Validation process for05_Valle_Aburra

The epidemiology research group, EAFIT

06-Apr-2022

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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 153. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

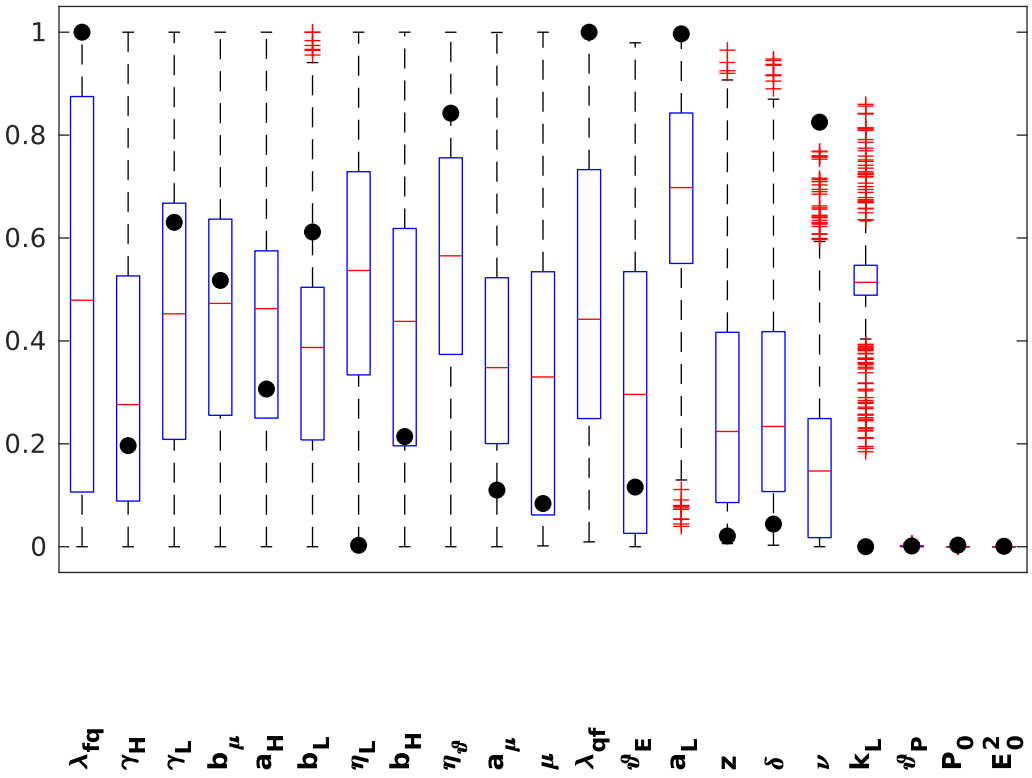
1.2. Estimated parameters with their intervals

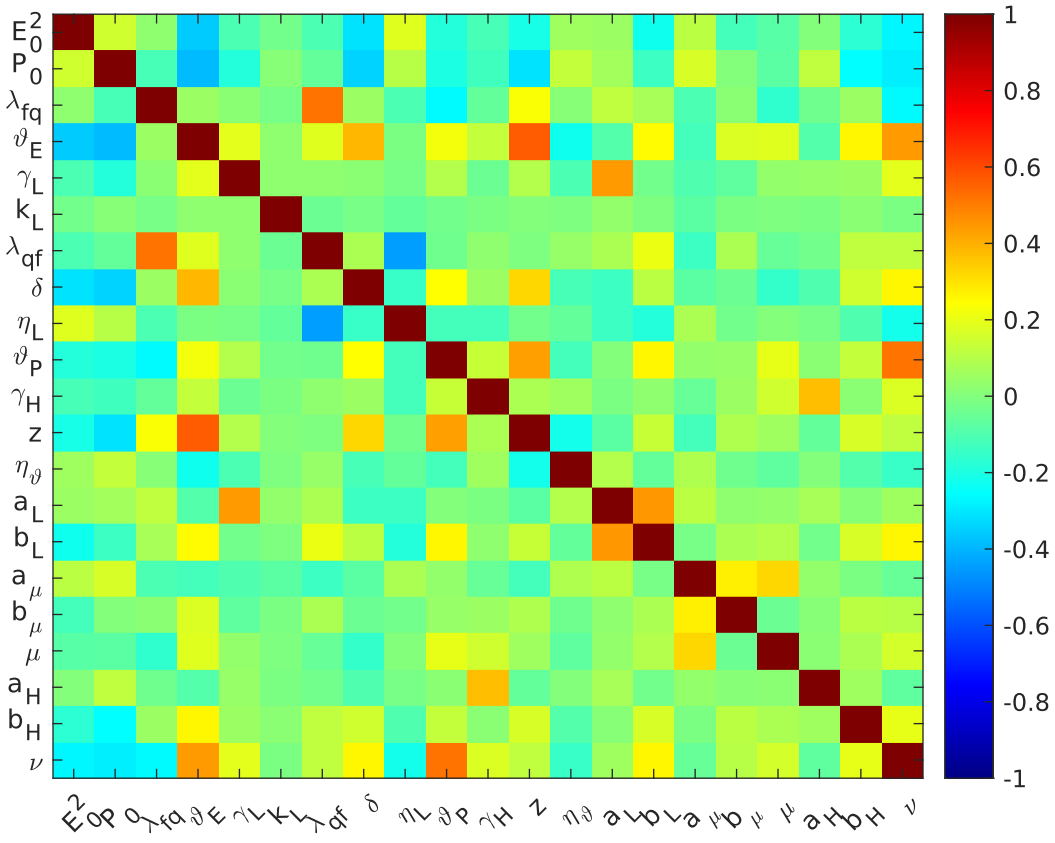
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

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

	Rango		Nominal	Mejor	Index
E^2_0	'1.7779'	'2.7128'	'0.2617'	'1.8896'	'0.0583'
P_0	'1.2243'	'1.7503'	'0.0626'	'1.2555'	'0.0632'
\lambda_{fq}	'0.9997'	'1'	'0.4791'	'1'	'0.1128'
\vartheta_E	'0.1042'	'0.1421'	'0.296'	'0.116'	'0.1244'
\gamma_L	'0.4333'	'0.8108'	'0.4527'	'0.6304'	'0.083'
k_L	'1'	'8.29'	'5.6251'	'1.0004'	'0.0601'
\lambda_{qf}	'1'	'1'	'0.4422'	'1'	'0.1044'
\delta	'0.0058'	'0.0069'	'0.0351'	'0.0066'	'0.0957'
\eta_L	'0.0023'	'0.0083'	'0.5369'	'0.0028'	'0.0871'
\vartheta_P	'0.0009'	'0.0027'	'0.0017'	'0.0015'	'0.0933'
\gamma_H	'0.0268'	'0.3661'	'0.2763'	'0.1965'	'0.0814'
z	'0.6125'	'0.6286'	'6.7195'	'0.6271'	'0.1081'
\eta_\vartheta	'0.8215'	'0.9911'	'0.5654'	'0.8426'	'0.0773'
a_L	'13.5668'	'15'	'10.7725'	'14.9549'	'0.082'
b_L	'7.9373'	'9.6665'	'6.4213'	'9.5642'	'0.0872'
a_\mu	'1.5117'	'3.4588'	'5.8734'	'2.5412'	'0.0797'
b_\mu	'5.604'	'14.0388'	'7.6213'	'8.2463'	'0.0767'
\mu	'0.0773'	'0.1153'	'0.33'	'0.084'	'0.0836'
a_H	'5.0009'	'13.4936'	'7.4787'	'5.2914'	'0.072'
b_H	'1'	'12.34'	'7.1314'	'3.9988'	'0.0879'
\nu	'231.2605'	'450.0362'	'73.6032'	'412.5573'	'0.1251'

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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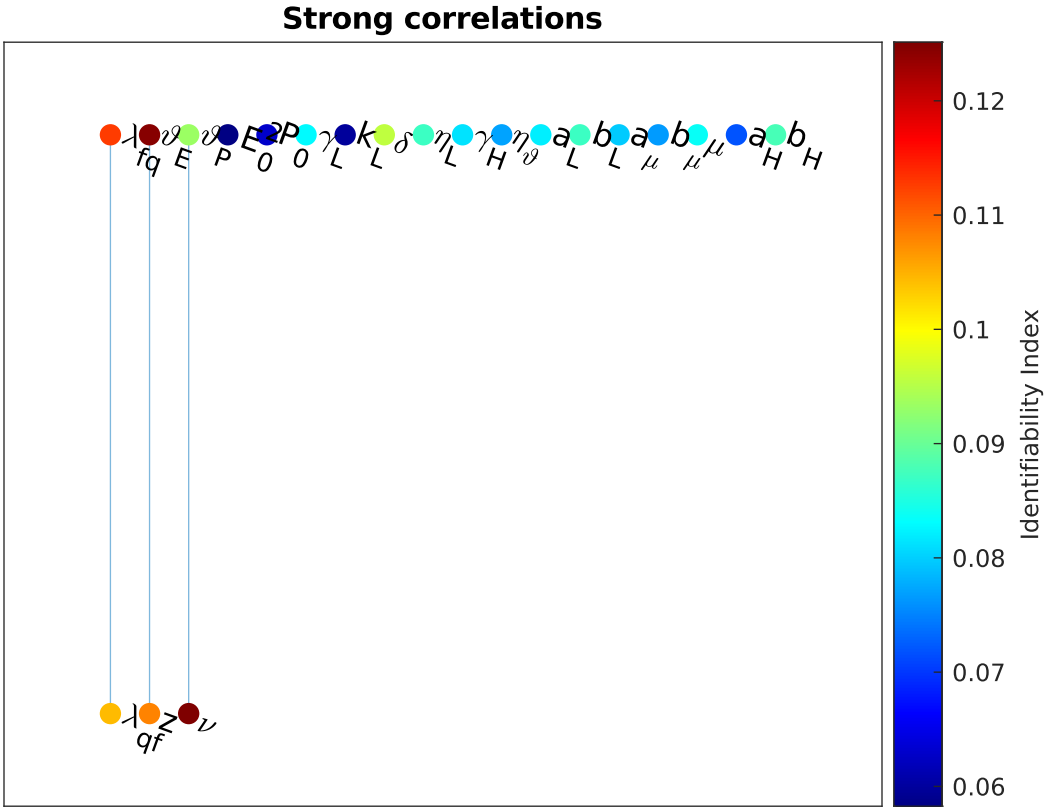
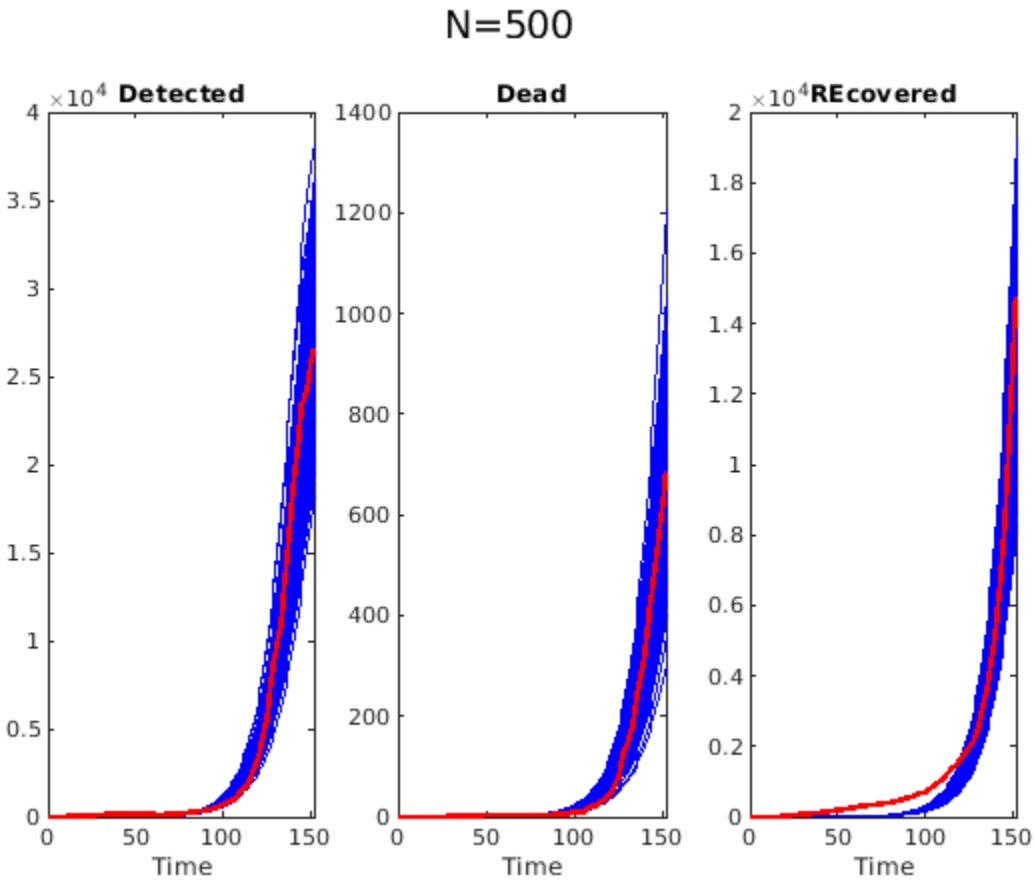
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
0.12
0.11
0.1
0.09
0.08
0.07
0.06
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 data153 to the 191. The status of the validation is: COMPLETED.

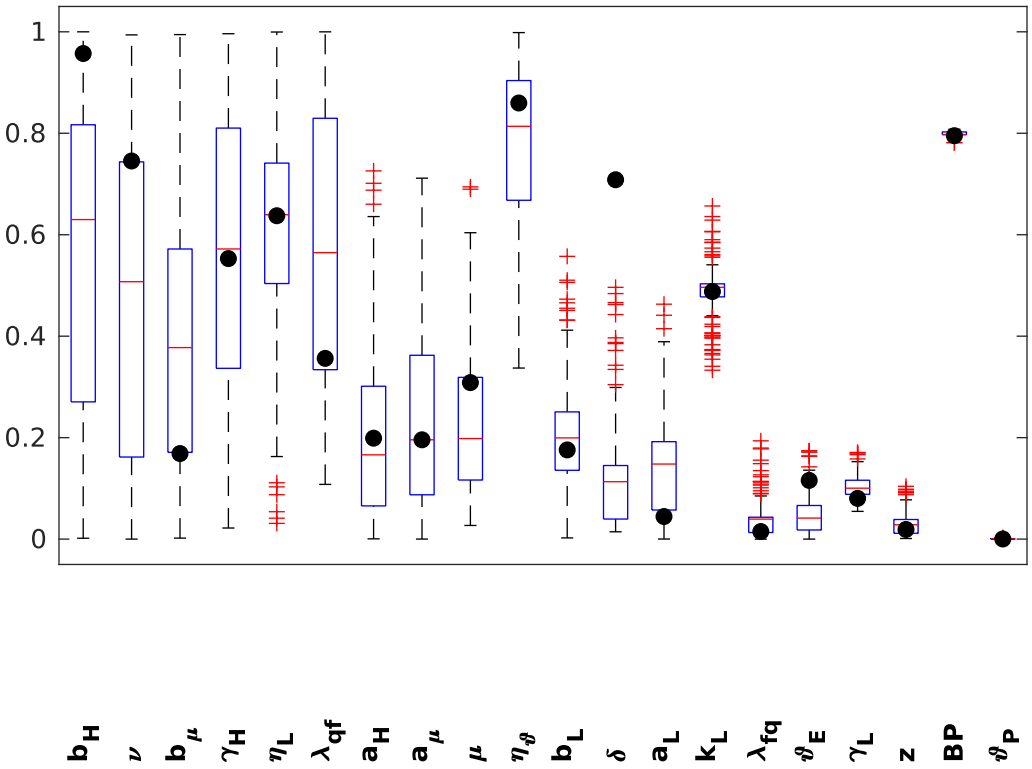
The number of estimations needed to perform the validation was1000.

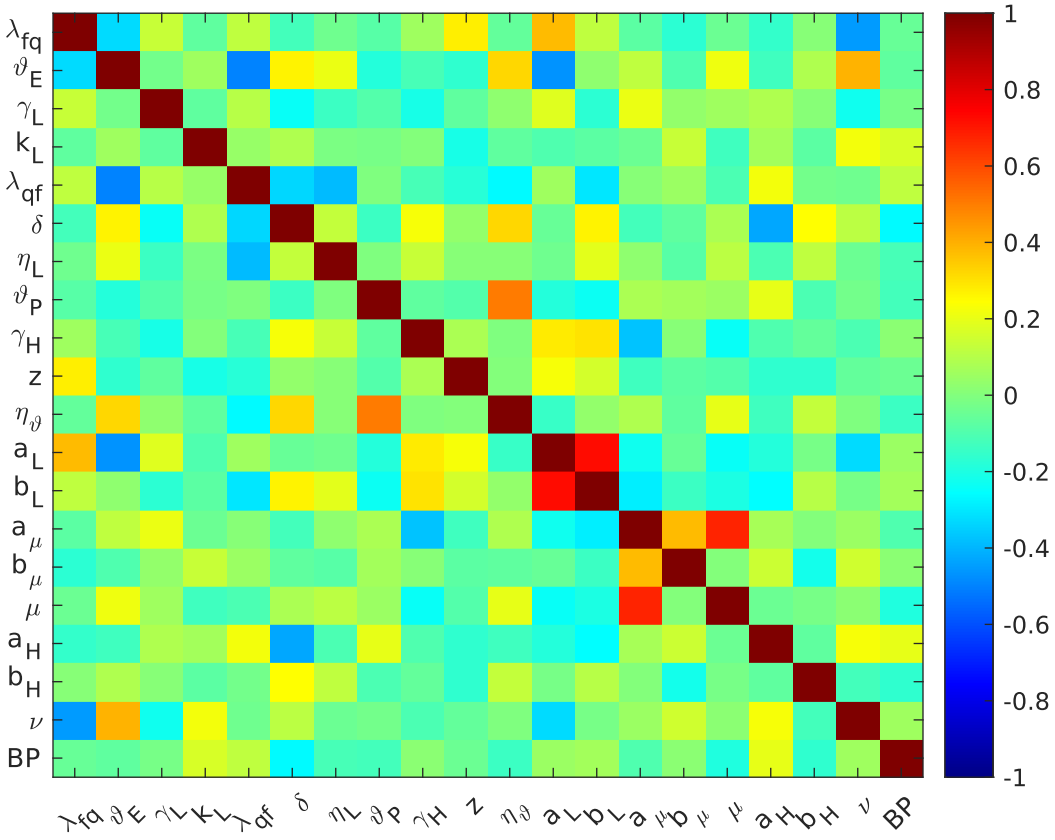
2.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0999'	'0.0394'	'0.0149'	'0.109'
\vartheta_E	'0.0282'	'0.0547'	'0.0414'	'0.1157'	'0.0854'
\gamma_L	'0.067'	'0.1337'	'0.1004'	'0.0803'	'0.0845'
k_L	'5.2301'	'5.7056'	'5.4679'	'5.3921'	'0.0718'
\lambda_{qf}	'0.5073'	'0.6221'	'0.5647'	'0.3563'	'0.1196'
\delta	'0.0097'	'0.0243'	'0.017'	'0.1063'	'0.1181'
\eta_L	'0.5881'	'0.6908'	'0.6395'	'0.6374'	'0.1002'
\vartheta_P	'0.0002'	'0.0008'	'0.0005'	'0.0002'	'0.0659'
\gamma_H	'0.516'	'0.6279'	'0.5719'	'0.5529'	'0.1122'
z	'0.0672'	'1.6273'	'0.8472'	'0.5695'	'0.0786'
\eta_\vartheta	'0.7771'	'0.8503'	'0.8137'	'0.8597'	'0.1055'
a_L	'2.6229'	'3.52'	'3.0715'	'1.6232'	'0.1186'
b_L	'3.176'	'4.4106'	'3.7933'	'3.4613'	'0.1277'
a_\mu	'3.1976'	'4.2835'	'3.7405'	'3.7405'	'0.1144'
b_\mu	'5.5474'	'7.0234'	'6.2854'	'3.361'	'0.102'
\mu	'0.1586'	'0.2379'	'0.1982'	'0.3085'	'0.111'
a_H	'2.6337'	'4.0172'	'3.3254'	'3.7851'	'0.1116'
b_H	'8.9223'	'10.7148'	'9.8185'	'14.4012'	'0.1109'
\nu	'220.5477'	'286.8533'	'253.7005'	'372.6719'	'0.1244'
BP	'152.3111'	'152.6889'	'152.5'	'152.0844'	'0.0506'

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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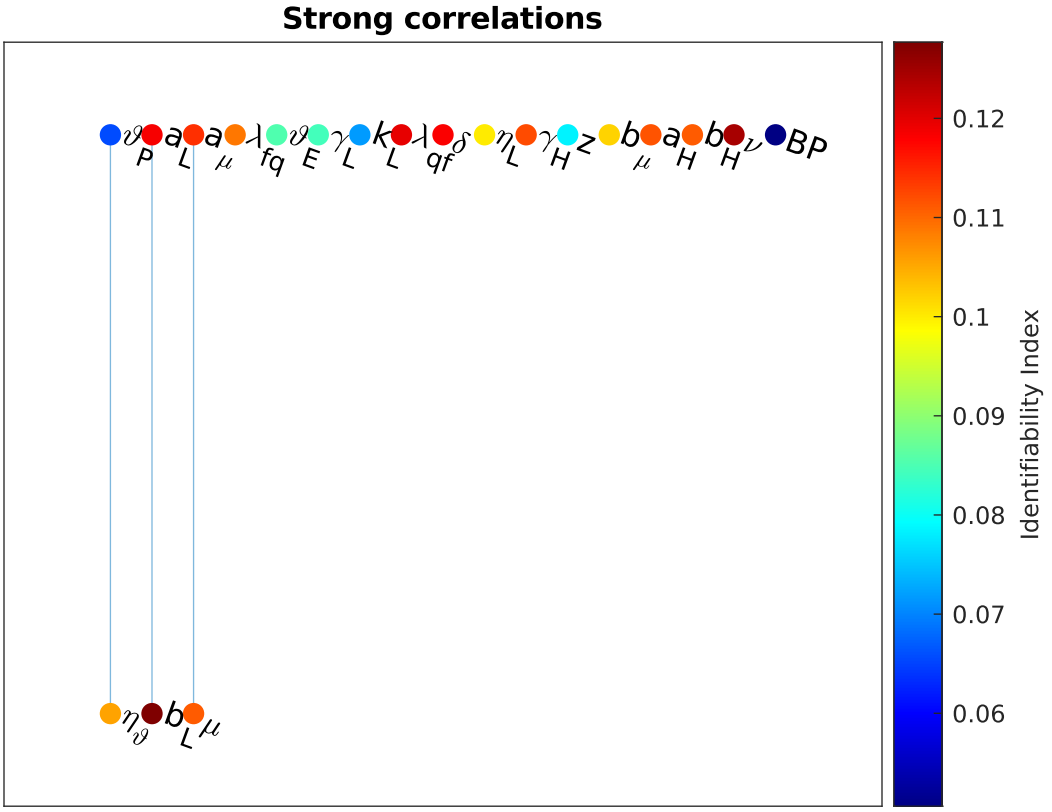
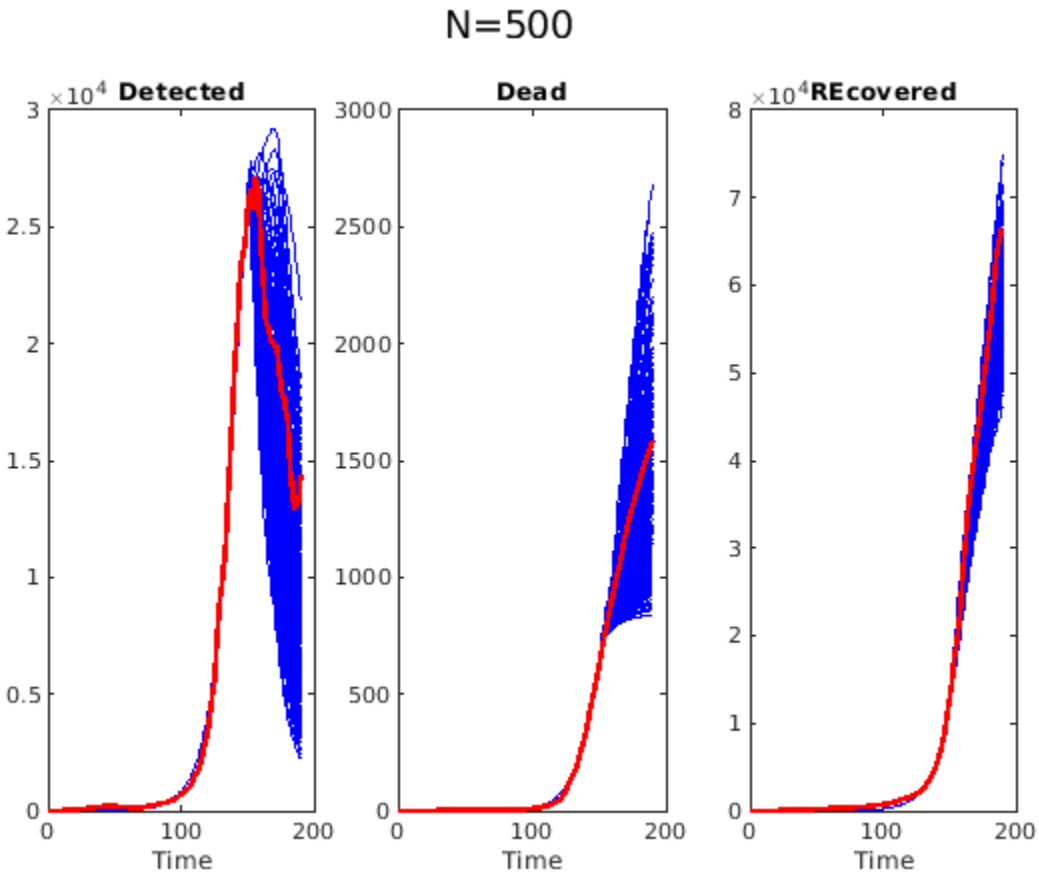
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.12
0.11
0.1
0.09
0.08
0.07
0.06

2.4. Uncertainty analisys



Chapter 3. Extension number3

3.1. Basic information

The extension to be validated consists of the time series from the data191 to the 218. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

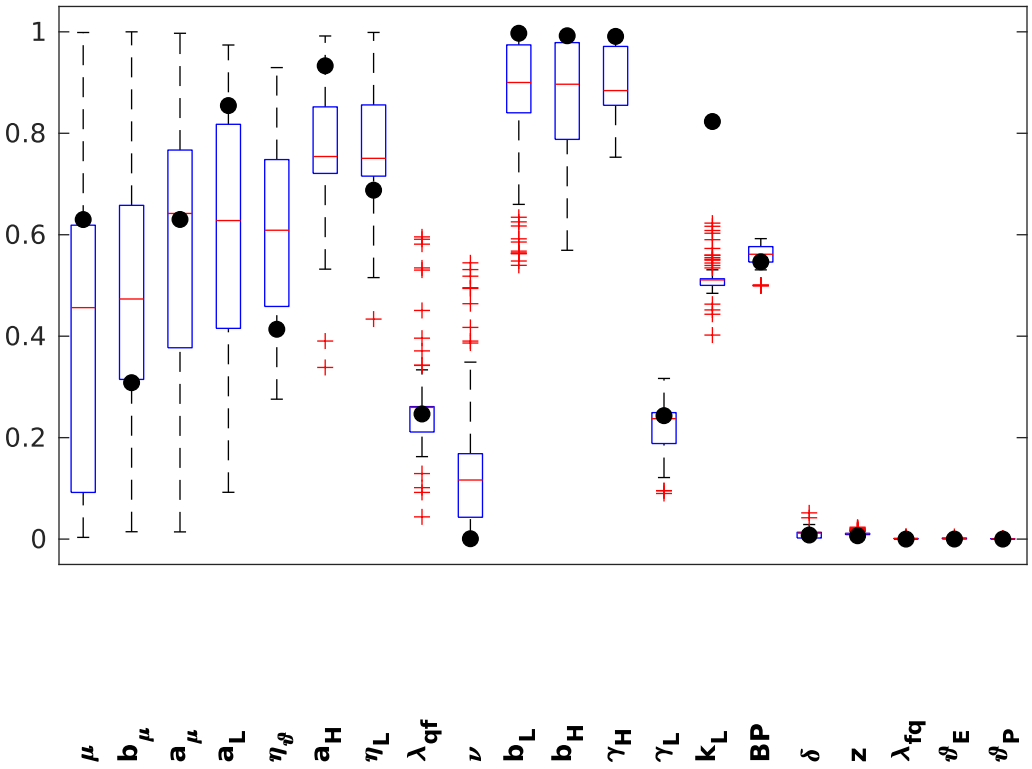
3.2. Estimated parameters with their intervals

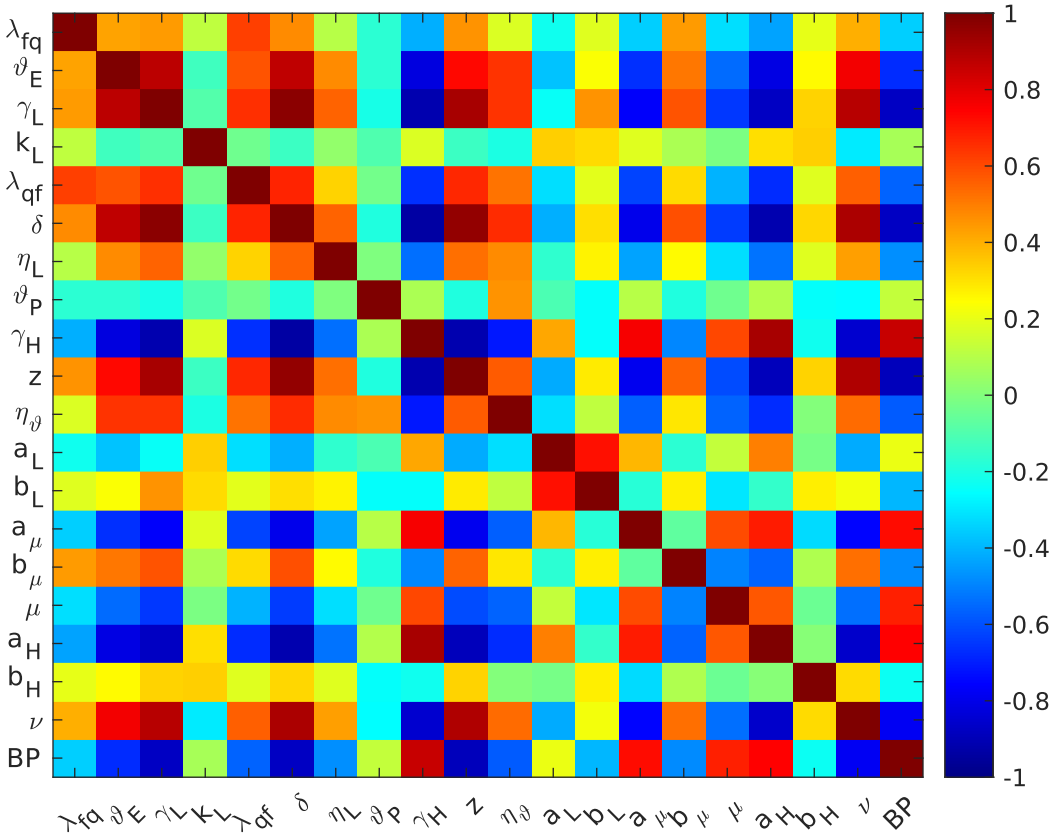
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

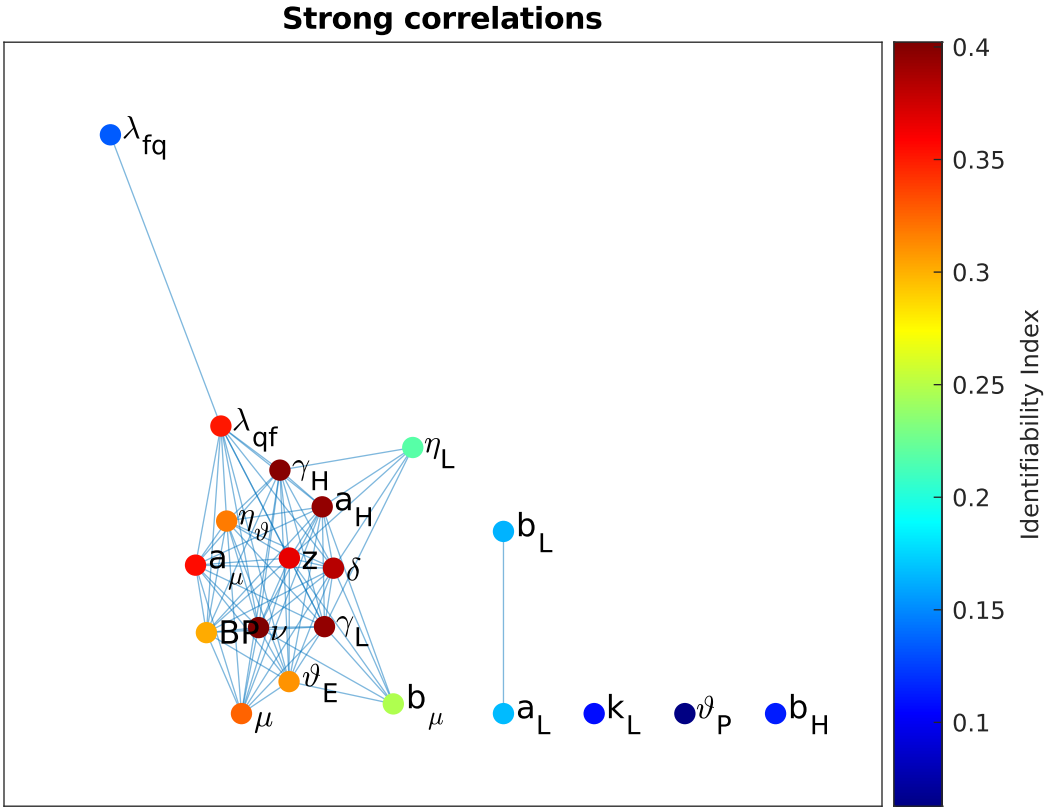
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0'	'0.0012'	'0'	'0.1346'
\vartheta_E	'0'	'0.0002'	'0.0012'	'0.0001'	'0.3095'
\gamma_L	'0.2334'	'0.5123'	'0.2388'	'0.2433'	'0.3951'
k_L	'1.2025'	'8.7841'	'5.5985'	'8.4087'	'0.1083'
\lambda_{qf}	'0.0111'	'0.5278'	'0.2612'	'0.2466'	'0.3517'
\delta	'0.0001'	'0.0027'	'0.0018'	'0.0012'	'0.3826'
\eta_L	'0.3037'	'1'	'0.7498'	'0.6878'	'0.2181'
\vartheta_P	'0'	'0.0001'	'0.0004'	'0'	'0.0628'
\gamma_H	'0.4144'	'1'	'0.8838'	'0.991'	'0.3994'
z	'0.166'	'0.2657'	'0.3318'	'0.198'	'0.3671'
\eta_\vartheta	'0.3949'	'0.4332'	'0.6089'	'0.4137'	'0.3181'
a_L	'10.6345'	'14.2618'	'9.7916'	'12.9647'	'0.1669'
b_L	'10.7231'	'15'	'13.5809'	'14.9603'	'0.1638'
a_\mu	'8.2729'	'15'	'9.9873'	'9.8215'	'0.355'
b_\mu	'1'	'6.0022'	'7.6267'	'5.3166'	'0.2471'
\mu	'0'	'0.8231'	'0.4563'	'0.6299'	'0.3264'
a_H	'5.8146'	'14.0815'	'11.5544'	'14.0625'	'0.3943'
b_H	'9.4321'	'15'	'13.5523'	'14.8915'	'0.1136'
\nu	'0.0204'	'0.8143'	'59.0833'	'0.3619'	'0.4021'
BP	'188.5083'	'193.926'	'189.5'	'188.5308'	'0.3022'

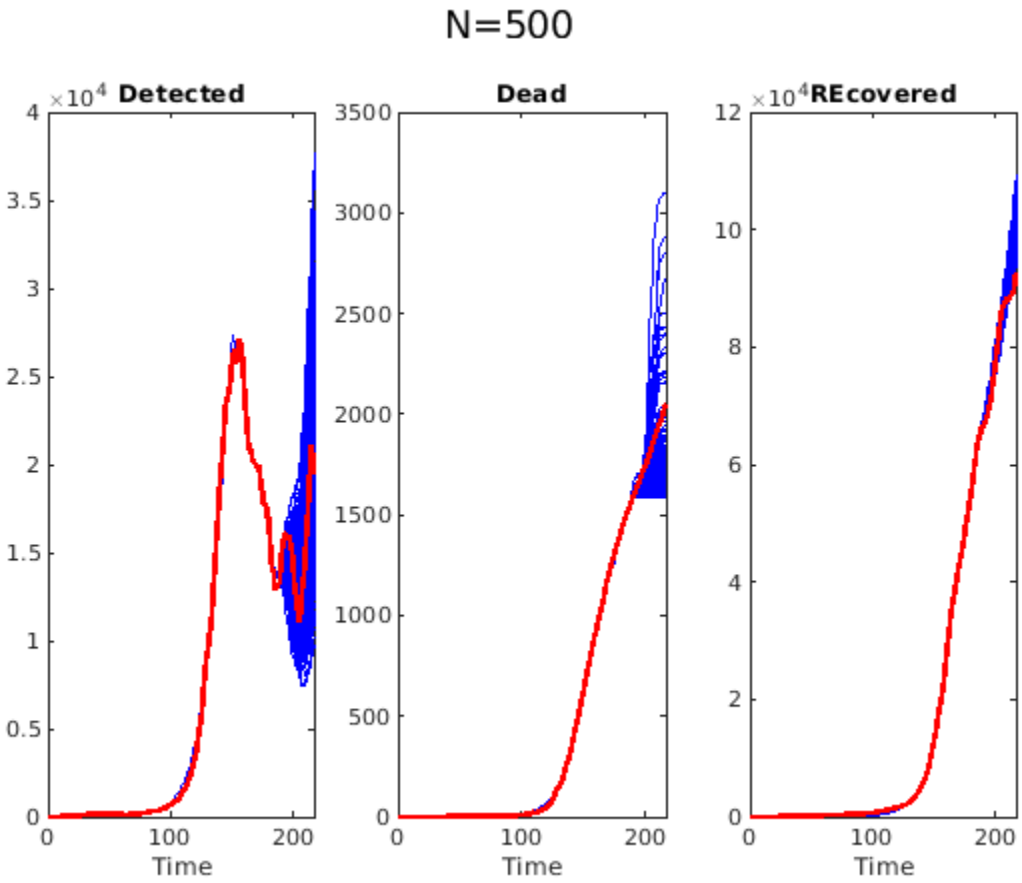
3.3. Identifiability analisys




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
λ_{fq}
λ_{qf}
γ_H
η_L
a_H
η_ϑ
b_L
a_μ
z
δ
BP
ν
γ_L
ϑ_E
b_μ
μ
a_L
k_L
ϑ_P
b_H
0.4
0.35
0.3
0.25
0.2
0.15
0.1
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 data218 to the 252. The status of the validation is: COMPLETED.

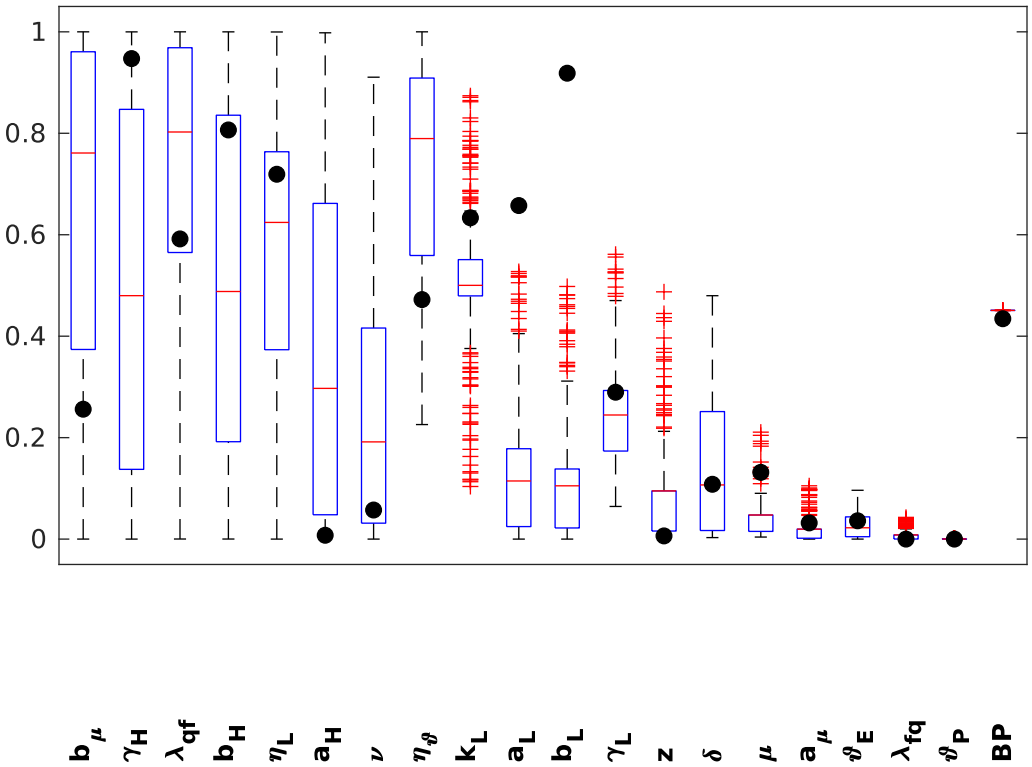
The number of estimations needed to perform the validation was1000.

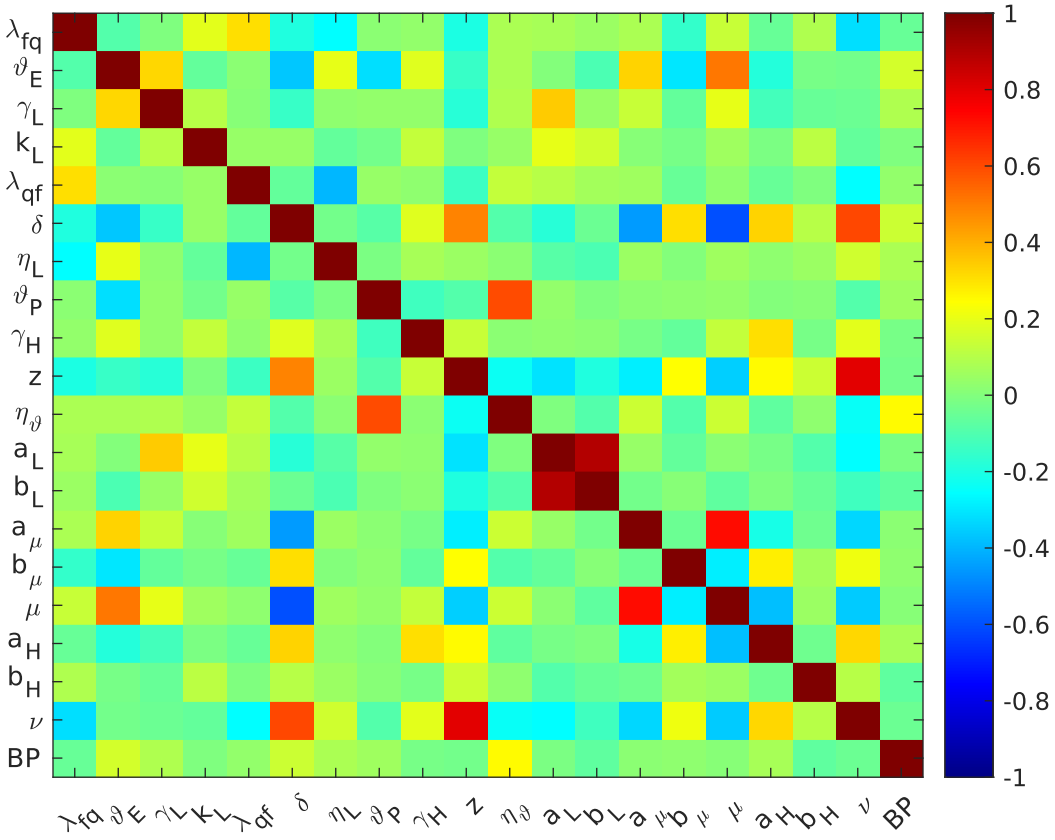
4.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0566'	'0.0082'	'0'	'0.083'
\vartheta_E	'0.0182'	'0.0264'	'0.0223'	'0.0361'	'0.0846'
\gamma_L	'0.2109'	'0.2784'	'0.2447'	'0.2895'	'0.0843'
k_L	'5.1943'	'5.8097'	'5.502'	'6.7005'	'0.0758'
\lambda_{qf}	'0.7578'	'0.8473'	'0.8025'	'0.5918'	'0.0925'
\delta	'0.0127'	'0.0194'	'0.016'	'0.0162'	'0.1278'
\eta_L	'0.5795'	'0.6691'	'0.6243'	'0.7192'	'0.0916'
\vartheta_P	'0'	'0.0004'	'0.0002'	'0'	'0.0581'
\gamma_H	'0.4239'	'0.5359'	'0.4799'	'0.9472'	'0.1029'
z	'1.2279'	'4.4707'	'2.8493'	'0.1886'	'0.1449'
\eta_\vartheta	'0.7554'	'0.8237'	'0.7896'	'0.4722'	'0.1022'
a_L	'2.1939'	'3.0146'	'2.6043'	'10.2055'	'0.1013'
b_L	'1.883'	'3.0581'	'2.4706'	'13.8578'	'0.1059'
a_\mu	'1'	'1.5561'	'1.2753'	'1.4471'	'0.0952'
b_\mu	'10.9472'	'12.3642'	'11.6557'	'4.5849'	'0.1044'
\mu	'0'	'0.0971'	'0.0475'	'0.1316'	'0.1629'
a_H	'4.4318'	'5.8873'	'5.1596'	'1.1058'	'0.1112'
b_H	'7.0834'	'8.5837'	'7.8335'	'12.2919'	'0.0927'
\nu	'76.4385'	'115.1941'	'95.8163'	'28.6632'	'0.1455'
BP	'218.4248'	'218.5751'	'218.5'	'217.4998'	'0.0421'

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
0.2
0
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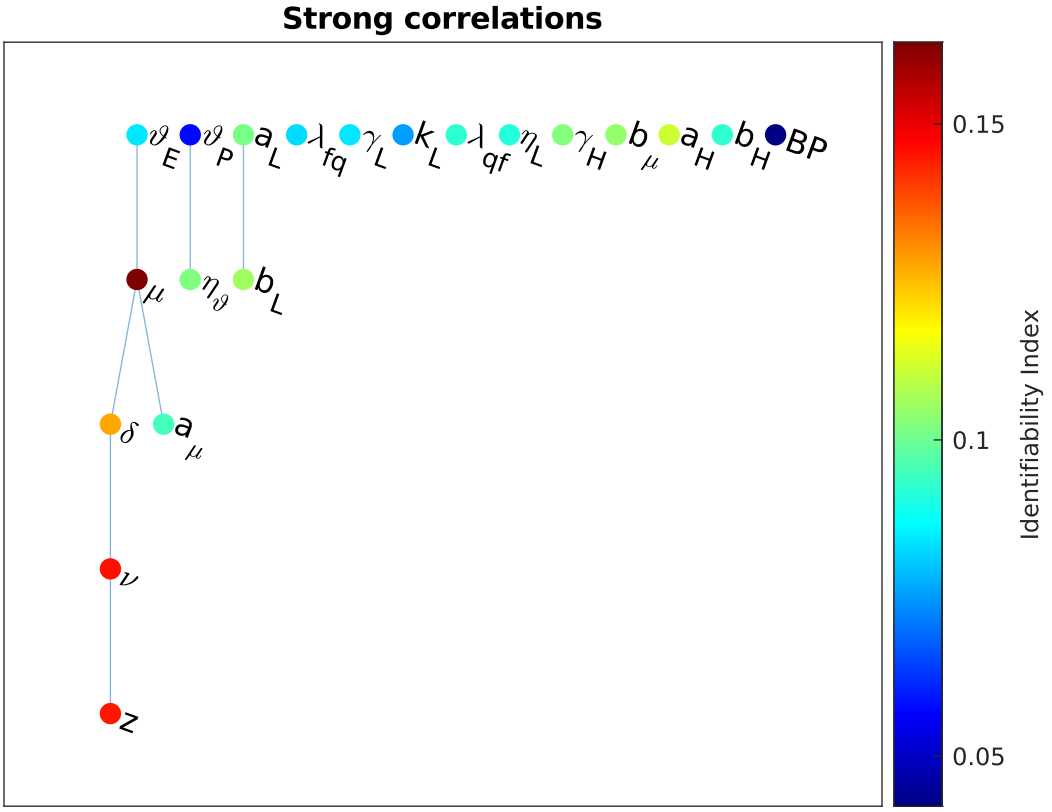
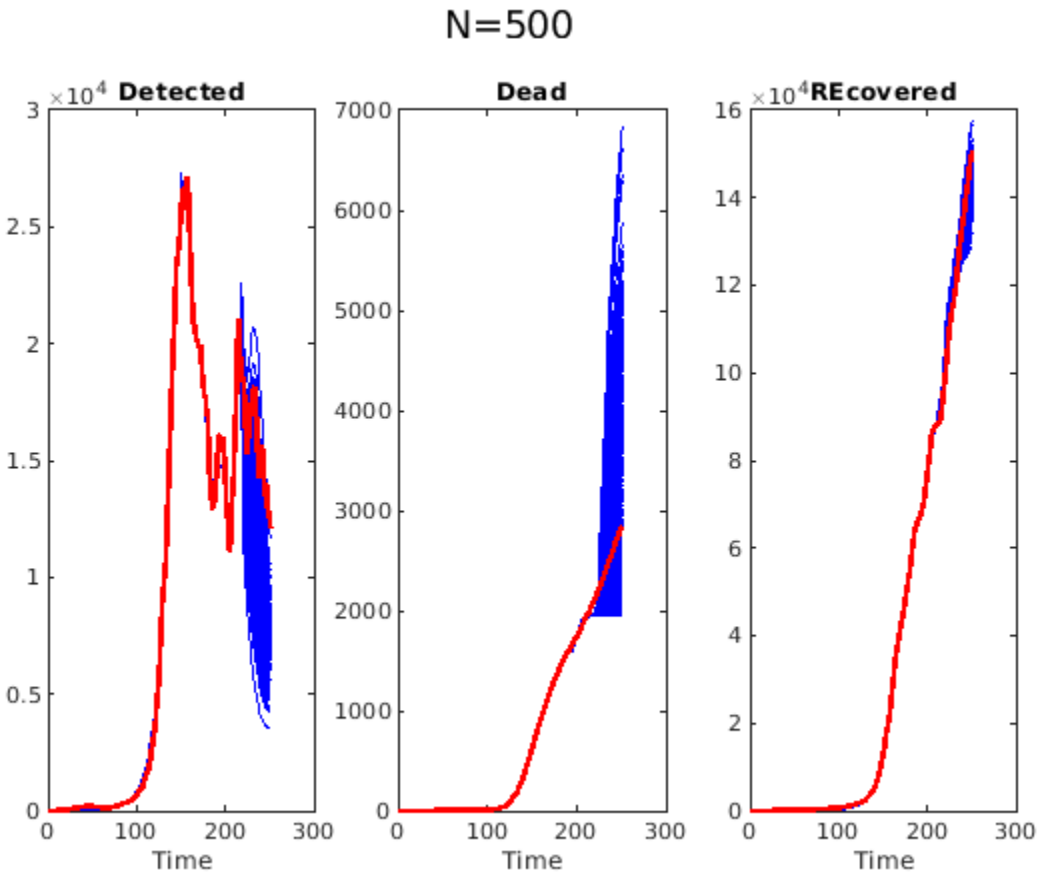
-0.4
-0.6
-0.8
-1


Strong correlations
ϑ_E ϑ_P a_L λ_{fq} γ_L k_L λ_{qf} η_L γ_H b_μ a_H b_H BP
μ η_ϑ b_L
δ a_μ
ν
z
0.15
0.1
0.05
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 data252 to the 284. The status of the validation is: COMPLETED.

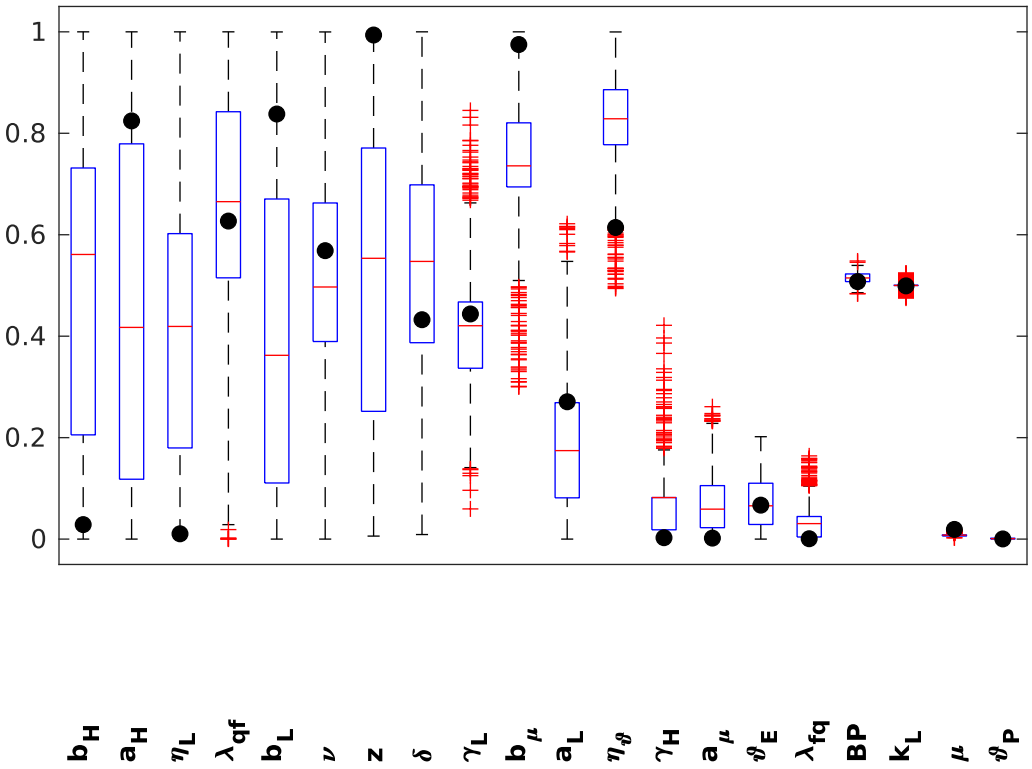
The number of estimations needed to perform the validation was1000.

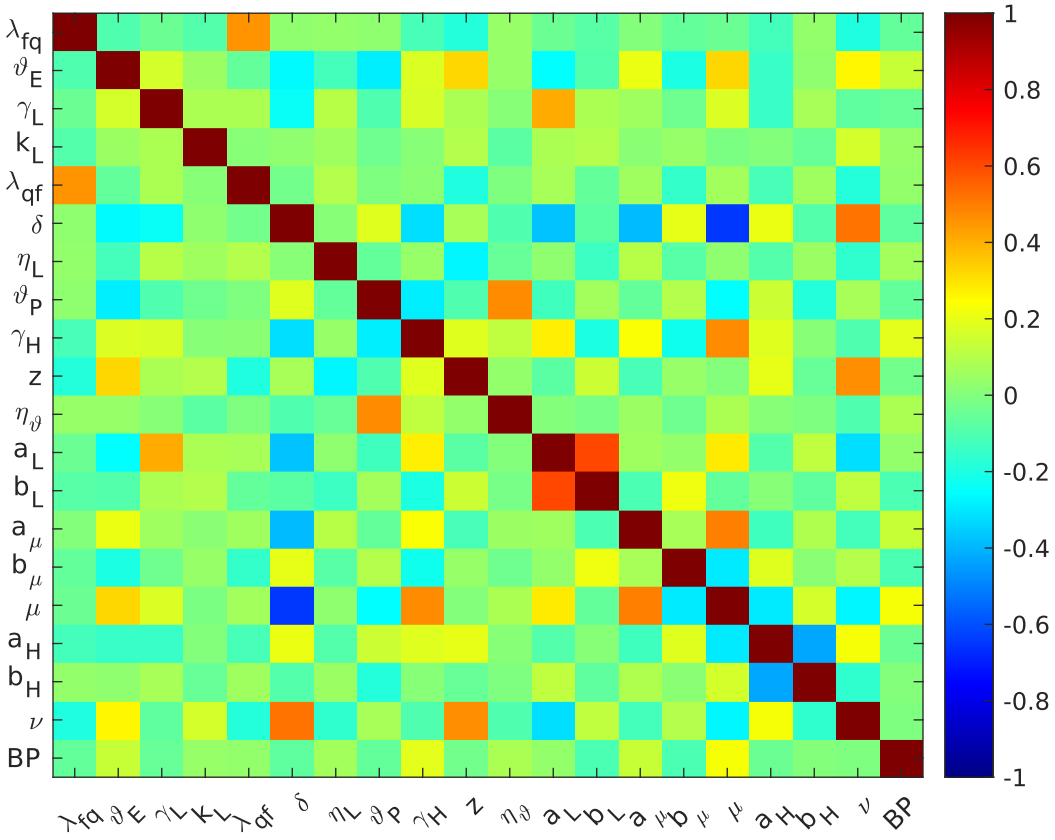
5.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0041'	'0.0569'	'0.0305'	'0.0007'	'0.0731'
\vartheta_E	'0.0607'	'0.0705'	'0.0656'	'0.0669'	'0.0701'
\gamma_L	'0.3991'	'0.4421'	'0.4206'	'0.4438'	'0.0738'
k_L	'5.3757'	'5.6247'	'5.5002'	'5.4926'	'0.0521'
\lambda_{qf}	'0.6405'	'0.6899'	'0.6652'	'0.627'	'0.0716'
\delta	'0.0783'	'0.0859'	'0.0821'	'0.0649'	'0.1231'
\eta_L	'0.3918'	'0.4466'	'0.4192'	'0.0104'	'0.0724'
\vartheta_P	'0.0006'	'0.001'	'0.0008'	'0.0003'	'0.0579'
\gamma_H	'0.0455'	'0.1184'	'0.0819'	'0.0028'	'0.1031'
z	'15.657'	'17.5562'	'16.6066'	'29.8115'	'0.0899'
\eta_\vartheta	'0.8082'	'0.849'	'0.8286'	'0.6143'	'0.062'
a_L	'3.1893'	'3.695'	'3.4422'	'4.79'	'0.0966'
b_L	'5.6273'	'6.517'	'6.0721'	'12.7318'	'0.0987'
a_\mu	'1.6506'	'2.0028'	'1.8267'	'1.0273'	'0.0689'
b_\mu	'10.9411'	'11.6614'	'11.3013'	'14.6494'	'0.0781'
\mu	'0'	'0.0288'	'0.0078'	'0.0191'	'0.1043'
a_H	'6.3575'	'7.3274'	'6.8425'	'12.5421'	'0.0942'
b_H	'8.4126'	'9.2984'	'8.8555'	'1.4001'	'0.0774'
\nu	'235.8472'	'261.1404'	'248.4938'	'284.3028'	'0.108'
BP	'251.8621'	'252.0916'	'251.9768'	'251.5'	'0.0453'

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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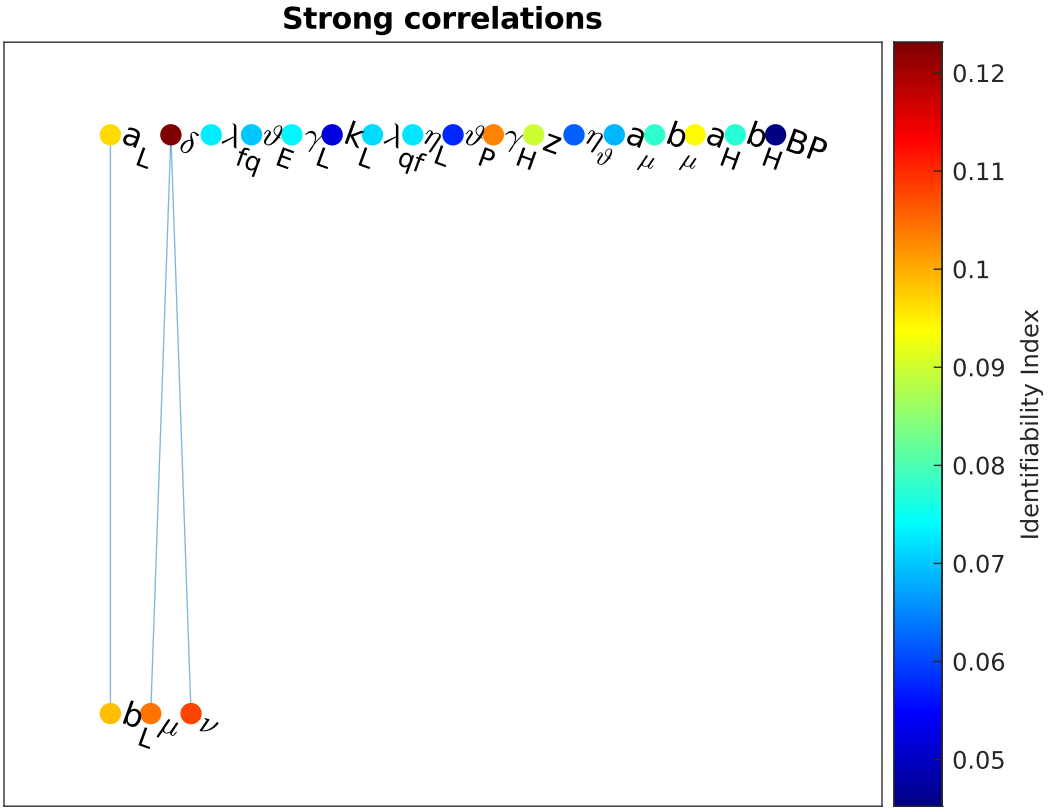
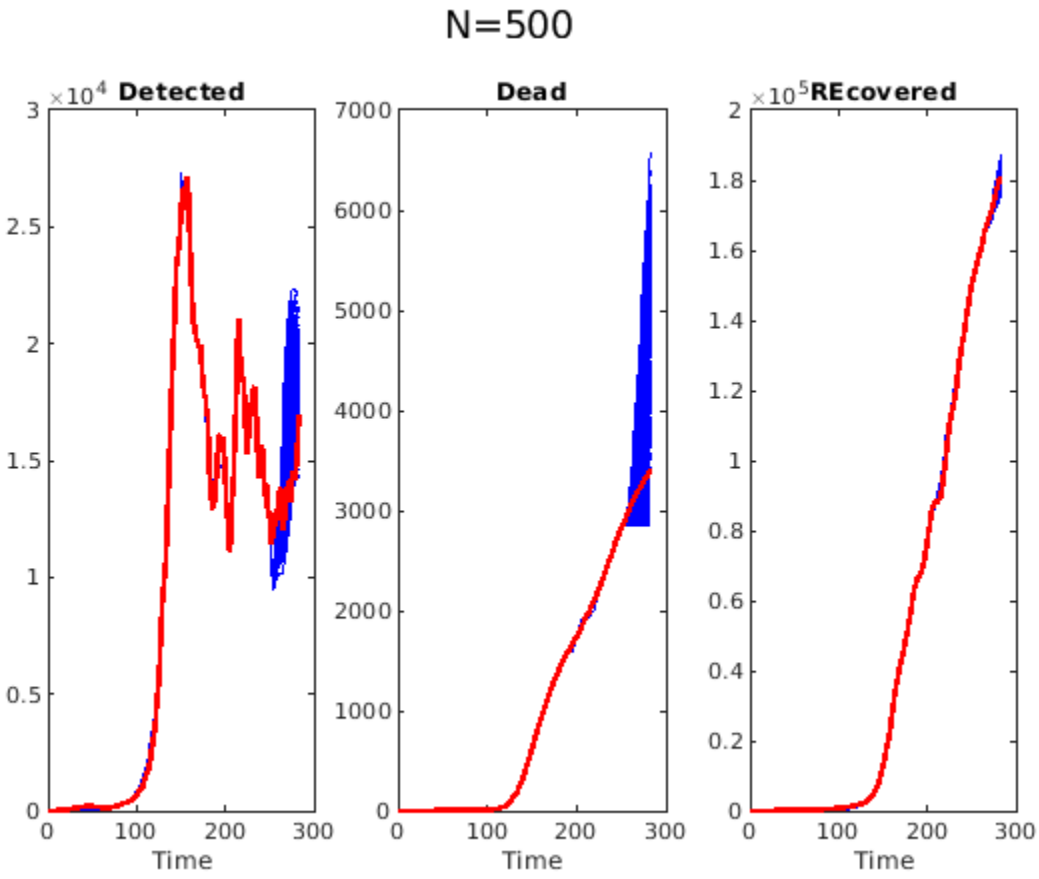
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


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

5.4. Uncertainty analisys



Chapter 6. Extension number6

6.1. Basic information

The extension to be validated consists of the time series from the data284 to the 312. The status of the validation is: COMPLETED.

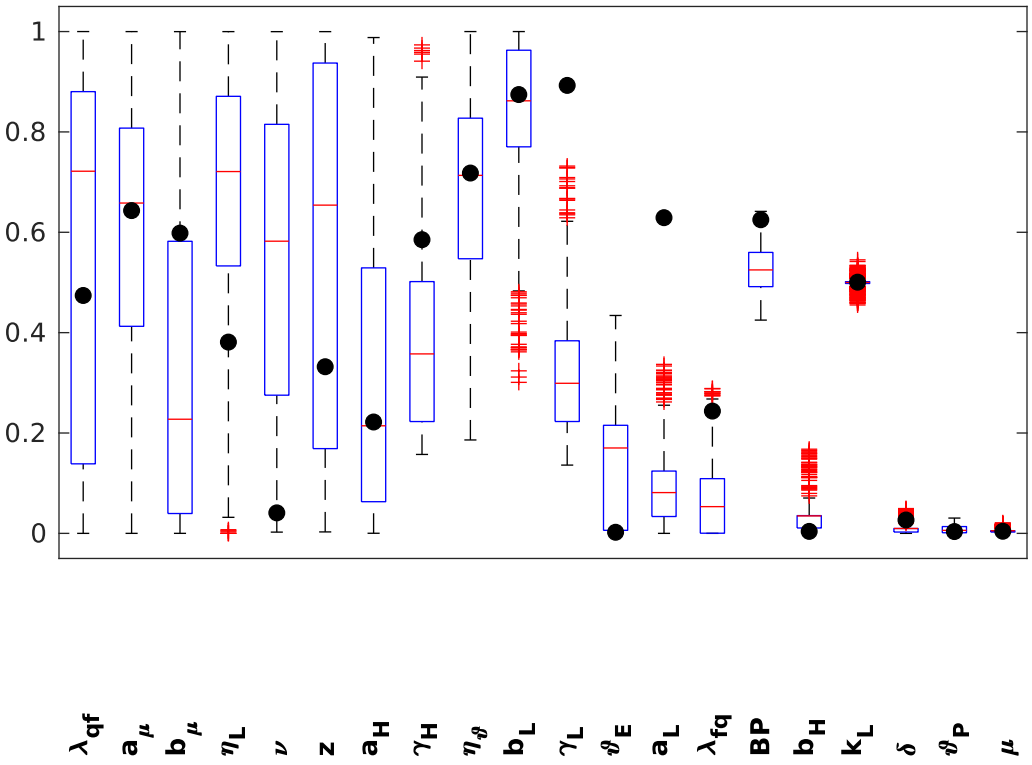
The number of estimations needed to perform the validation was1000.

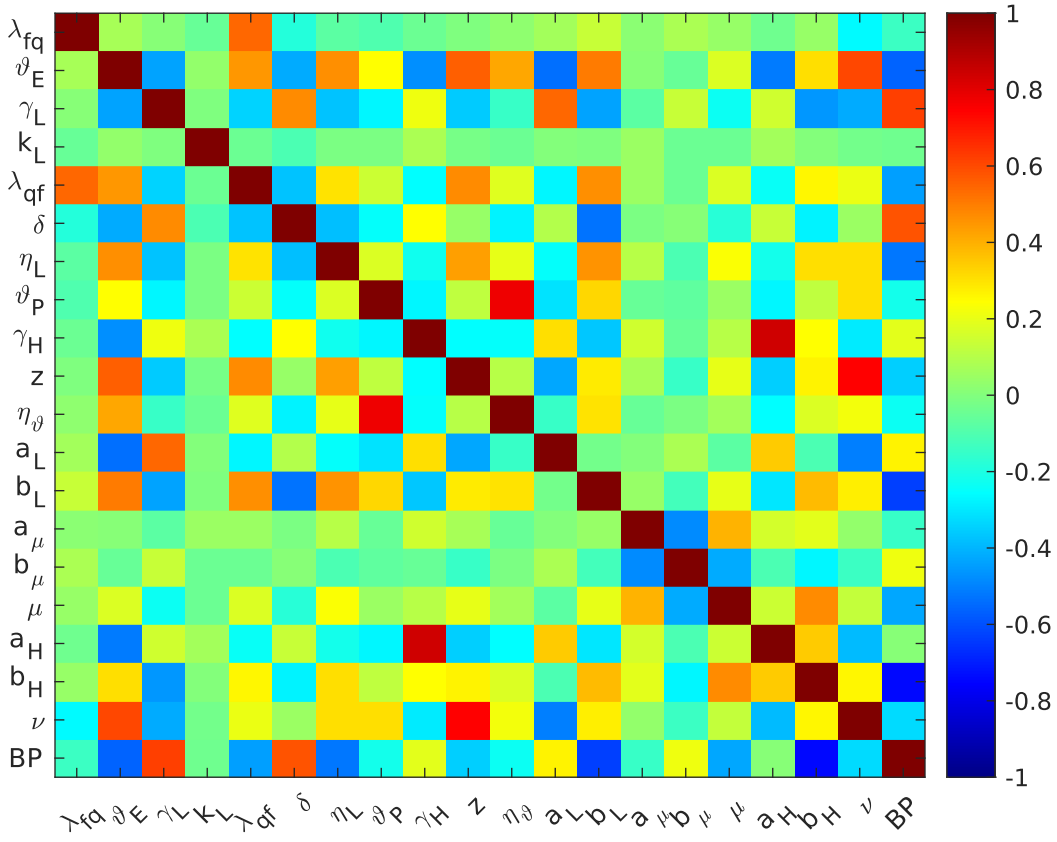
6.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0284'	'0.0782'	'0.0533'	'0.2437'	'0.0865'
\vartheta_E	'0.1591'	'0.1819'	'0.1705'	'0.0022'	'0.1967'
\gamma_L	'0.2772'	'0.3225'	'0.2999'	'0.8927'	'0.1439'
k_L	'5.3864'	'5.6135'	'5.4999'	'5.5052'	'0.0462'
\lambda_{qf}	'0.6816'	'0.7618'	'0.7217'	'0.4741'	'0.1432'
\delta	'0'	'0.0062'	'0.0015'	'0.004'	'0.1282'
\eta_L	'0.6956'	'0.7465'	'0.721'	'0.3812'	'0.127'
\vartheta_P	'0.005'	'0.007'	'0.006'	'0.0036'	'0.0894'
\gamma_H	'0.3375'	'0.378'	'0.3578'	'0.5853'	'0.1184'
z	'18.4436'	'20.8027'	'19.6231'	'9.9623'	'0.1544'
\eta_\vartheta	'0.6917'	'0.7351'	'0.7134'	'0.718'	'0.1076'
a_L	'1.9362'	'2.3406'	'2.1384'	'9.8075'	'0.1314'
b_L	'12.6159'	'13.5091'	'13.0625'	'13.2424'	'0.1668'
a_\mu	'9.798'	'10.6335'	'10.2157'	'10.0054'	'0.081'
b_\mu	'3.7379'	'4.6311'	'4.1845'	'9.3769'	'0.089'
\mu	'0'	'0.0125'	'0.0052'	'0.0042'	'0.0781'
a_H	'3.5693'	'4.442'	'4.0057'	'4.107'	'0.142'
b_H	'1.2035'	'1.7726'	'1.488'	'1.0556'	'0.1231'
\nu	'274.0931'	'308.1501'	'291.1216'	'20.4401'	'0.1653'
BP	'283.1712'	'283.8288'	'283.5'	'289.5'	'0.1883'

6.3. 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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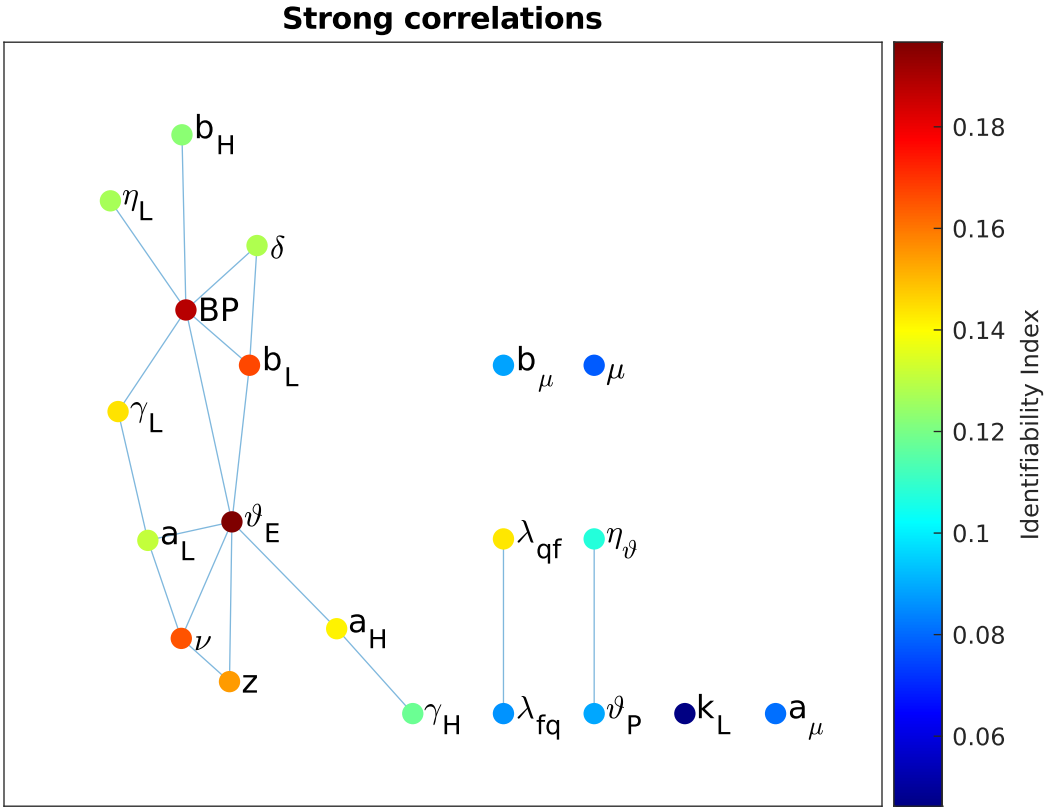
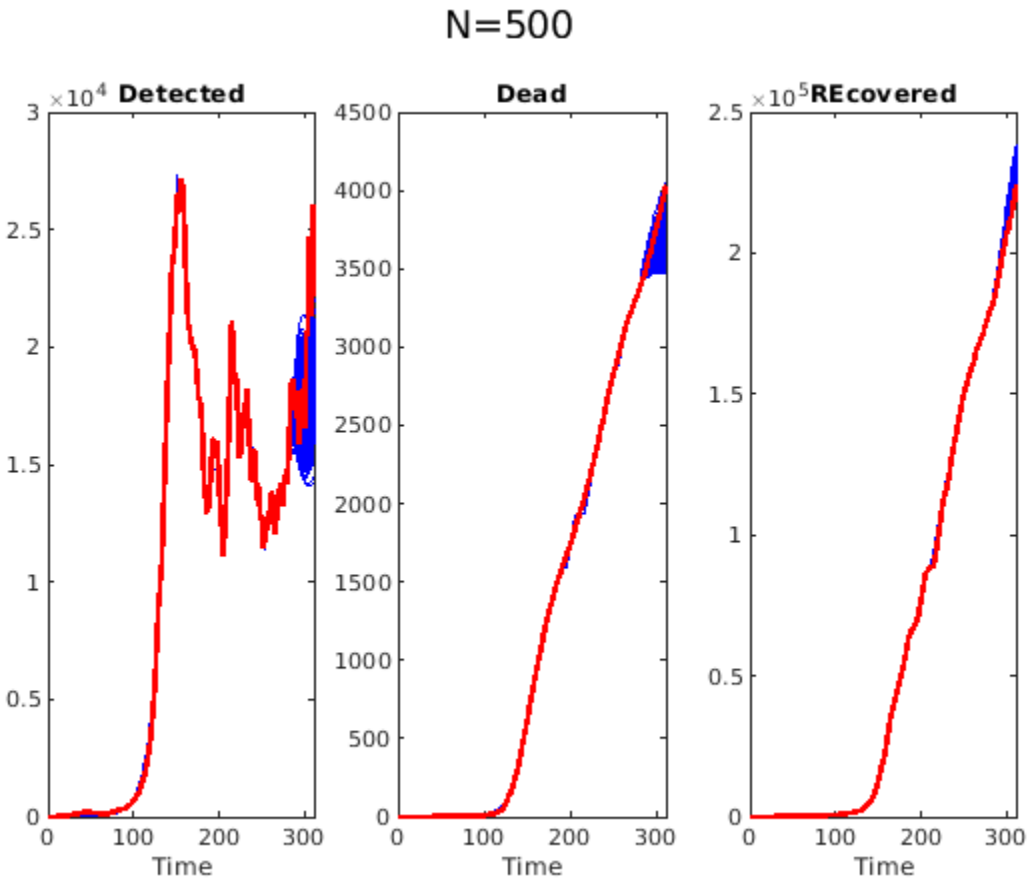
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
b H
η L
δ
BP
b L
γ L
ϑ E
a L
ν
z
a H
γ H
b μ
μ
λ qf
η_ϑ
λ fq
ϑ P
k L
a μ
0.18
0.16
0.14
0.12
0.1
0.08
0.06
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 data331 to the 331. The status of the validation is: COMPLETED.

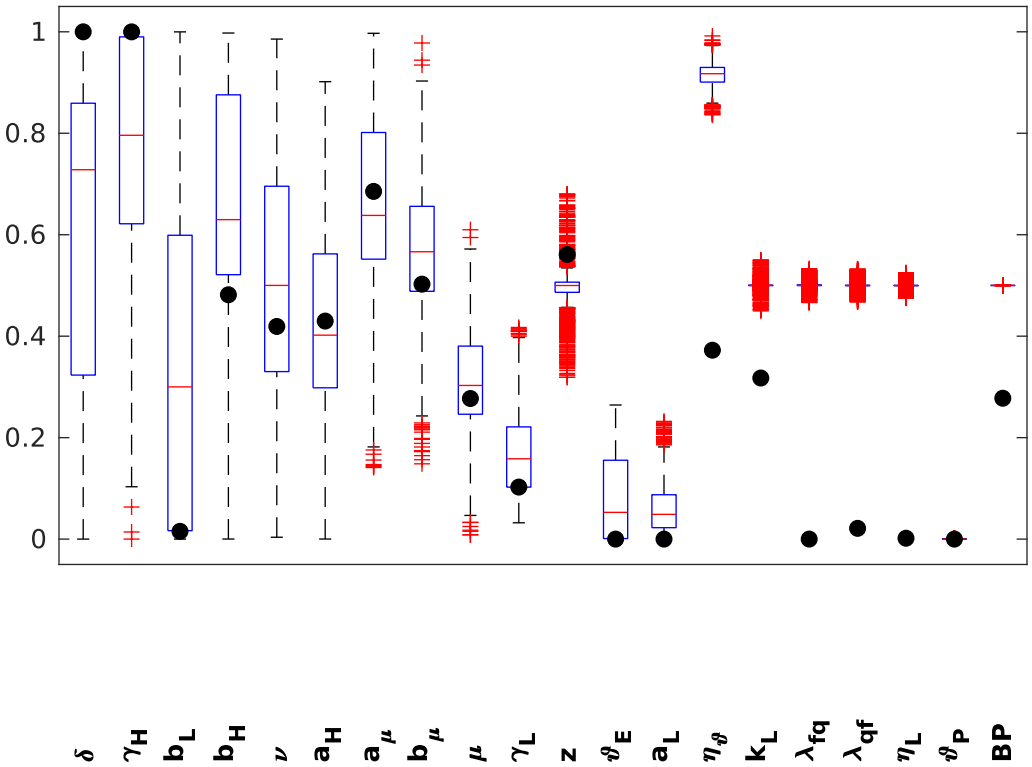
The number of estimations needed to perform the validation was1000.

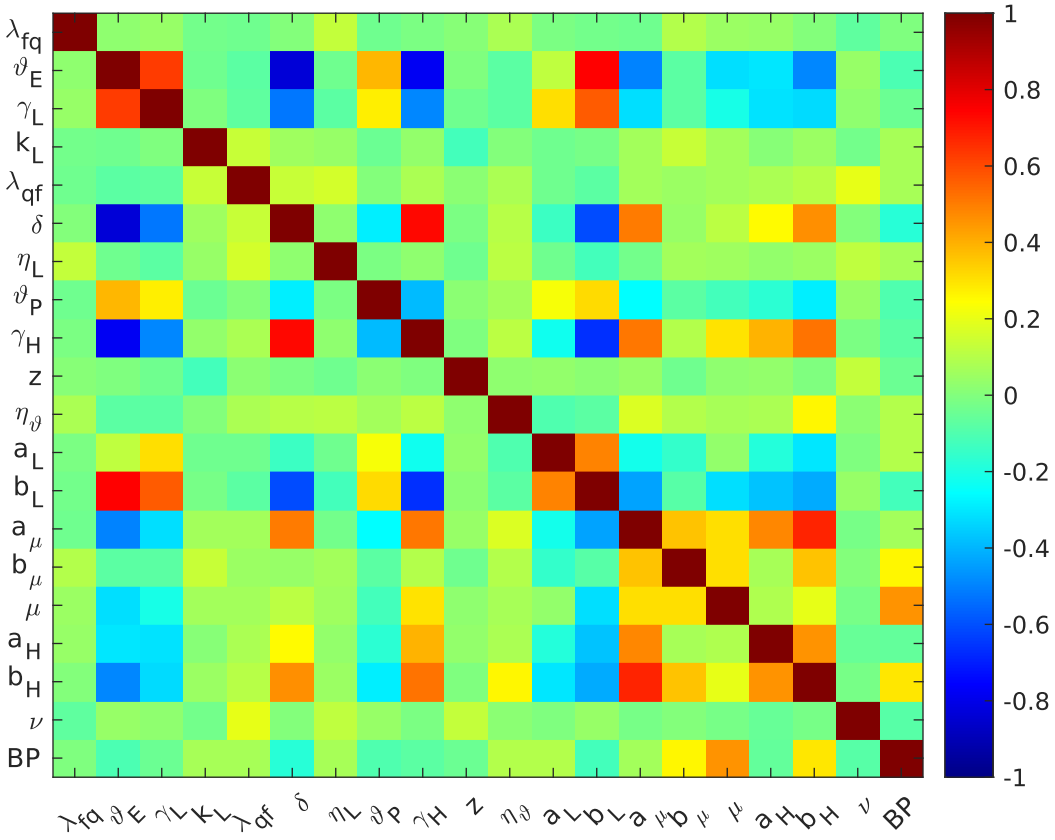
7.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4926'	'0.5076'	'0.5001'	'0'	'0.0418'
\vartheta_E	'0.0464'	'0.059'	'0.0527'	'0'	'0.1511'
\gamma_L	'0.1423'	'0.1745'	'0.1584'	'0.1025'	'0.1336'
k_L	'5.4301'	'5.5702'	'5.5001'	'3.8579'	'0.045'
\lambda_{qf}	'0.4928'	'0.5071'	'0.4999'	'0.0212'	'0.0515'
\delta	'0.1052'	'0.1132'	'0.1092'	'0.15'	'0.1769'
\eta_L	'0.4933'	'0.5066'	'0.4999'	'0.0017'	'0.0471'
\vartheta_P	'0'	'0.0002'	'0.0001'	'0'	'0.0636'
\gamma_H	'0.7788'	'0.8131'	'0.796'	'0.9999'	'0.1727'
z	'14.6622'	'15.3309'	'14.9966'	'16.8332'	'0.0443'
\eta_\vartheta	'0.9078'	'0.9268'	'0.9173'	'0.3724'	'0.0561'
a_L	'1.5338'	'1.8332'	'1.6835'	'1.0001'	'0.0699'
b_L	'4.8437'	'5.5574'	'5.2006'	'1.214'	'0.1693'
a_\mu	'9.6915'	'10.1736'	'9.9326'	'10.5954'	'0.1429'
b_\mu	'8.7419'	'9.1174'	'8.9297'	'8.0352'	'0.0693'
\mu	'0.2929'	'0.3131'	'0.303'	'0.2771'	'0.0742'
a_H	'6.4386'	'6.8195'	'6.6291'	'7.017'	'0.0822'
b_H	'9.5285'	'10.1044'	'9.8165'	'7.7429'	'0.1366'
\nu	'240.0991'	'259.9759'	'250.0375'	'209.5882'	'0.0564'
BP	'316.4237'	'316.5762'	'316.4999'	'314.4991'	'0.0619'

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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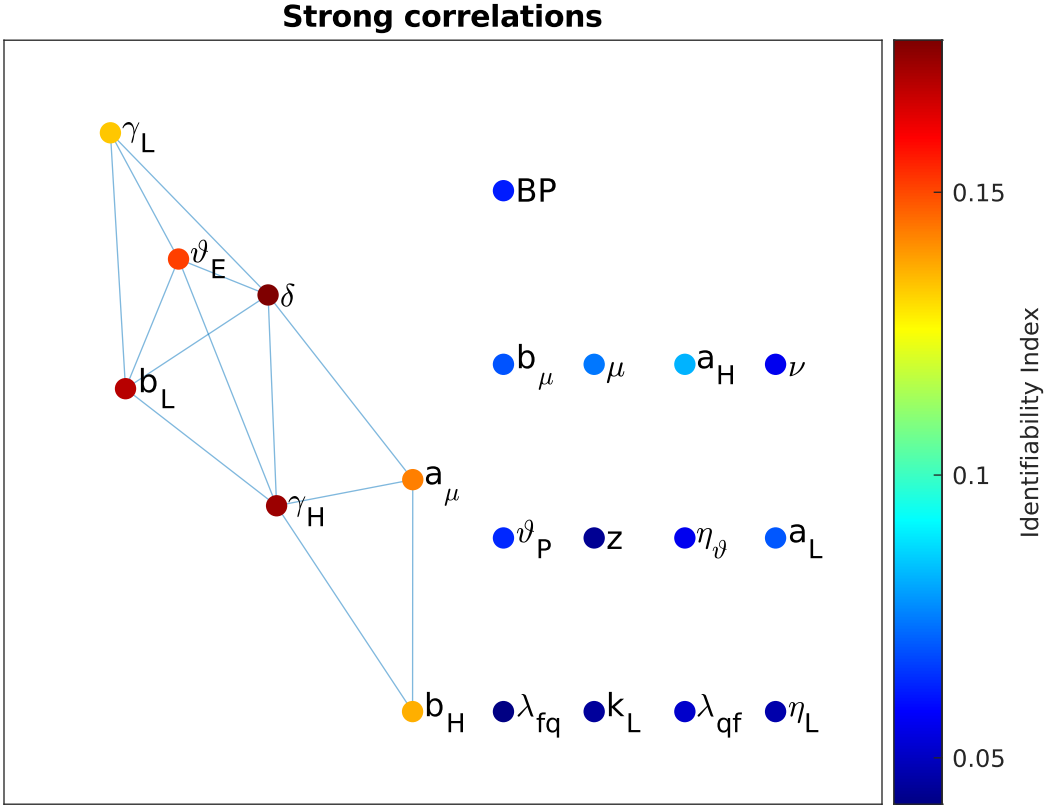
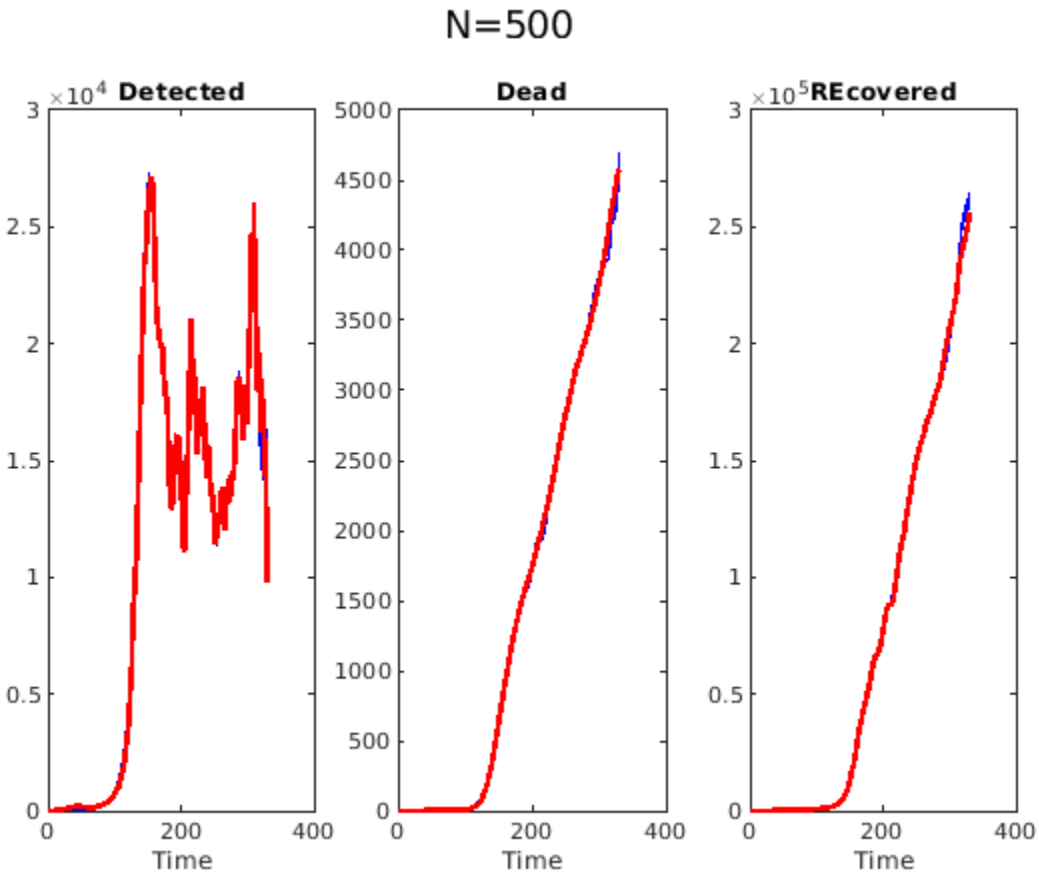
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
γ_L
ϑ_E
δ
b_L
a_μ
γ_H
b_H
BP
b_μ
μ
a_H
ν
ϑ_P
z
η_ϑ
a_L
λ_{fq}
k_L
λ_{qf}
η_L
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 data331 to the 390. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was3000.

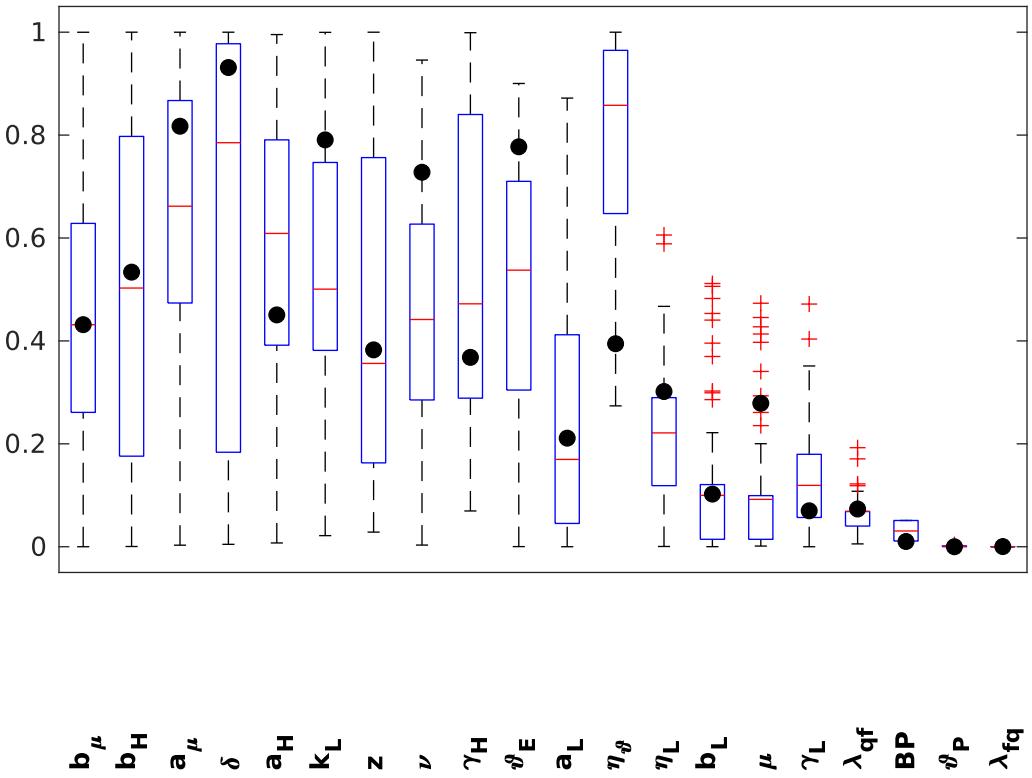
8.2. Estimated parameters with their intervals

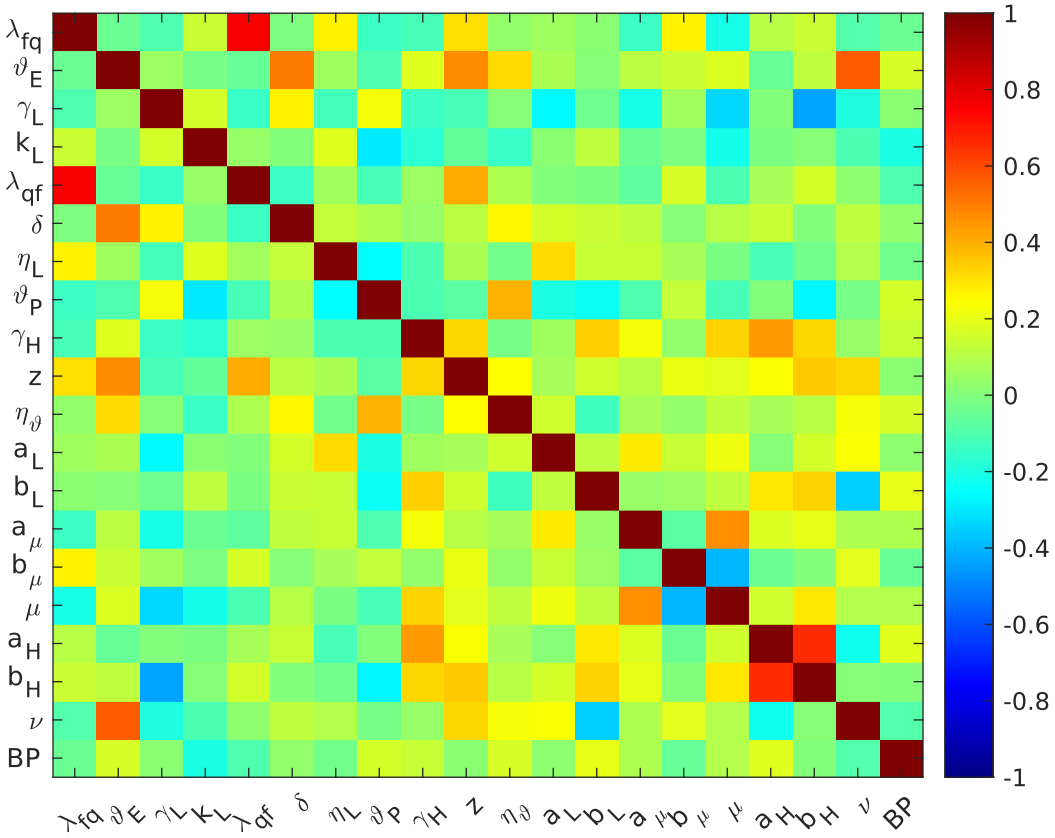
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0002'	'0.0008'	'0.0002'	'0.0003'	'0.1208'
\vartheta_E	'0.6126'	'0.7966'	'0.5375'	'0.7773'	'0.1638'
\gamma_L	'0.0379'	'0.0978'	'0.1199'	'0.0699'	'0.1254'
k_L	'2.216'	'8.8517'	'5.5056'	'8.1167'	'0.123'
\lambda_{qf}	'0.0671'	'0.1393'	'0.0686'	'0.0733'	'0.157'
\delta	'0.0278'	'0.1402'	'0.1178'	'0.1397'	'0.1798'
\eta_L	'0.2987'	'0.3537'	'0.2217'	'0.3016'	'0.1093'
\vartheta_P	'0'	'0'	'0.0008'	'0'	'0.0637'
\gamma_H	'0.2253'	'1'	'0.4721'	'0.368'	'0.1462'
z	'8.6654'	'12.3205'	'10.6874'	'11.478'	'0.1627'
\eta_\vartheta	'0.2949'	'0.9089'	'0.8579'	'0.3945'	'0.1222'
a_L	'3.3997'	'10.4902'	'3.3856'	'3.9543'	'0.1466'
b_L	'2.0286'	'11.2643'	'2.409'	'2.4321'	'0.151'
a_\mu	'8.5197'	'14.303'	'10.2654'	'12.4413'	'0.1359'
b_\mu	'1.9488'	'10.061'	'7.0404'	'7.0423'	'0.1215'
\mu	'0.0251'	'0.4599'	'0.0924'	'0.2788'	'0.1598'
a_H	'2.6348'	'9.5298'	'9.5243'	'7.3081'	'0.1466'
b_H	'4.5164'	'13.1078'	'8.0385'	'8.4714'	'0.174'
\nu	'356.3309'	'440.1921'	'220.8063'	'363.899'	'0.1454'
BP	'331'	'333.4526'	'332.5'	'331.5'	'0.0522'

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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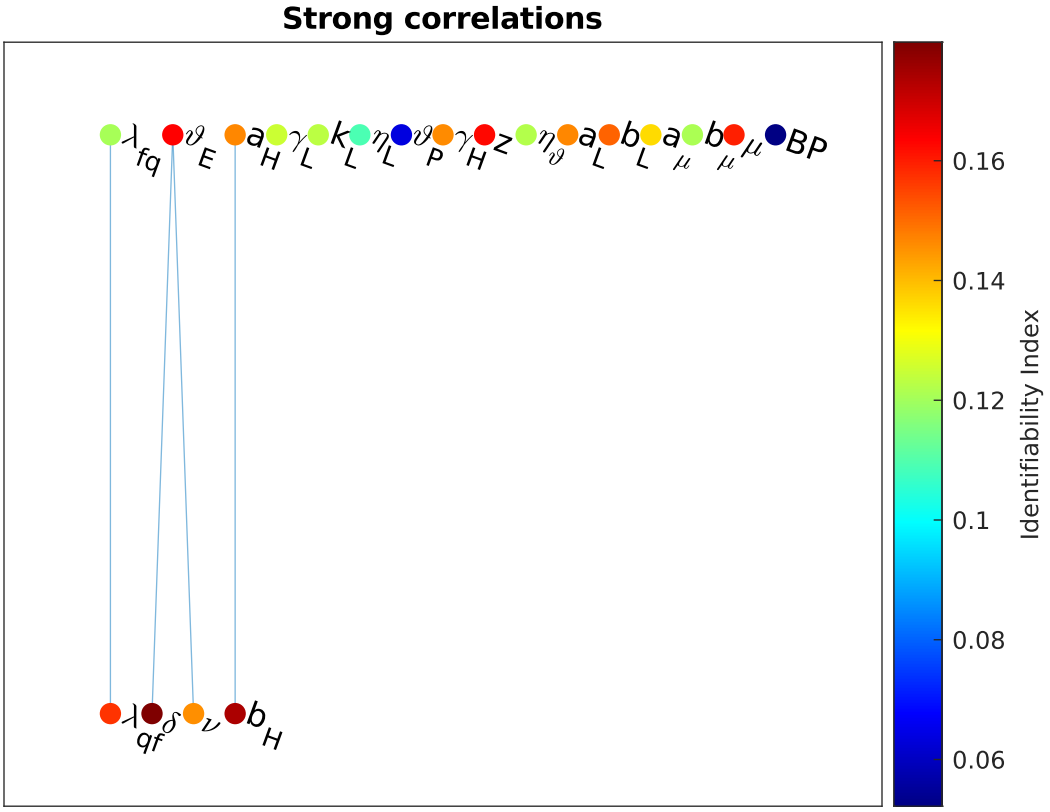
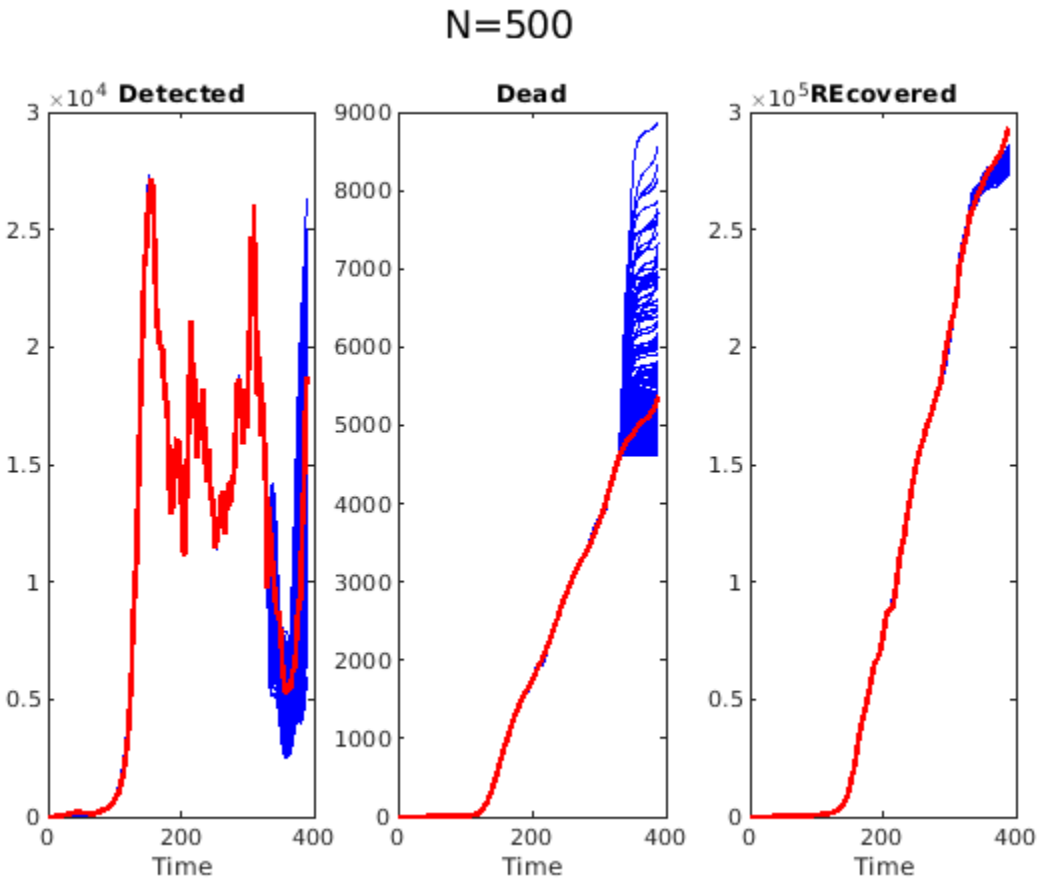
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.16
0.14
0.12
0.1
0.08
0.06

8.4. Uncertainty analisys



Chapter 9. Extension number9

9.1. Basic information

The extension to be validated consists of the time series from the data390 to the 411. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

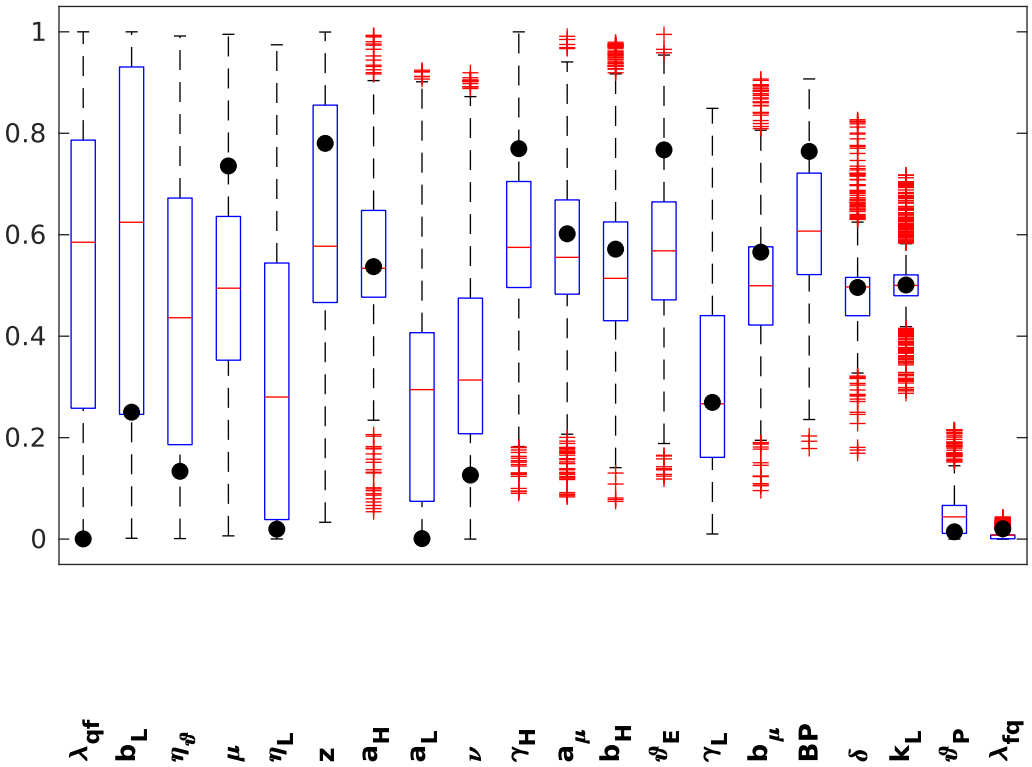
9.2. Estimated parameters with their intervals

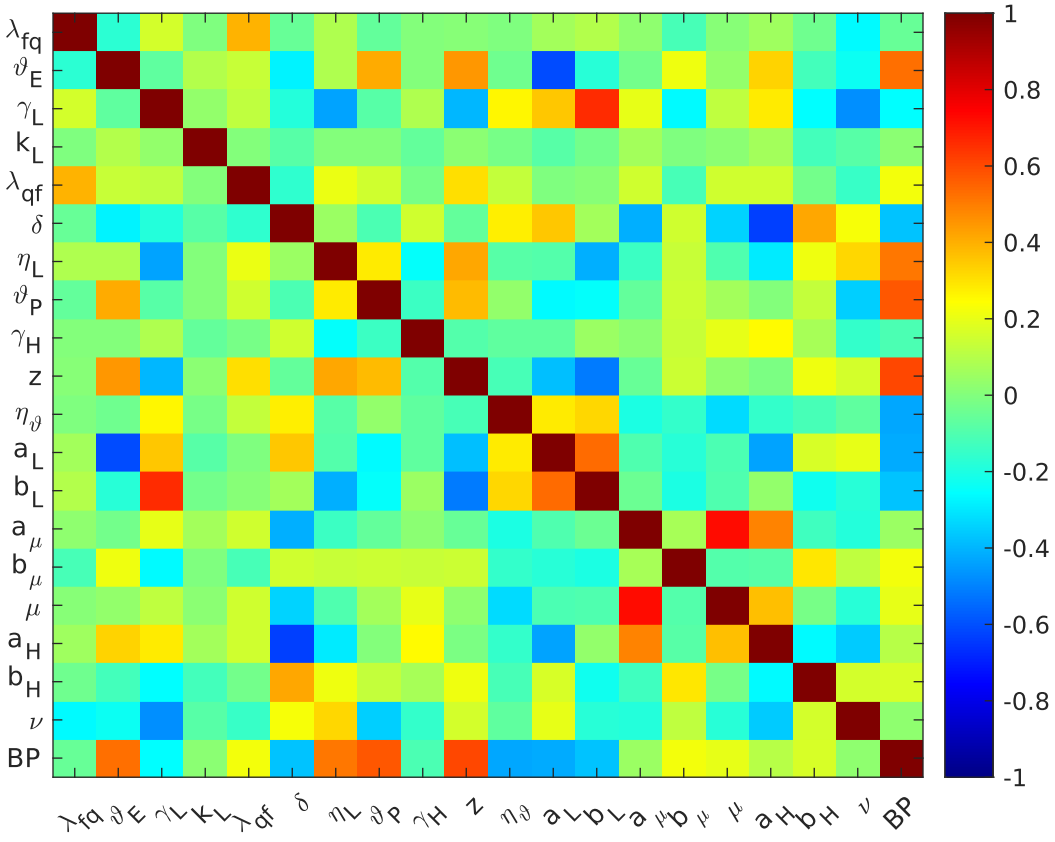
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.014'	'0.04'	'0.008'	'0.0203'	'0.0594'
\vartheta_E	'0.6028'	'0.8285'	'0.5683'	'0.7673'	'0.1187'
\gamma_L	'0.1512'	'0.283'	'0.2668'	'0.2695'	'0.1101'
k_L	'1'	'9.55'	'5.5009'	'5.5082'	'0.0503'
\lambda_{qf}	'0'	'0.0009'	'0.5852'	'0.0004'	'0.085'
\delta	'0.0038'	'0.15'	'0.0746'	'0.0744'	'0.1121'
\eta_L	'0'	'0.0442'	'0.2801'	'0.0196'	'0.1145'
\vartheta_P	'0'	'0.0325'	'0.0438'	'0.0144'	'0.0954'
\gamma_H	'0'	'1'	'0.575'	'0.7697'	'0.0667'
z	'16.5172'	'26.6903'	'17.3205'	'23.4043'	'0.125'
\eta_\vartheta	'0'	'0.2771'	'0.4364'	'0.1336'	'0.0889'
a_L	'1'	'4.0174'	'5.1251'	'1.0135'	'0.1282'
b_L	'4.4841'	'14.3116'	'9.7447'	'4.5029'	'0.1464'
a_\mu	'6.087'	'15'	'8.7763'	'9.4263'	'0.095'
b_\mu	'1'	'14.44'	'7.9916'	'8.9192'	'0.0768'
\mu	'0.02'	'1'	'0.4946'	'0.7356'	'0.0978'
a_H	'1.5544'	'15'	'8.4745'	'8.5195'	'0.1133'
b_H	'1'	'14.44'	'8.1959'	'9.002'	'0.0819'
\nu	'58.9152'	'114.3859'	'156.7575'	'63.0721'	'0.0927'
BP	'383.8835'	'391.4218'	'373.5'	'384.5'	'0.1532'

9.3. 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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0.6
0.4
0.2
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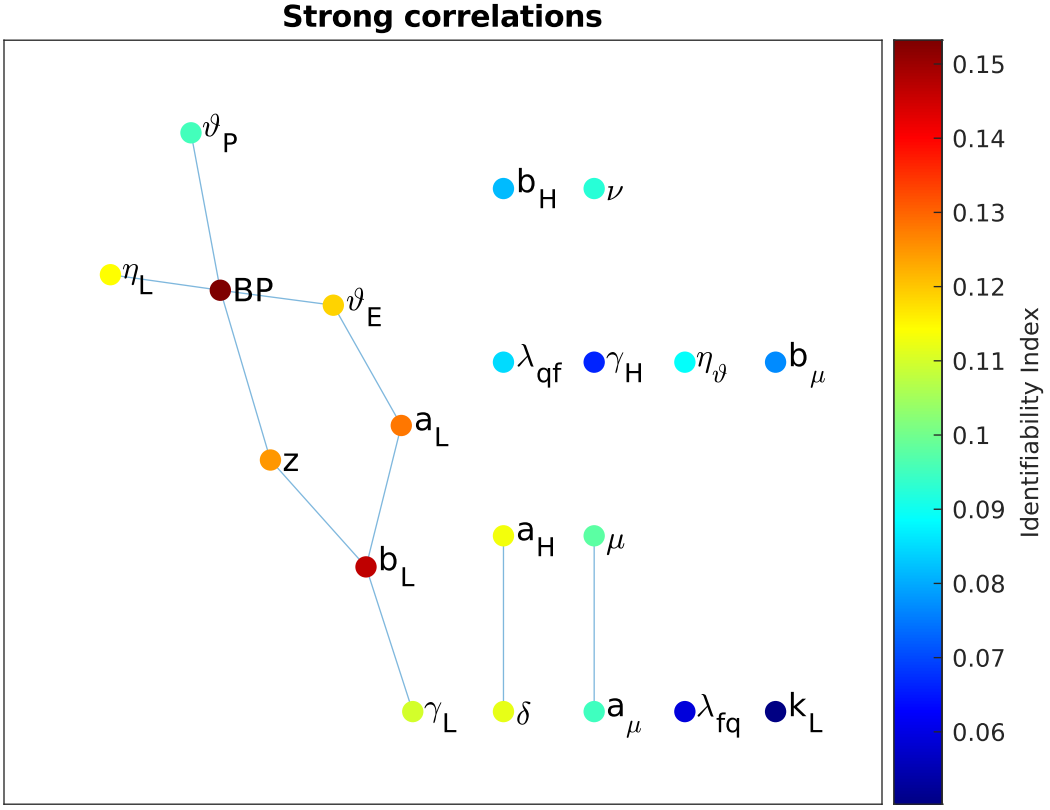
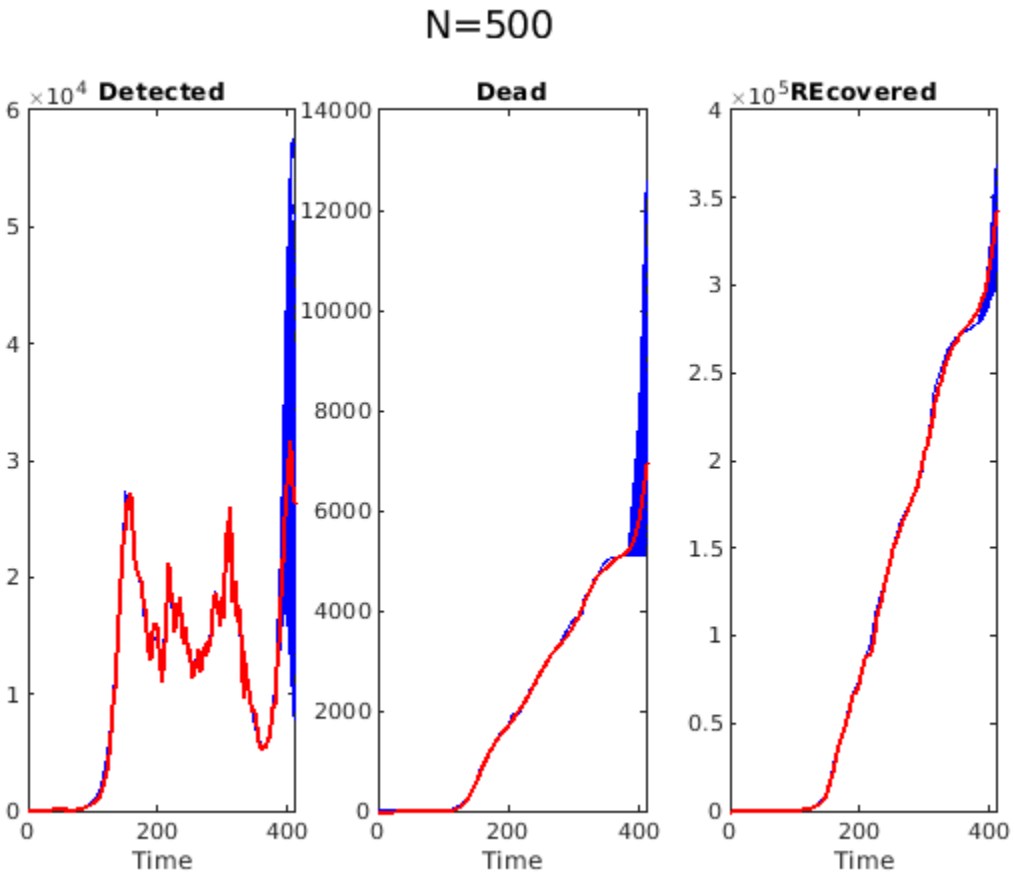
-0.4
-0.6
-0.8
-1


Strong correlations
ϑ_P
b_H
ν
η_L
BP
ϑ_E
λ_{qf}
γ_H
η_ϑ
b_μ
a_L
z
a_H
μ
b_L
γ_L
δ
a_μ
λ_{fq}
k_L
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
Identifiability Index

9.4. Uncertainty analisys



Chapter 10. Extension number10

10.1. Basic information

The extension to be validated consists of the time series from the data411 to the 461. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

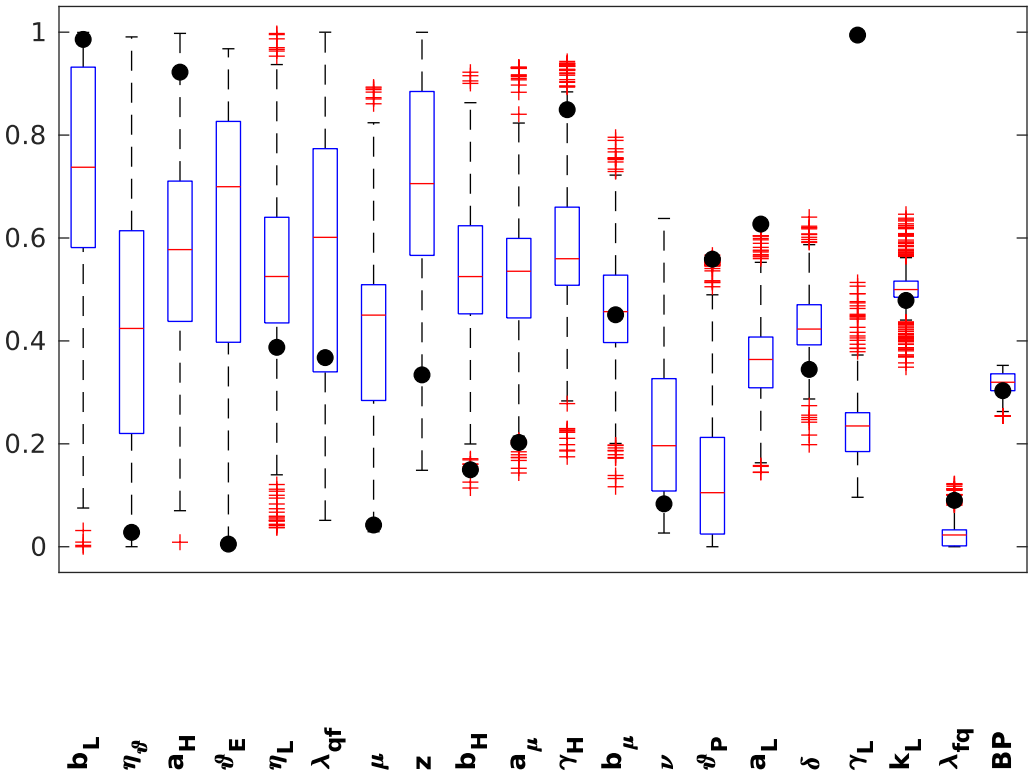
10.2. Estimated parameters with their intervals

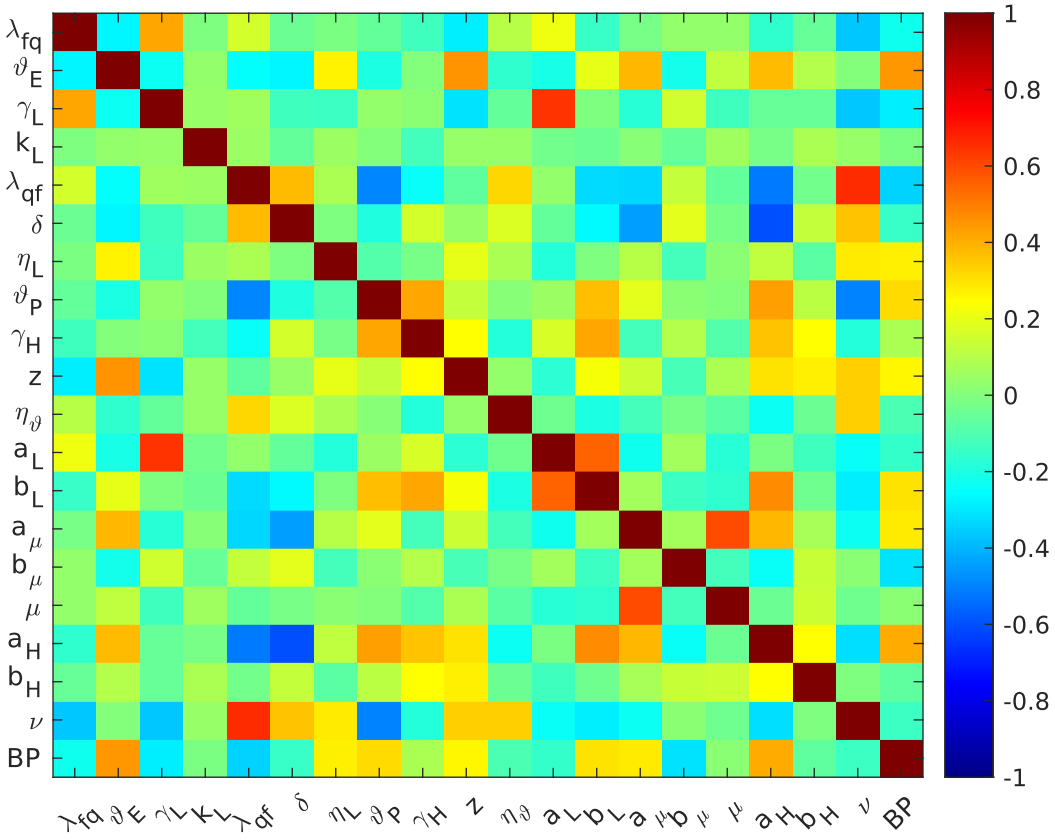
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.071'	'0.1156'	'0.0232'	'0.0901'	'0.0728'
\vartheta_E	'0.0003'	'0.0115'	'0.6997'	'0.0051'	'0.1114'
\gamma_L	'0.3168'	'1'	'0.2348'	'0.9944'	'0.1065'
k_L	'1'	'9.55'	'5.4982'	'5.308'	'0.0504'
\lambda_{qf}	'0.3209'	'0.524'	'0.6013'	'0.3675'	'0.1375'
\delta	'0.0028'	'0.1062'	'0.0635'	'0.0517'	'0.101'
\eta_L	'0.0174'	'0.872'	'0.525'	'0.3875'	'0.0763'
\vartheta_P	'0.461'	'0.6968'	'0.1057'	'0.5589'	'0.1026'
\gamma_H	'0'	'0.893'	'0.5597'	'0.8494'	'0.0903'
z	'8.9089'	'11.9107'	'21.1707'	'10.0196'	'0.0977'
\eta_\vartheta	'0.0016'	'0.0629'	'0.4242'	'0.028'	'0.085'
a_L	'5.8552'	'10.0064'	'6.0948'	'9.779'	'0.105'
b_L	'8.1571'	'15'	'11.3252'	'14.8033'	'0.117'
a_\mu	'1'	'15'	'8.4952'	'3.8366'	'0.11'
b_\mu	'1'	'15'	'7.3962'	'7.3114'	'0.0725'
\mu	'0.0069'	'0.0915'	'0.4502'	'0.0423'	'0.0863'
a_H	'1'	'15'	'9.0844'	'13.9129'	'0.1438'
b_H	'1'	'15'	'8.3505'	'3.0942'	'0.0698'
\nu	'40.4093'	'58.8557'	'98.3544'	'41.6826'	'0.1195'
BP	'402.4872'	'411.5499'	'409.5'	'408.4998'	'0.0815'

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
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0.2
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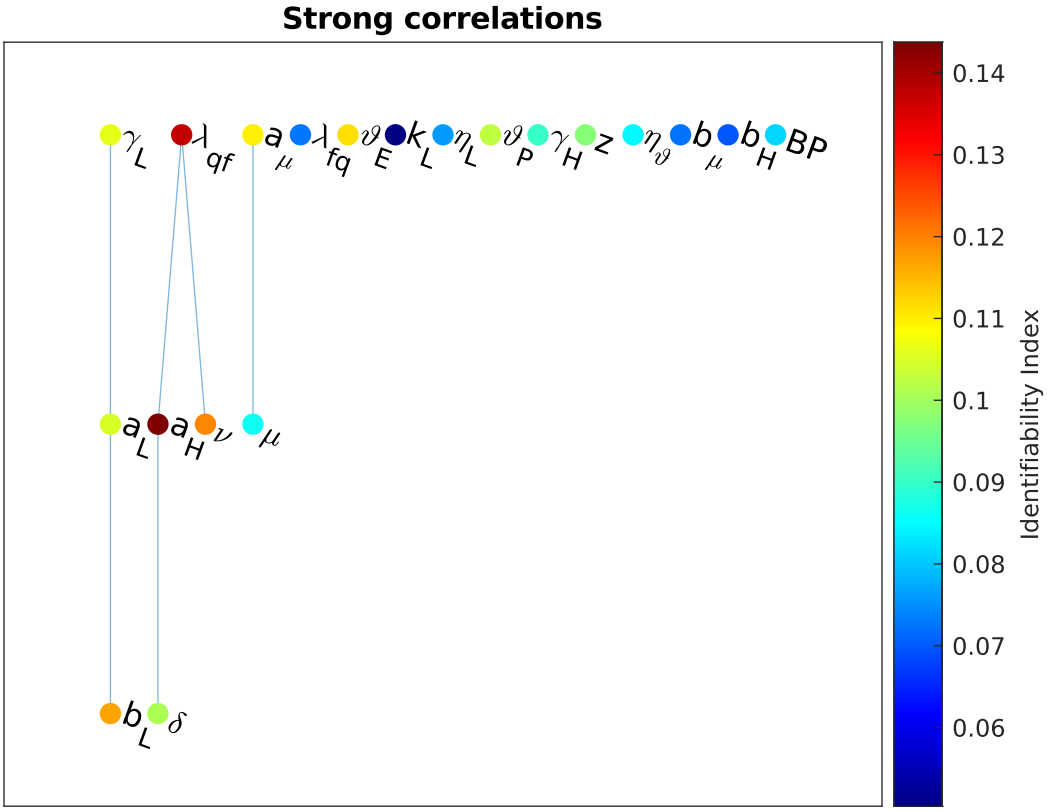
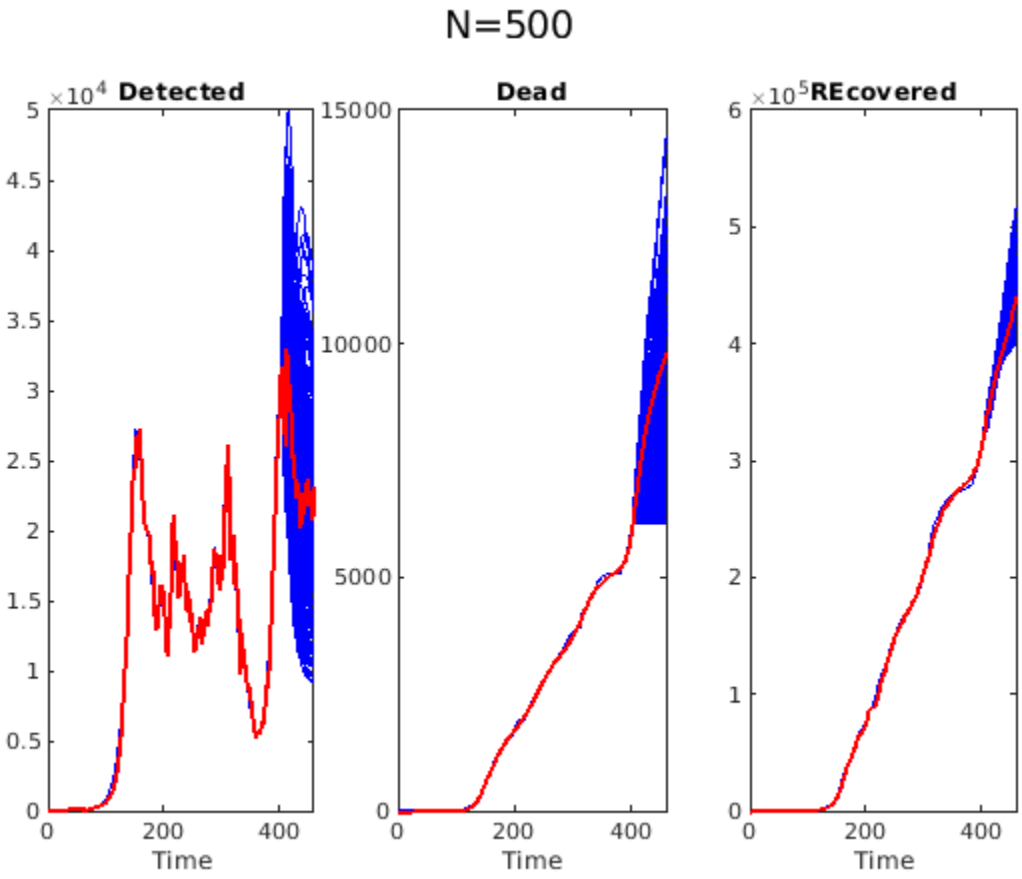
-0.4
-0.6
-0.8
-1


Strong correlations
γ_L
λ_{qf}
a_μ
λ_{fq}
ϑ_E
k_L
η_L
ϑ_P
γ_H
z
η_ϑ
b_μ
b_H
BP
a_L
a_H
ν
μ
b_L
δ
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
Identifiability Index

10.4. Uncertainty analisys



Chapter 11. Extension number11

11.1. Basic information

The extension to be validated consists of the time series from the data461 to the 519. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

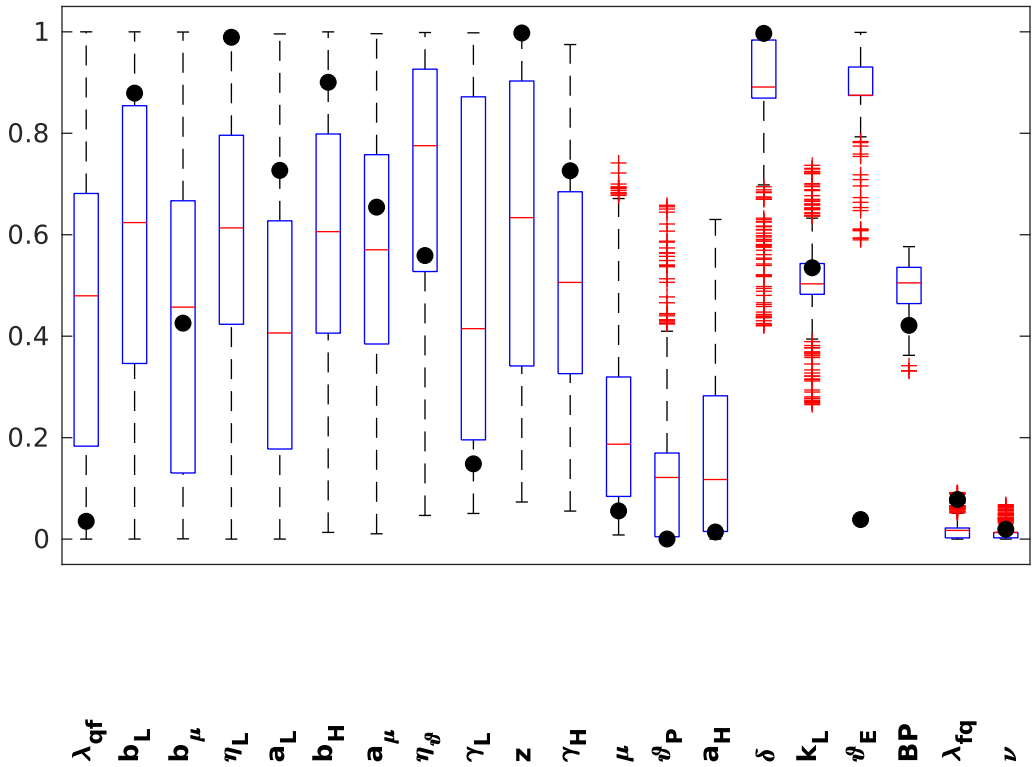
11.2. Estimated parameters with their intervals

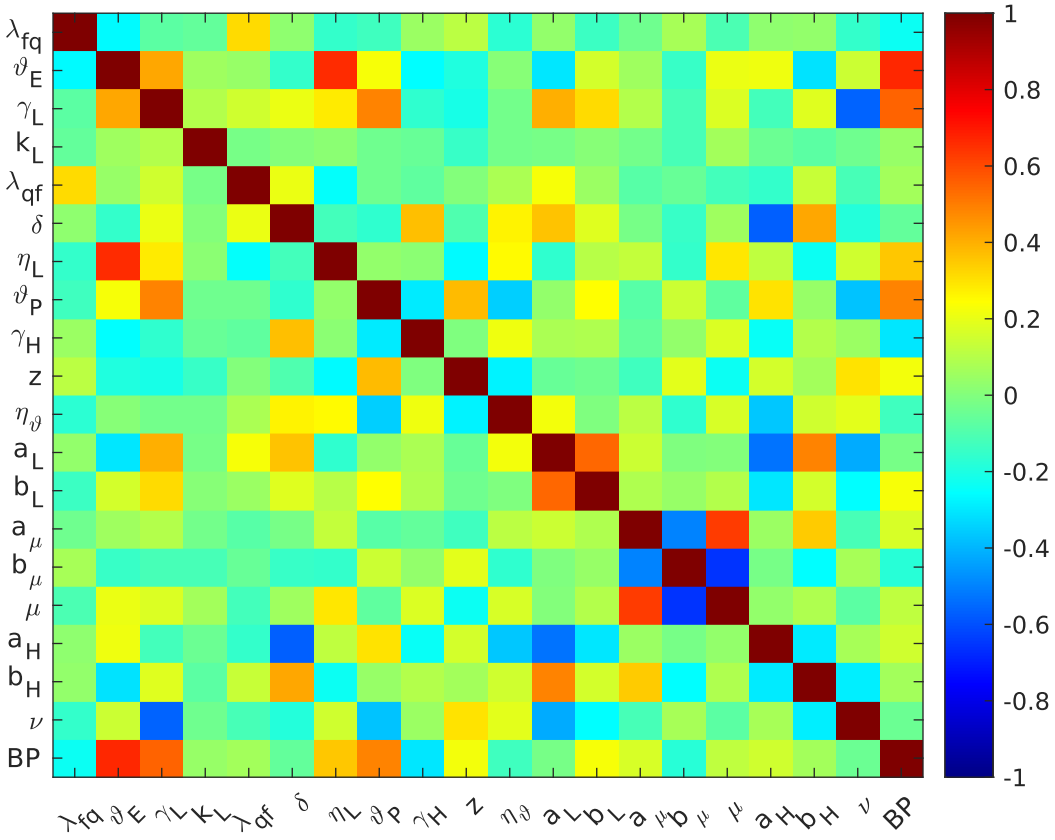
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0705'	'0.0966'	'0.0172'	'0.0781'	'0.0724'
\vartheta_E	'0.0301'	'0.0806'	'0.8746'	'0.0386'	'0.1532'
\gamma_L	'0.0992'	'0.149'	'0.4149'	'0.1484'	'0.1507'
k_L	'1.6107'	'8.0455'	'5.5288'	'5.8137'	'0.0555'
\lambda_{qf}	'0.0128'	'0.0434'	'0.4796'	'0.0351'	'0.0886'
\delta	'0.0583'	'0.15'	'0.1336'	'0.1495'	'0.1238'
\eta_L	'0.4051'	'1'	'0.6135'	'0.9893'	'0.1186'
\vartheta_P	'0.0002'	'0.0005'	'0.1217'	'0.0002'	'0.1119'
\gamma_H	'0.412'	'0.9146'	'0.506'	'0.7261'	'0.0871'
z	'20.5082'	'30'	'19.0108'	'29.9326'	'0.101'
\eta_\vartheta	'0.536'	'0.6571'	'0.7755'	'0.559'	'0.0997'
a_L	'9.7826'	'14.4913'	'6.6895'	'11.1764'	'0.1345'
b_L	'7.2765'	'13.4273'	'9.7357'	'13.308'	'0.1168'
a_\mu	'4.2442'	'14.0535'	'8.9846'	'10.1615'	'0.1075'
b_\mu	'2.2672'	'12.97'	'7.4022'	'6.9601'	'0.1129'
\mu	'0.005'	'0.1126'	'0.188'	'0.0556'	'0.123'
a_H	'1.1487'	'6.2272'	'2.6692'	'1.1955'	'0.1343'
b_H	'3.7759'	'14.414'	'9.4848'	'13.6086'	'0.1069'
\nu	'9.581'	'16.3911'	'6.5503'	'9.7151'	'0.0938'
BP	'452.1979'	'462.3374'	'460.5'	'452.294'	'0.1108'

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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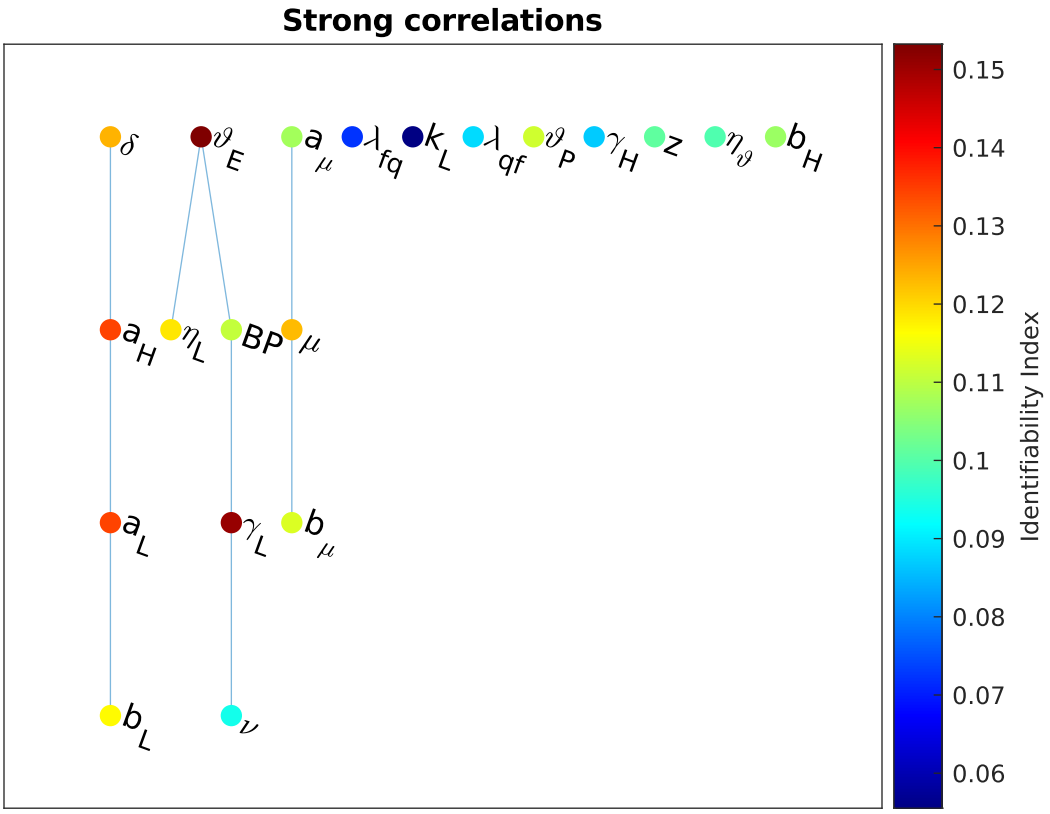
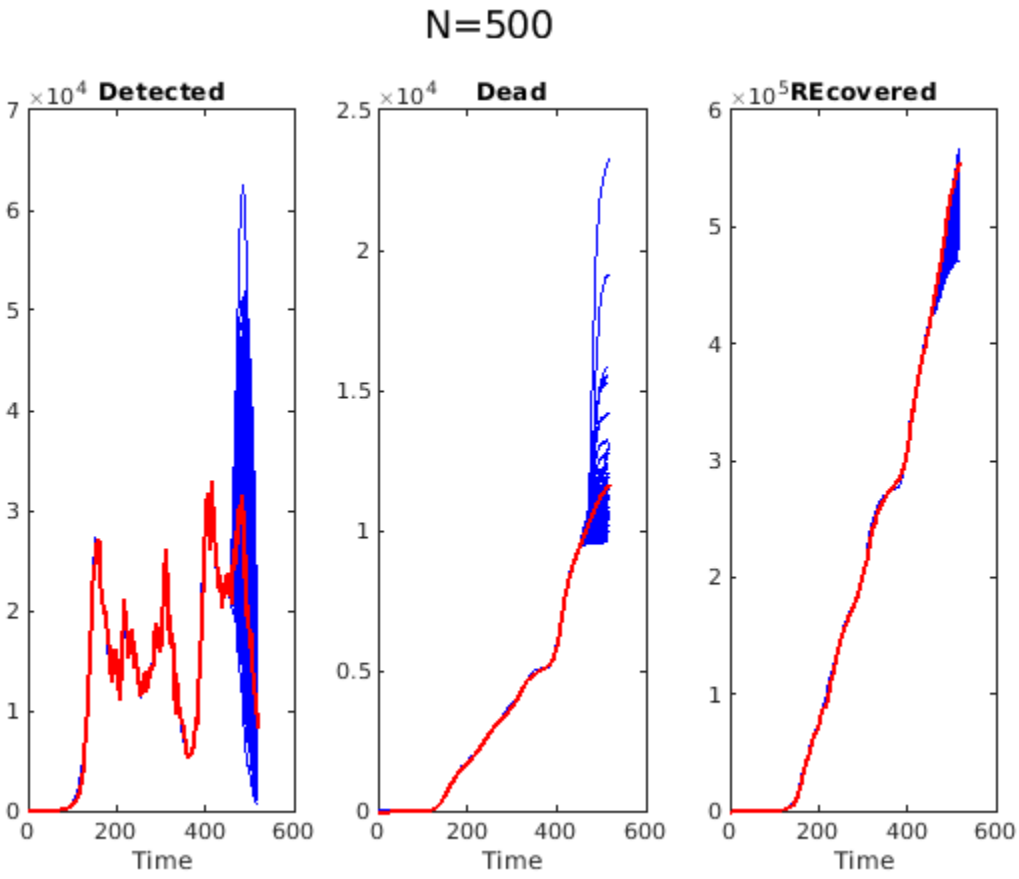
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
δ
ϑ E
a μ
λ fq
k L
λ qf
ϑ P
γ H
z
η ϑ
b H
a H
η L
BP
μ
a L
γ L
b μ
b L
ν
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
Identifiability Index

11.4. Uncertainty analisys



Chapter 12. Extension number12

12.1. Basic information

The extension to be validated consists of the time series from the data519 to the 604. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

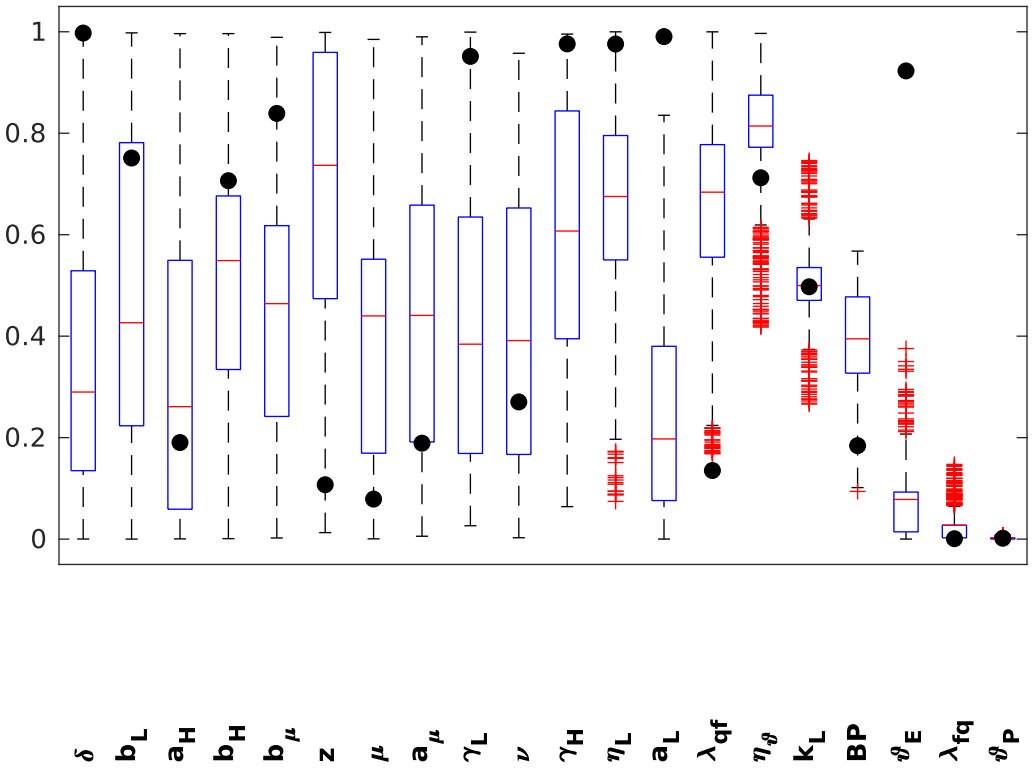
12.2. Estimated parameters with their intervals

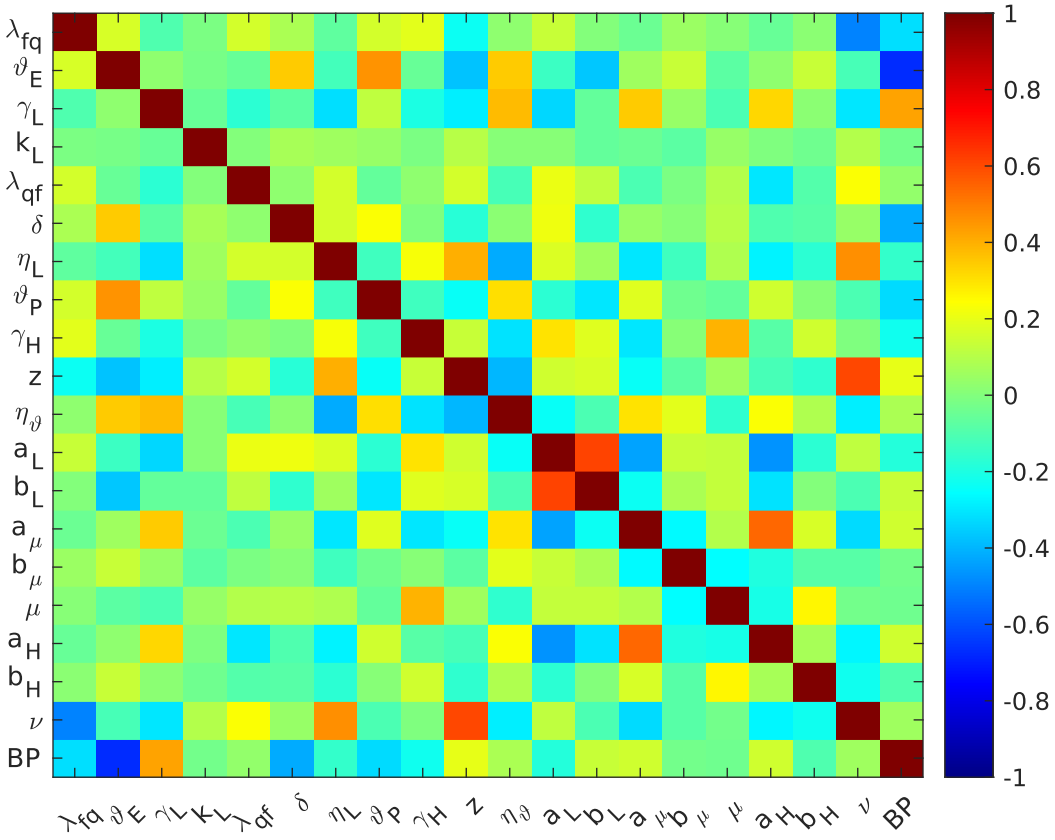
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0015'	'0.0274'	'0.0008'	'0.0741'
\vartheta_E	'0.9008'	'0.9242'	'0.0782'	'0.9229'	'0.1194'
\gamma_L	'0.4793'	'0.9722'	'0.3842'	'0.9514'	'0.1013'
k_L	'1.3845'	'9.64'	'5.4983'	'5.4761'	'0.0515'
\lambda_{qf}	'0.1351'	'0.6125'	'0.6837'	'0.1352'	'0.076'
\delta	'0.0345'	'0.15'	'0.0435'	'0.1496'	'0.0845'
\eta_L	'0.5403'	'1'	'0.6751'	'0.9758'	'0.1002'
\vartheta_P	'0.0006'	'0.0036'	'0.0014'	'0.0017'	'0.0662'
\gamma_H	'0.2886'	'1'	'0.6072'	'0.9761'	'0.0905'
z	'2.6948'	'3.3515'	'22.1026'	'3.2141'	'0.1224'
\eta_\vartheta	'0.5674'	'0.8651'	'0.8142'	'0.7122'	'0.0975'
a_L	'12.143'	'14.8857'	'3.7646'	'14.8668'	'0.1198'
b_L	'9.4784'	'14.3356'	'6.9702'	'11.5157'	'0.1119'
a_\mu	'2.024'	'15'	'7.1727'	'3.6472'	'0.1193'
b_\mu	'1'	'13.88'	'7.4974'	'12.7477'	'0.0758'
\mu	'0'	'0.157'	'0.4399'	'0.0789'	'0.0827'
a_H	'1.623'	'14.3312'	'4.6547'	'3.6646'	'0.1193'
b_H	'1.35'	'15'	'8.6858'	'10.8904'	'0.0795'
\nu	'133.8166'	'166.8816'	'195.6555'	'135.1882'	'0.1168'
BP	'482.0697'	'489.72'	'513.5'	'485.4998'	'0.0954'

12.3. 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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0.4
0.2
0
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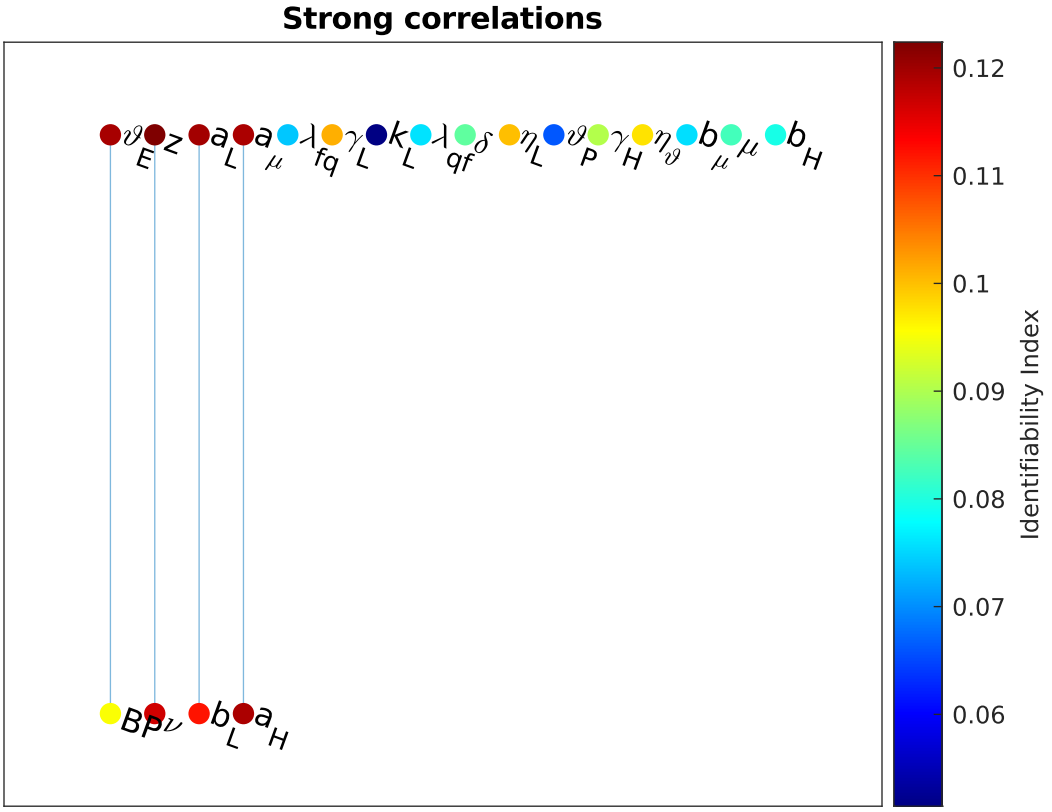
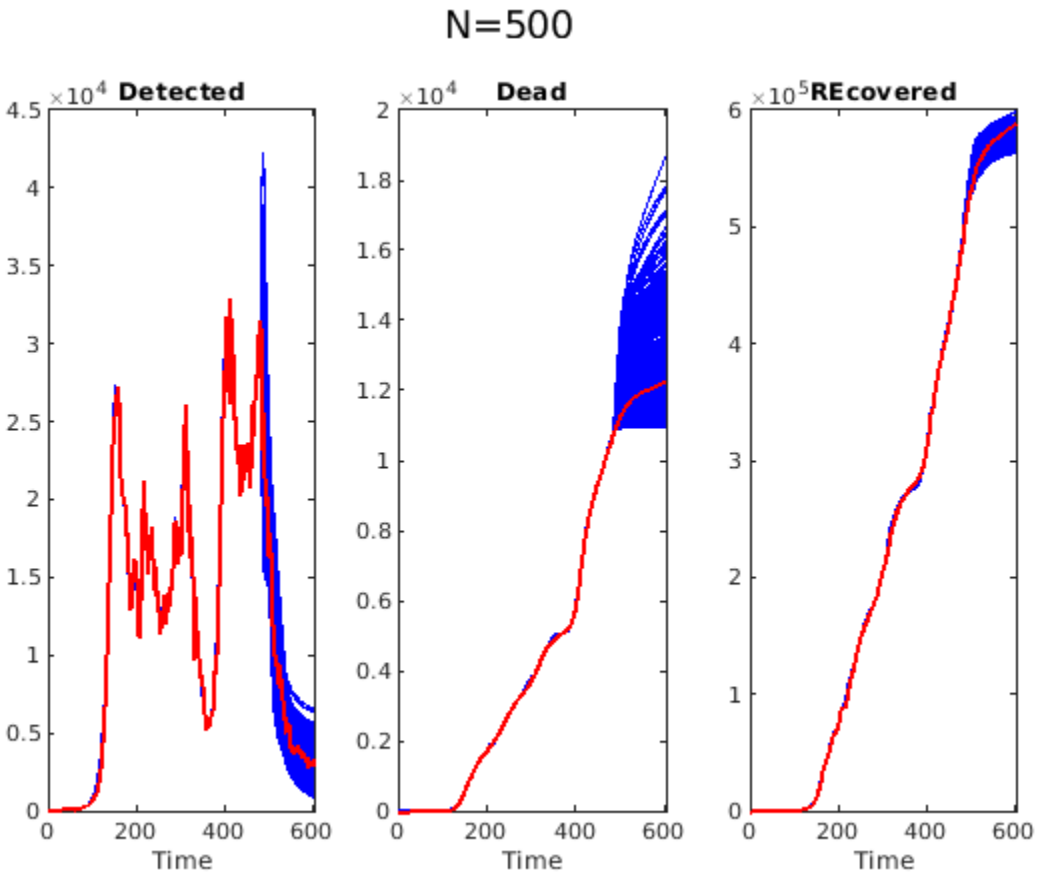
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.12
0.11
0.1
0.09
0.08
0.07
0.06

12.4. Uncertainty analisys



Chapter 13. Extension number13

13.1. Basic information

The extension to be validated consists of the time series from the data604 to the 725. The status of the validation is: COMPLETED.

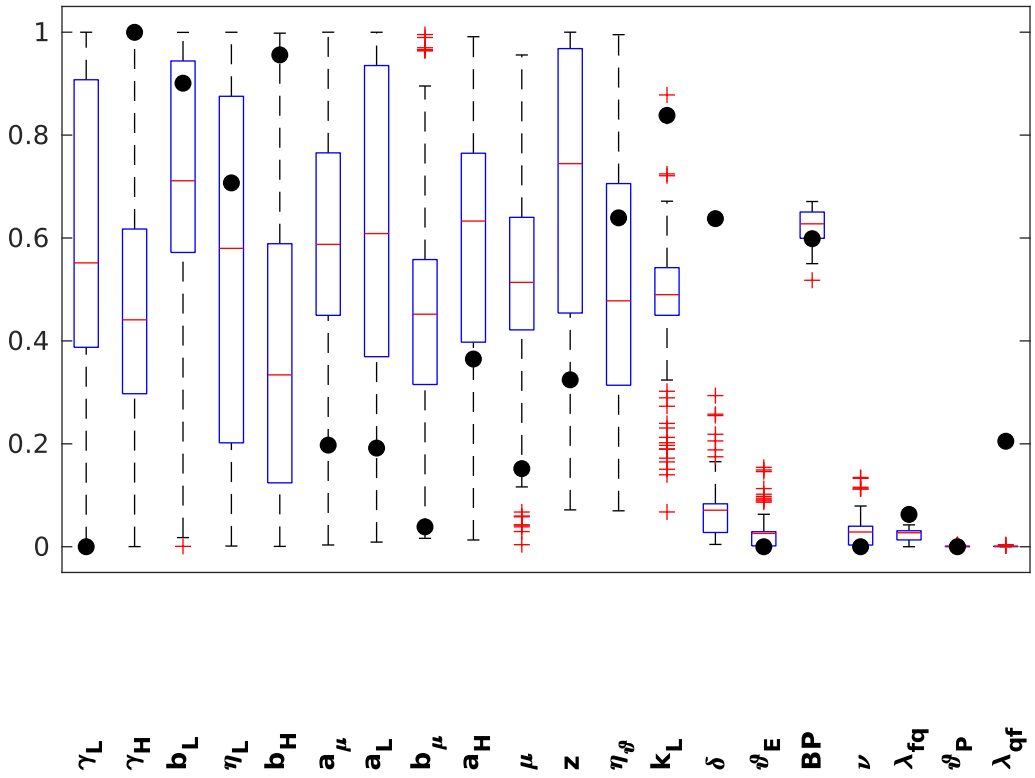
The number of estimations needed to perform the validation was2000.

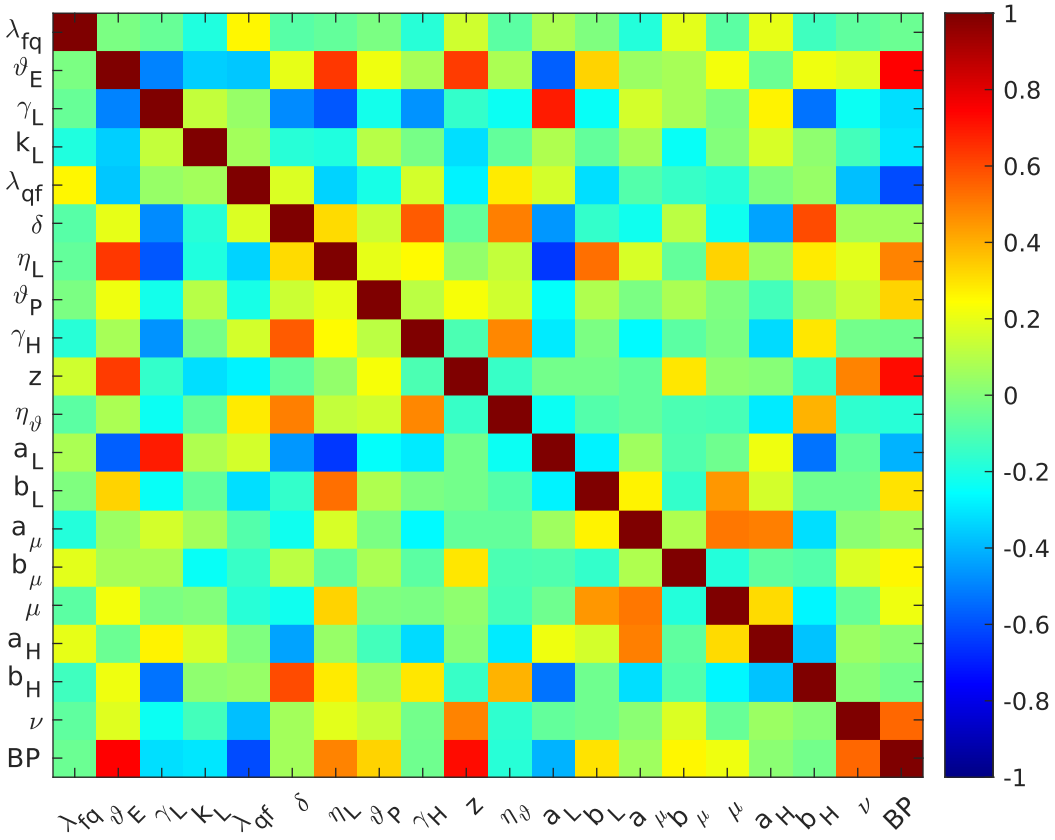
13.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0019'	'0.0525'	'0.0272'	'0.0628'	'0.0758'
\vartheta_E	'0'	'0.0754'	'0.0292'	'0'	'0.1813'
\gamma_L	'0.4832'	'0.6201'	'0.5517'	'0'	'0.198'
k_L	'4.9164'	'5.9008'	'5.4086'	'8.545'	'0.1133'
\lambda_{qf}	'0'	'0.0767'	'0.0008'	'0.205'	'0.127'
\delta	'0.0011'	'0.0203'	'0.0107'	'0.0956'	'0.1768'
\eta_L	'0.4964'	'0.6634'	'0.5799'	'0.7071'	'0.2271'
\vartheta_P	'0'	'0.0113'	'0.0009'	'0'	'0.0637'
\gamma_H	'0.3721'	'0.5099'	'0.441'	'0.9997'	'0.1531'
z	'20.3242'	'24.3477'	'22.336'	'9.7331'	'0.1657'
\eta_\vartheta	'0.4128'	'0.5431'	'0.4779'	'0.6392'	'0.137'
a_L	'8.5001'	'10.5413'	'9.5207'	'3.6845'	'0.2124'
b_L	'10.1464'	'11.7694'	'10.9579'	'13.6122'	'0.1396'
a_\mu	'8.3188'	'10.1349'	'9.2268'	'3.765'	'0.1417'
b_\mu	'6.4974'	'8.1564'	'7.3269'	'1.5416'	'0.1162'
\mu	'0.4569'	'0.5707'	'0.5138'	'0.1518'	'0.1347'
a_H	'9.0089'	'10.713'	'9.8609'	'6.1076'	'0.1309'
b_H	'4.6717'	'6.6798'	'5.6757'	'14.3823'	'0.1889'
\nu	'7.9435'	'20.9074'	'14.4255'	'0.0001'	'0.0878'
BP	'640.3809'	'643.6191'	'642'	'636.3398'	'0.1542'

13.3. 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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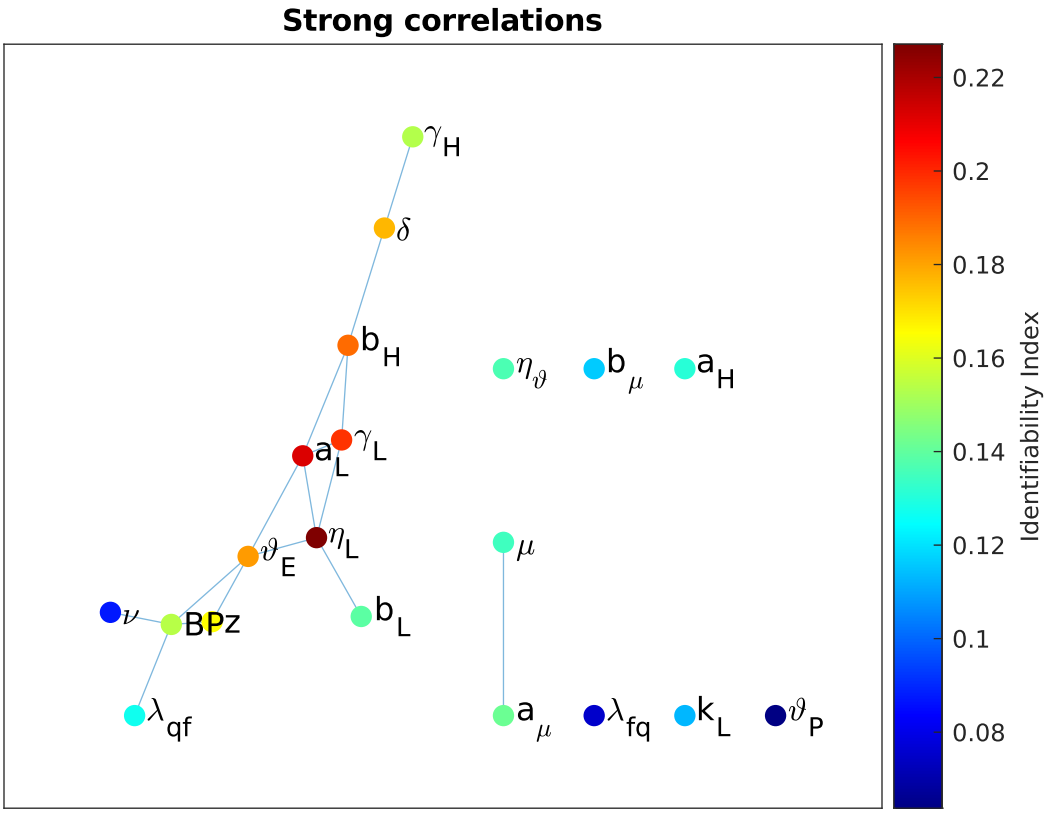
-0.4
-0.6
-0.8
-1


Strong correlations
γ_H
δ
b_H
η_ϑ
b_μ
a_H
a_L
γ_L
ϑ_E
η_L
μ
ν
BPz
b_L
λ_{qf}
a_μ
λ_{fq}
k_L
ϑ_P
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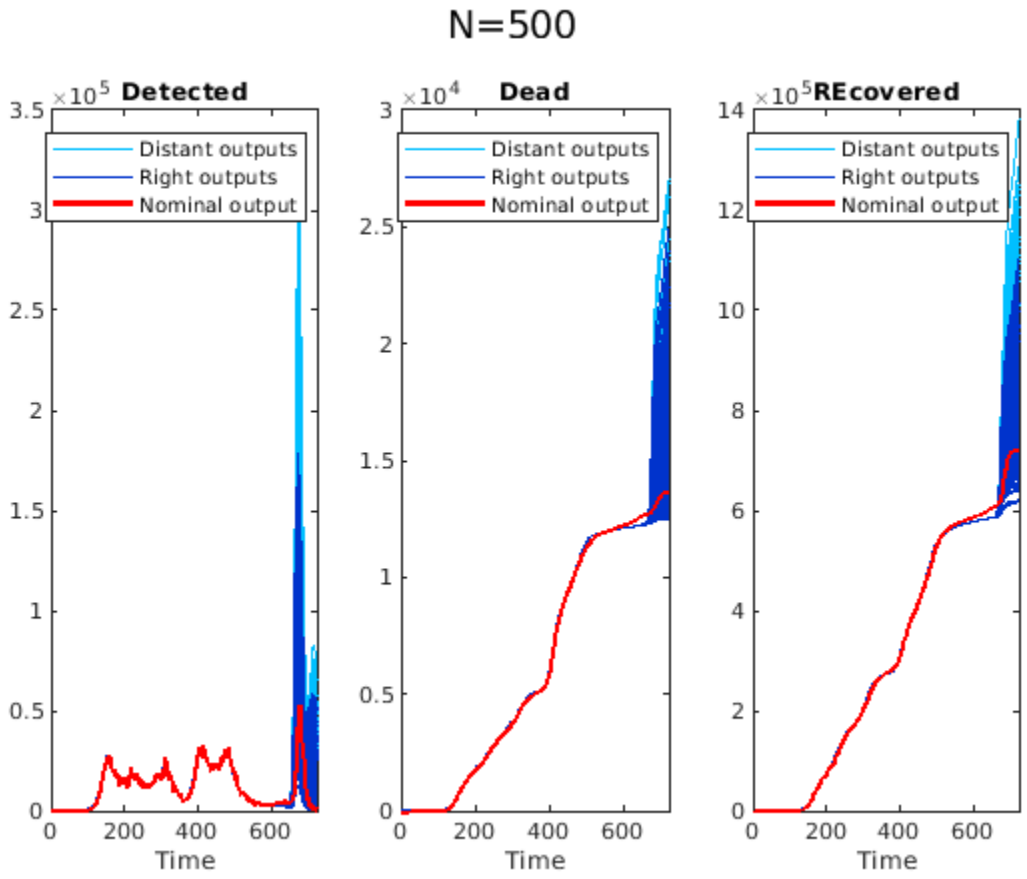
0.14
0.12
0.1
0.08
Identifiability Index

13.4. Uncertainty analisys