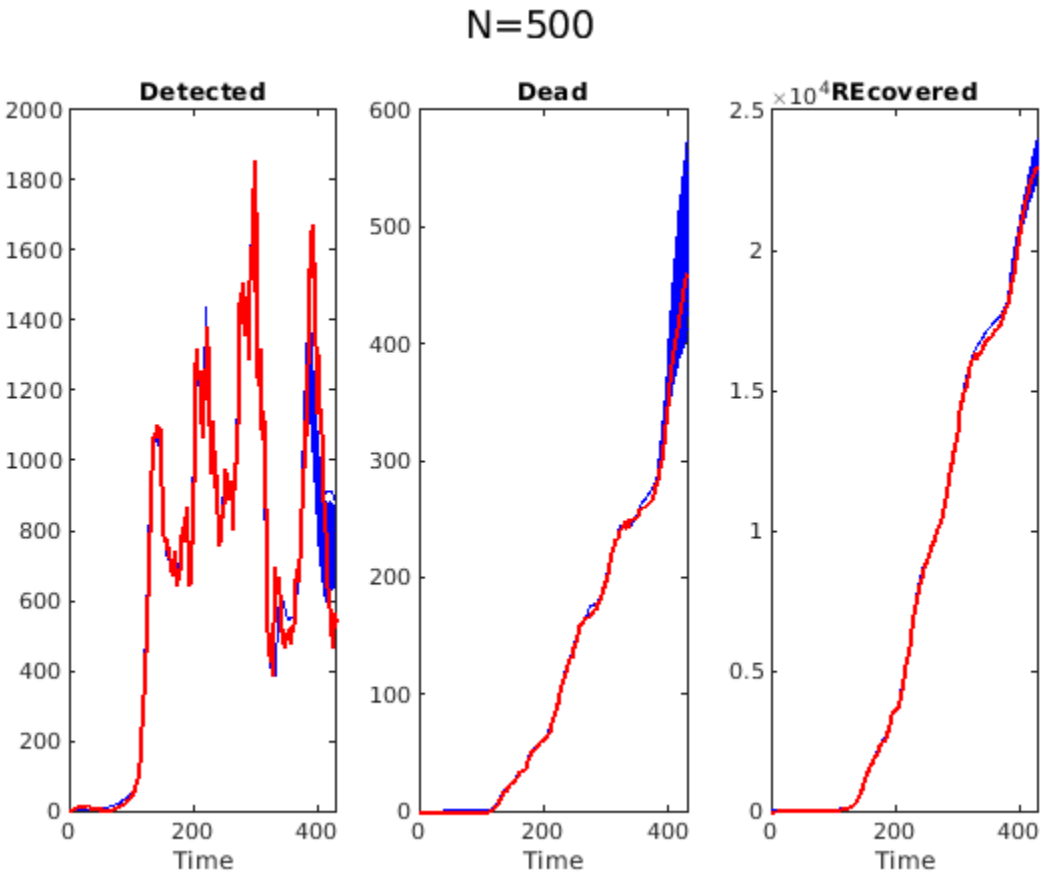
0.11
0.1
0.09
0.08
0.07
0.06
0.05

11.4. Uncertainty analisys



Chapter 12. Extension number12

12.1. Basic information

The extension to be validated consists of the time series from the data430 to the 487. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

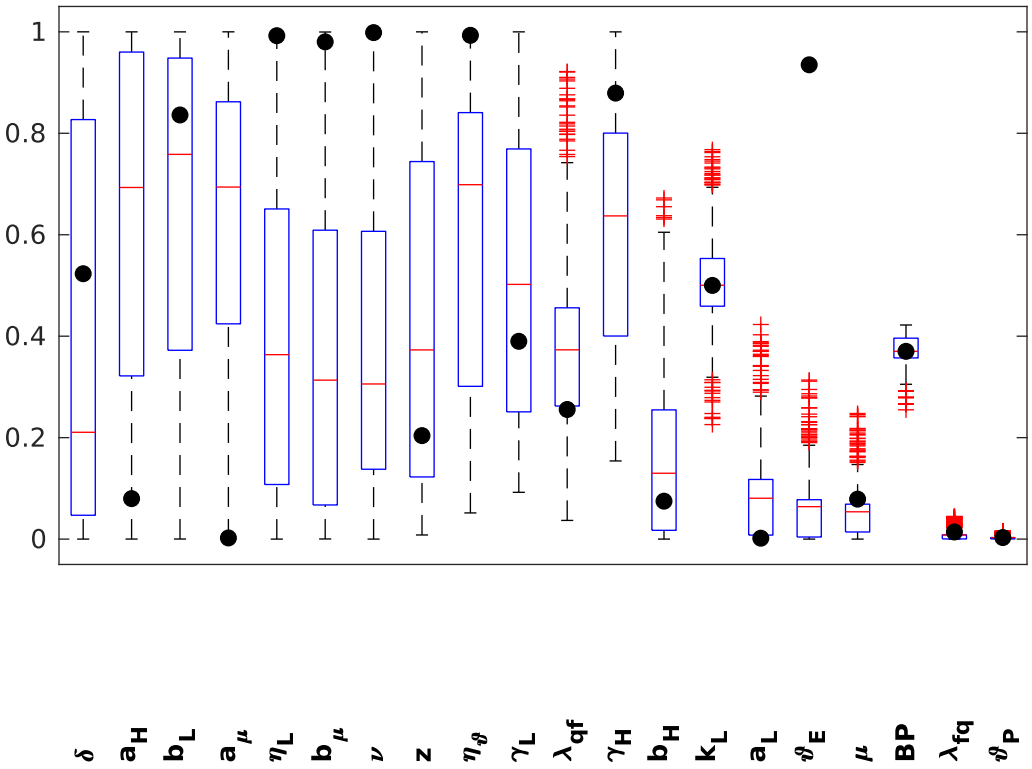
12.2. Estimated parameters with their intervals

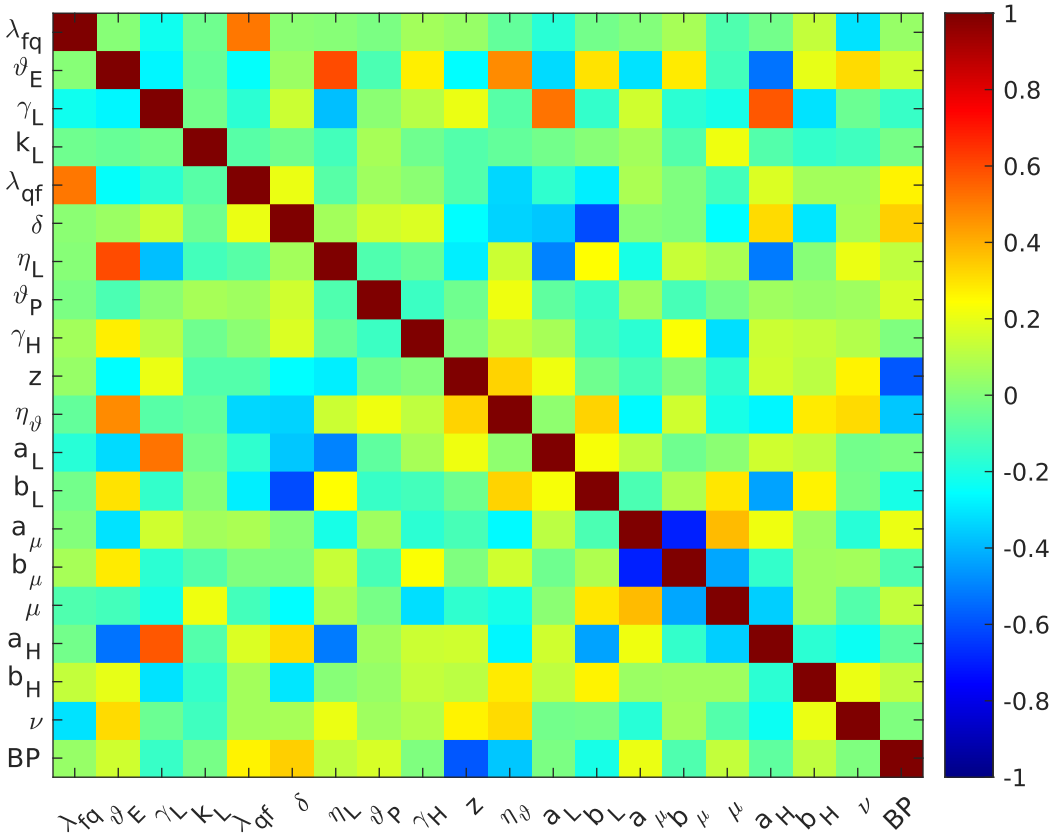
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0042'	'0.0317'	'0.0082'	'0.0141'	'0.0799'
\vartheta_E	'0.8454'	'0.94'	'0.064'	'0.935'	'0.1455'
\gamma_L	'0.3835'	'0.5985'	'0.5021'	'0.3899'	'0.1305'
k_L	'1'	'10'	'5.5042'	'5.5008'	'0.0601'
\lambda_{qf}	'0.2218'	'0.5534'	'0.3731'	'0.2555'	'0.1056'
\delta	'0.0027'	'0.1131'	'0.0316'	'0.0785'	'0.1299'
\eta_L	'0.5414'	'1'	'0.3636'	'0.9924'	'0.136'
\vartheta_P	'0'	'0.0059'	'0.0029'	'0.003'	'0.0488'
\gamma_H	'0.2987'	'1'	'0.6371'	'0.8792'	'0.0814'
z	'5.6267'	'11.2005'	'11.1883'	'6.1199'	'0.1189'
\eta_\vartheta	'0.608'	'1'	'0.6986'	'0.9931'	'0.1145'
a_L	'1.0151'	'1.5787'	'2.1281'	'1.0249'	'0.1074'
b_L	'9.3586'	'15'	'11.618'	'12.7054'	'0.1215'
a_\mu	'1'	'11.206'	'10.716'	'1.0321'	'0.1164'
b_\mu	'2.4'	'15'	'5.3868'	'14.7235'	'0.1101'
\mu	'0.0156'	'0.0798'	'0.0538'	'0.0788'	'0.0961'
a_H	'1.63'	'12.11'	'10.7042'	'2.1168'	'0.1604'
b_H	'1.951'	'12.4964'	'2.8175'	'2.0464'	'0.0861'
\nu	'398.2723'	'500'	'152.9033'	'499.2192'	'0.093'
BP	'426.3215'	'433.9622'	'428.5'	'428.5'	'0.085'

12.3. Identifiability analisys




λfq
ϑE
γL
kL
λqf
δ
ηL
ϑP
γH
z
ηϑ
aL
bL
aμ
bμ
μ
aH
bH
ν
BP
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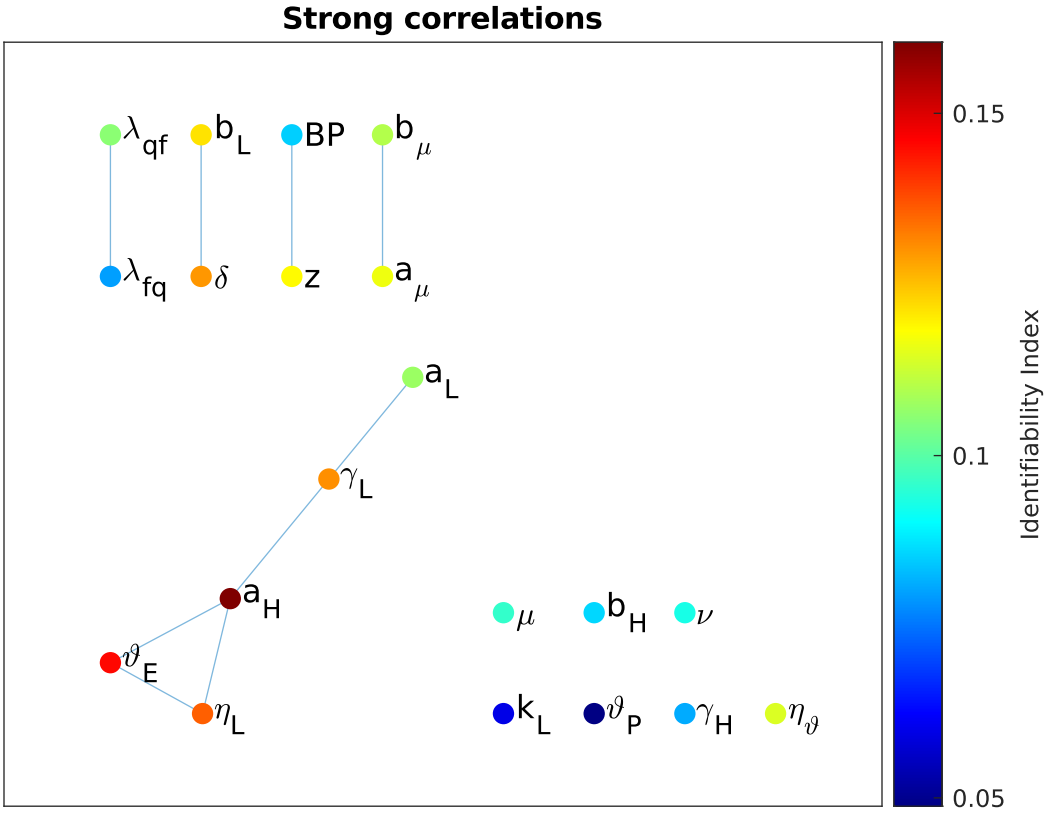
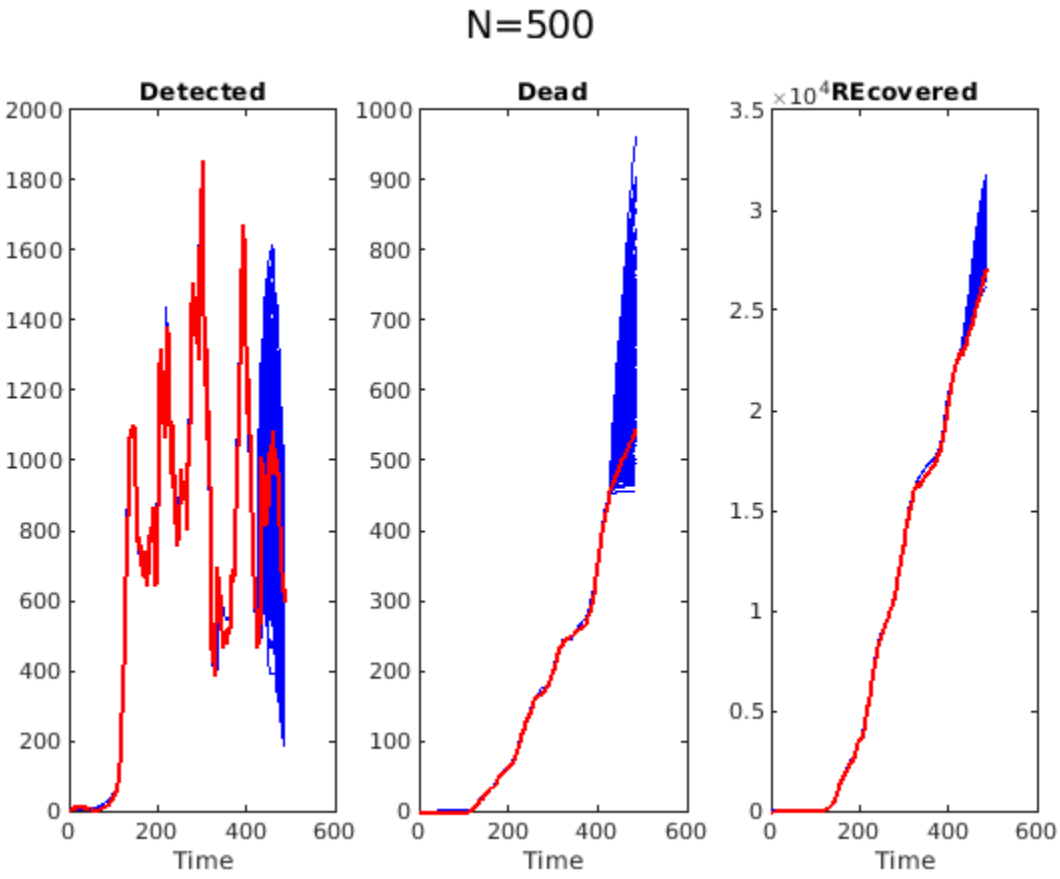
-0.4
-0.6
-0.8
-1


Strong correlations
λ_{qf}
b_L
BP
b_μ
λ_{fq}
δ
z
a_μ
a_L
γ_L
a_H
ϑ_E
η_L
μ
b_H
ν
k_L
ϑ_P
γ_H
η_ϑ
0.15
0.1
0.05
Identifiability Index

12.4. Uncertainty analisys



Chapter 13. Extension number13

13.1. Basic information

The extension to be validated consists of the time series from the data487 to the 714. The status of the validation is: COMPLETED.

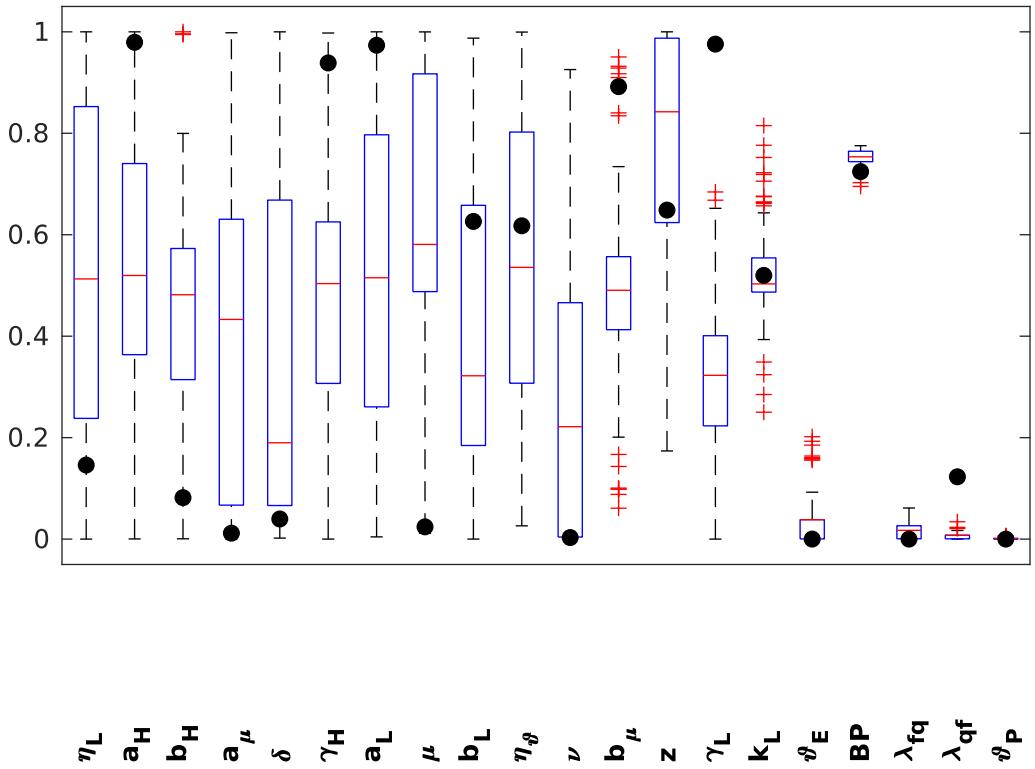
The number of estimations needed to perform the validation was1000.

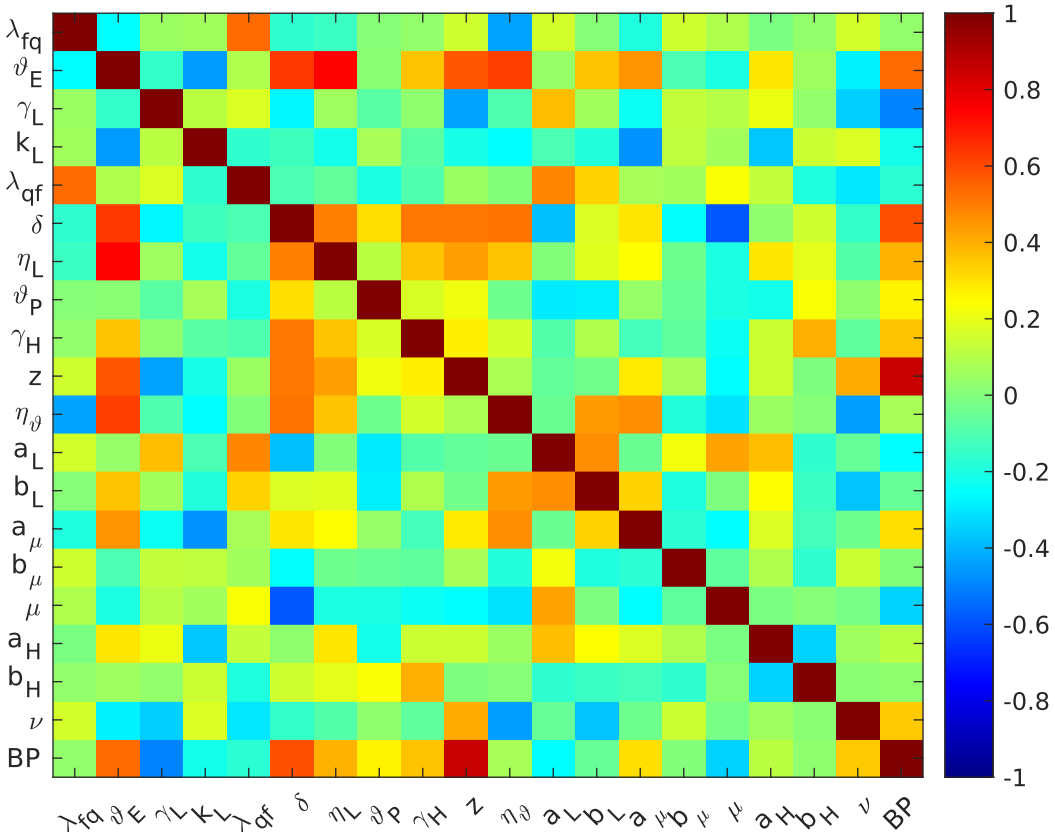
13.2. Estimated parameters with their intervals

It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0979'	'0.0173'	'0'	'0.1198'
\vartheta_E	'0'	'0.1248'	'0.0383'	'0.0001'	'0.2278'
\gamma_L	'0.2655'	'0.3802'	'0.3229'	'0.9758'	'0.1256'
k_L	'5.0442'	'6.0113'	'5.5278'	'5.6793'	'0.1235'
\lambda_{qf}	'0'	'0.1145'	'0.0076'	'0.1228'	'0.1379'
\delta	'0.015'	'0.0419'	'0.0285'	'0.0059'	'0.2676'
\eta_L	'0.4314'	'0.5944'	'0.5129'	'0.146'	'0.1764'
\vartheta_P	'0'	'0.0256'	'0.0013'	'0'	'0.0735'
\gamma_H	'0.4378'	'0.5696'	'0.5037'	'0.9387'	'0.1491'
z	'22.9137'	'27.6299'	'25.2718'	'19.458'	'0.2043'
\eta_\vartheta	'0.4653'	'0.6059'	'0.5356'	'0.6176'	'0.1778'
a_L	'7.1224'	'9.3026'	'8.2125'	'14.6296'	'0.1532'
b_L	'4.522'	'6.4931'	'5.5075'	'9.7672'	'0.1446'
a_\mu	'5.9971'	'8.1287'	'7.0629'	'1.1635'	'0.155'
b_\mu	'7.0383'	'8.696'	'7.8671'	'13.4875'	'0.1128'
\mu	'0.5085'	'0.6533'	'0.5809'	'0.0242'	'0.1549'
a_H	'7.3567'	'9.1934'	'8.2751'	'14.7113'	'0.1316'
b_H	'6.9419'	'8.5466'	'7.7442'	'2.1439'	'0.1129'
\nu	'76.7756'	'144.8156'	'110.7956'	'1.5233'	'0.1367'
BP	'633.8546'	'639.1454'	'636.5'	'628.5'	'0.1403'

13.3. Identifiability analisys




λ_{fq}
ϑ_E
γ_L
k_L
λ_{qf}
δ
η_L
ϑ_P
γ_H
z
η_ϑ
a_L
b_L
a_μ
b_μ
μ
a_H
b_H
ν
BP
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0.2
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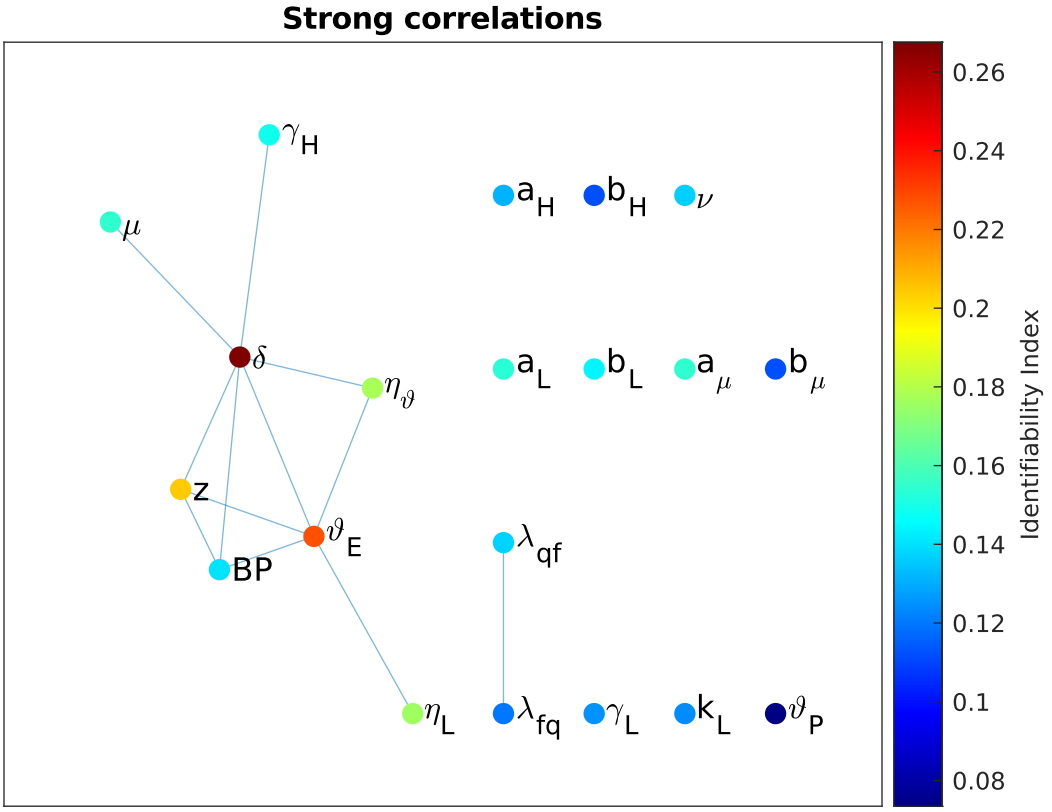
-0.4
-0.6
-0.8
-1


Strong correlations
γ_H
μ
a_H
b_H
ν
δ
a_L
b_L
a_μ
b_μ
η_ϑ
z
ϑ_E
λ_{qf}
BP
η_L
λ_{fq}
γ_L
k_L
ϑ_P
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0.18
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0.14
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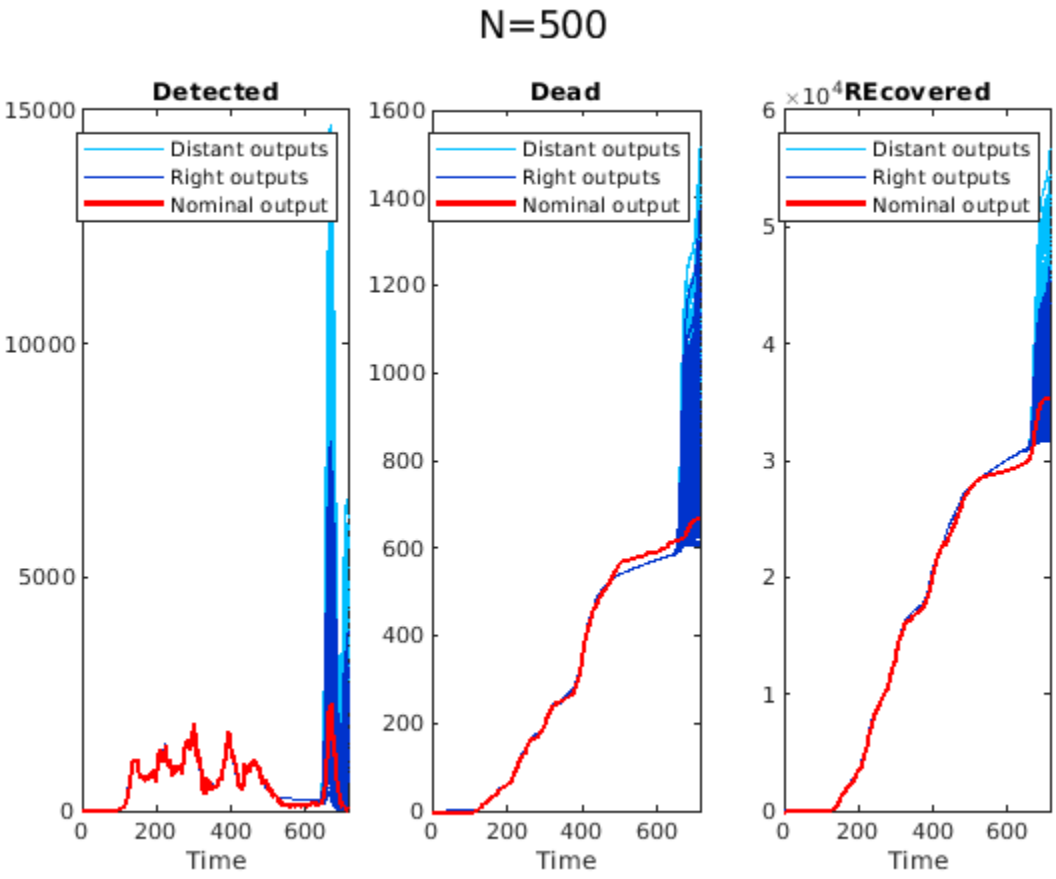
0.08
Identifiability Index

13.4. Uncertainty analisys