Validation process forBOGOTA, D.C.

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 82. The status of the validation is: COMPLETED.

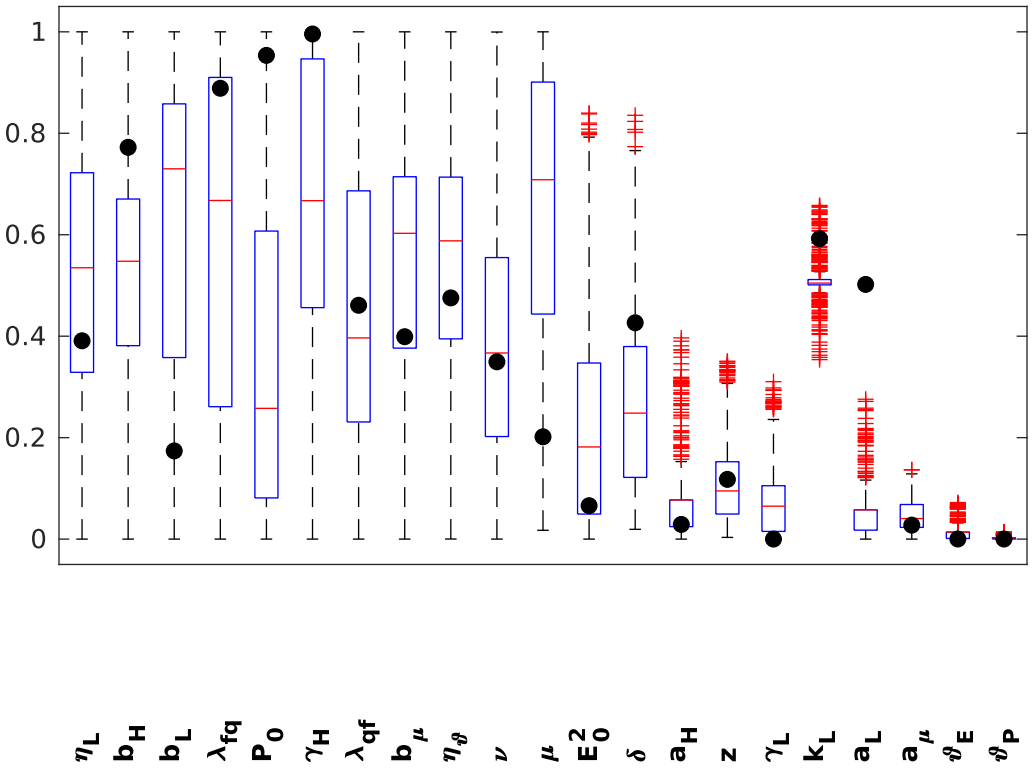
The number of estimations needed to perform the validation was1000.

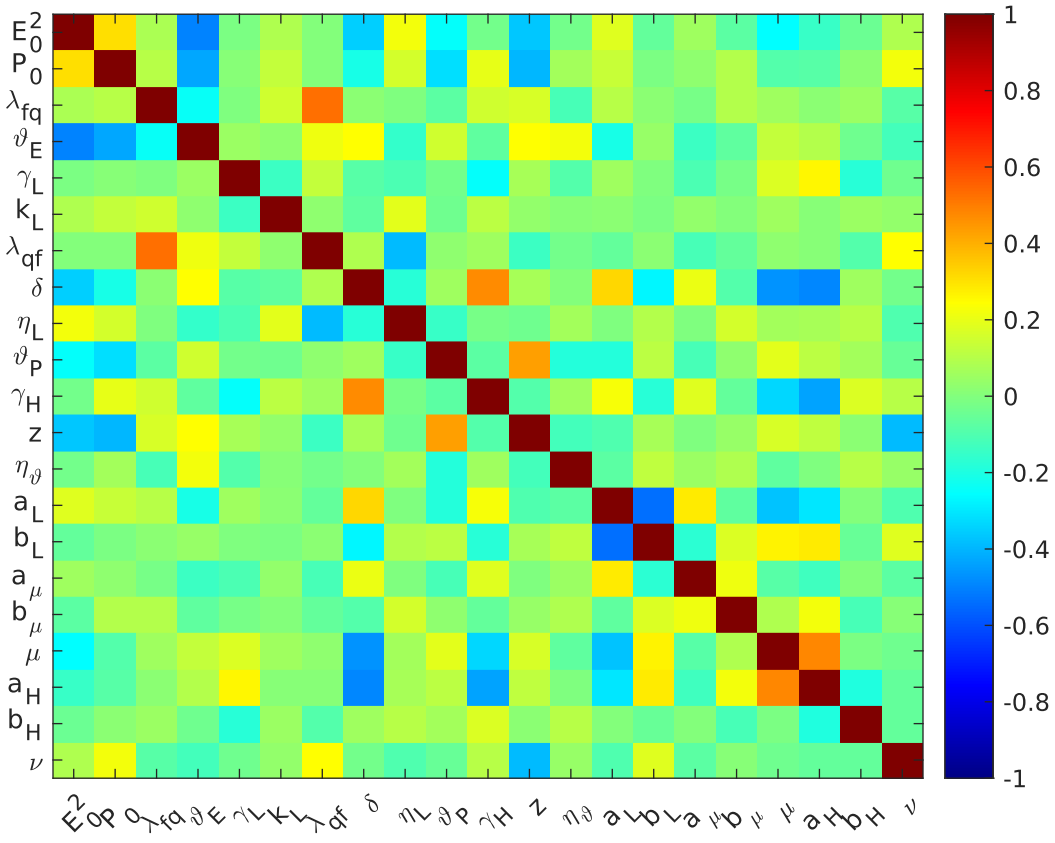
1.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
E^2_0	'301.4357'	'425.1737'	'363.3047'	'131.7418'	'0.092'
P_0	'88.8922'	'117.3112'	'103.1017'	'381.4317'	'0.0954'
\lambda_{fq}	'0.6267'	'0.7084'	'0.6675'	'0.8887'	'0.1014'
\vartheta_E	'0'	'0.0467'	'0.0138'	'0.0002'	'0.0872'
\gamma_L	'0.0472'	'0.0826'	'0.0649'	'0.0001'	'0.0628'
k_L	'5.3153'	'5.7686'	'5.542'	'6.3298'	'0.0637'
\lambda_{qf}	'0.3611'	'0.4321'	'0.3966'	'0.4609'	'0.0981'
\delta	'0.0334'	'0.0411'	'0.0373'	'0.064'	'0.0941'
\eta_L	'0.5019'	'0.5678'	'0.5349'	'0.3909'	'0.0837'
\vartheta_P	'0'	'0.023'	'0.0025'	'0.0002'	'0.0665'
\gamma_H	'0.632'	'0.7023'	'0.6671'	'0.9957'	'0.0979'
z	'2.3228'	'3.3749'	'2.8489'	'3.5325'	'0.0781'
\eta_\vartheta	'0.5618'	'0.6141'	'0.588'	'0.4755'	'0.0682'
a_L	'1.3345'	'2.2816'	'1.8081'	'8.0293'	'0.1093'
b_L	'10.6973'	'11.7407'	'11.219'	'3.4338'	'0.1048'
a_\mu	'1.4693'	'1.6646'	'1.5669'	'1.3856'	'0.0548'
b_\mu	'9.0198'	'9.8588'	'9.4393'	'6.5859'	'0.0749'
\mu	'0.6766'	'0.7403'	'0.7085'	'0.2017'	'0.0963'
a_H	'1.6319'	'2.529'	'2.0804'	'1.4052'	'0.0978'
b_H	'8.2608'	'9.0752'	'8.668'	'11.8129'	'0.0698'
\nu	'169.5544'	'197.3228'	'183.4386'	'174.7406'	'0.0761'

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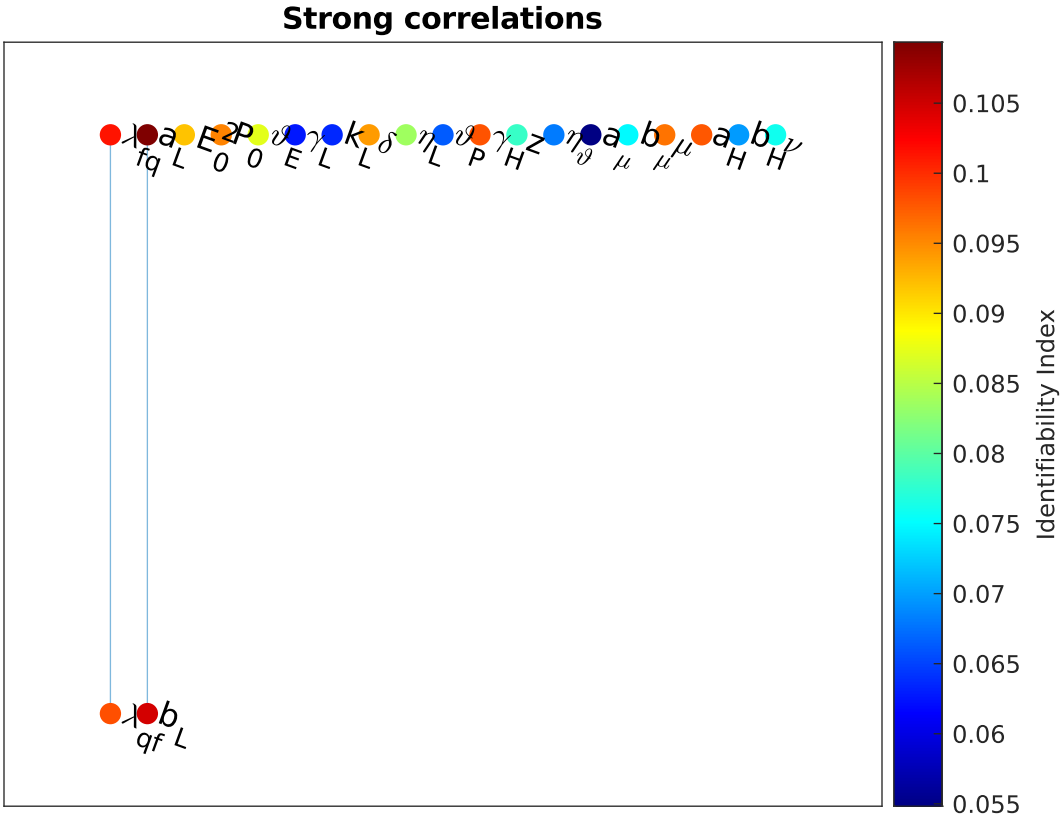
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
0.105
0.1
0.095
0.09
0.085
0.08
0.075
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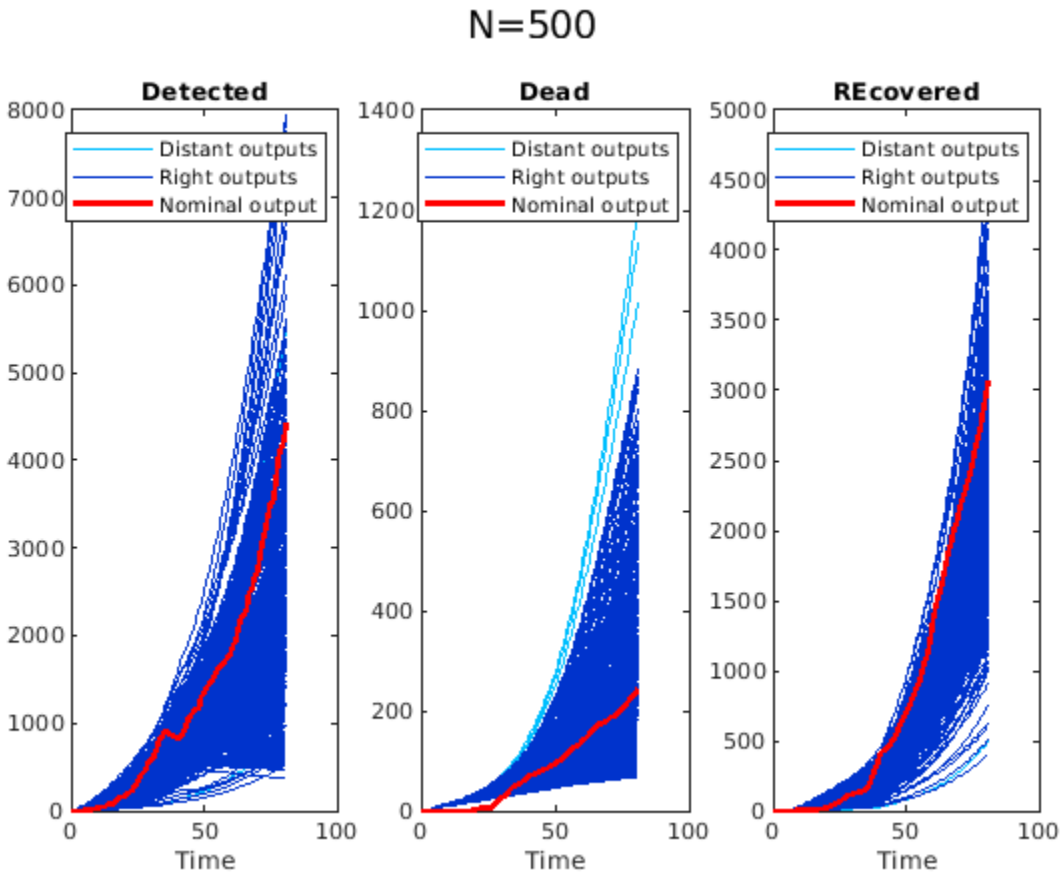
0.065
0.06
0.055
Identifiability Index

1.4. Uncertainty analisys



Chapter 2. Extension number2

2.1. Basic information

The extension to be validated consists of the time series from the data82 to the 120. The status of the validation is: COMPLETED.

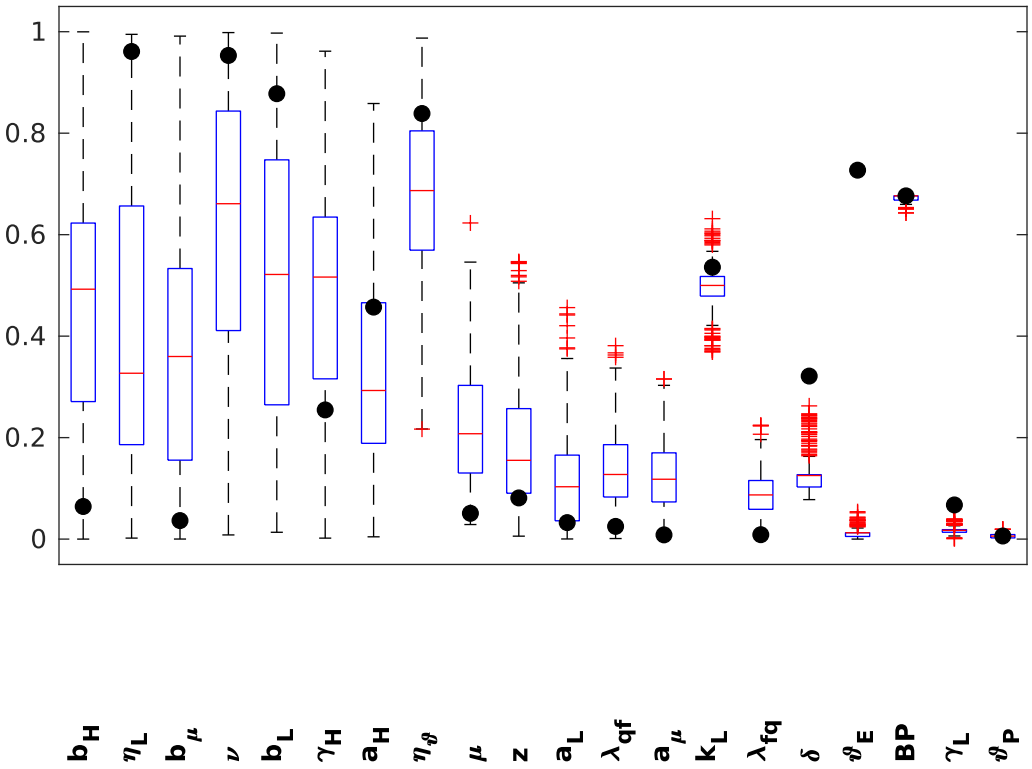
The number of estimations needed to perform the validation was1000.

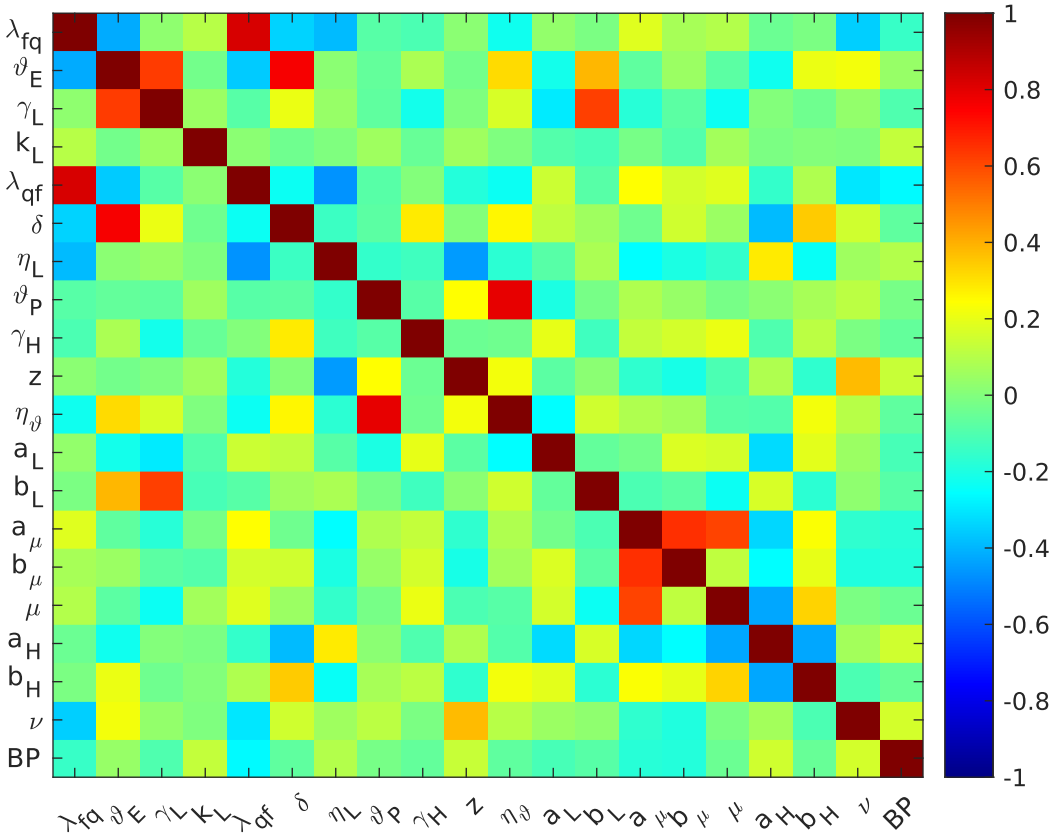
2.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.071'	'0.1032'	'0.0871'	'0.0087'	'0.0971'
\vartheta_E	'0'	'0.0489'	'0.0125'	'0.7271'	'0.1265'
\gamma_L	'0.0144'	'0.0203'	'0.0173'	'0.0673'	'0.091'
k_L	'5.3681'	'5.6307'	'5.4994'	'5.8227'	'0.0513'
\lambda_{qf}	'0.1038'	'0.1509'	'0.1274'	'0.0251'	'0.1124'
\delta	'0.0136'	'0.0239'	'0.0188'	'0.0482'	'0.1183'
\eta_L	'0.2816'	'0.3721'	'0.3269'	'0.961'	'0.1127'
\vartheta_P	'0.005'	'0.0067'	'0.0058'	'0.0061'	'0.0668'
\gamma_H	'0.4817'	'0.5512'	'0.5164'	'0.2546'	'0.0864'
z	'3.7744'	'5.5403'	'4.6574'	'2.4348'	'0.0869'
\eta_\vartheta	'0.6599'	'0.7139'	'0.6869'	'0.8388'	'0.1089'
a_L	'1.9422'	'2.9468'	'2.4445'	'1.4549'	'0.0958'
b_L	'7.7134'	'8.8904'	'8.3019'	'13.2893'	'0.1119'
a_\mu	'2.4934'	'2.8099'	'2.6516'	'1.1166'	'0.1083'
b_\mu	'5.5153'	'6.5611'	'6.0382'	'1.511'	'0.1137'
\mu	'0.1769'	'0.2384'	'0.2077'	'0.0508'	'0.1086'
a_H	'4.6097'	'5.591'	'5.1003'	'7.4009'	'0.1043'
b_H	'7.4106'	'8.3802'	'7.8954'	'1.8998'	'0.0997'
\nu	'311.0264'	'349.9639'	'330.4951'	'476.6028'	'0.0952'
BP	'81.3205'	'81.6795'	'81.5'	'81.5'	'0.0526'

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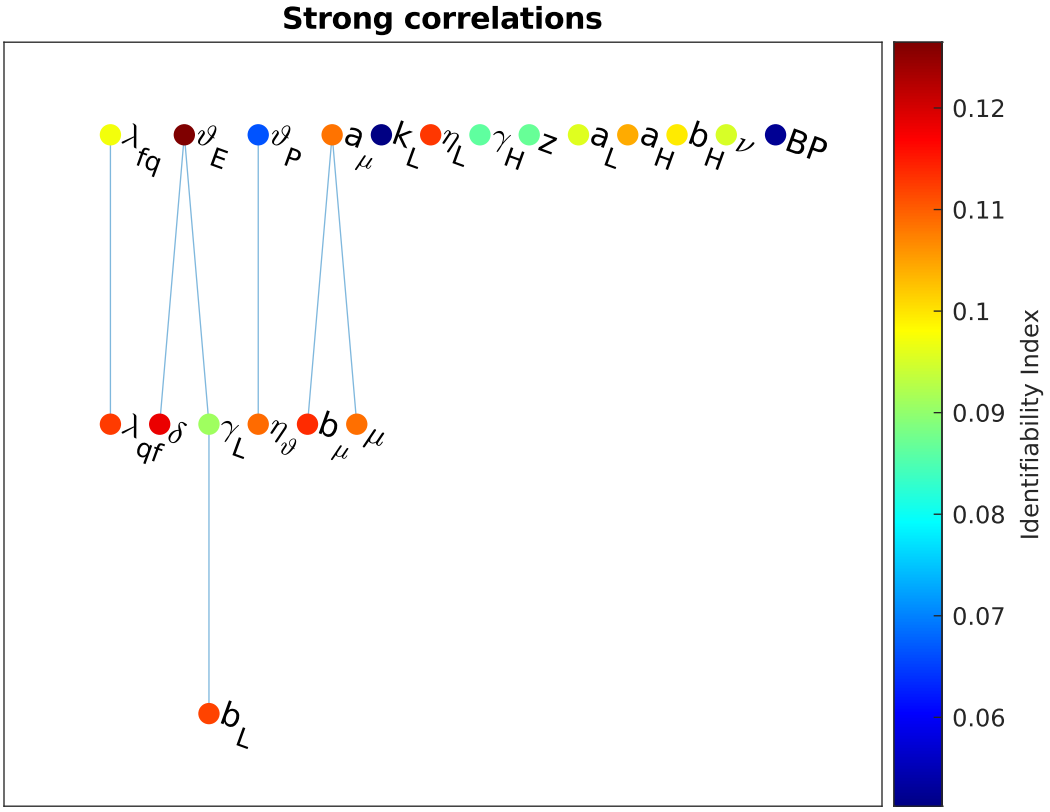
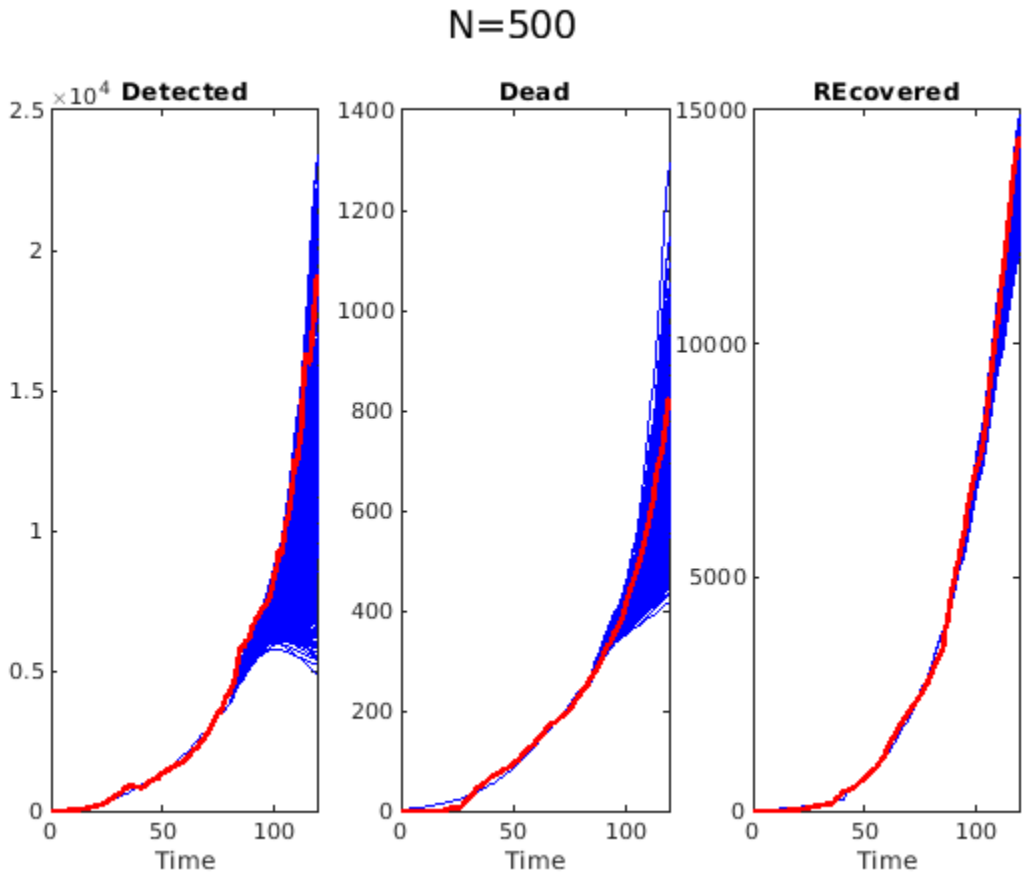
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


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 data120 to the 160. The status of the validation is: COMPLETED.

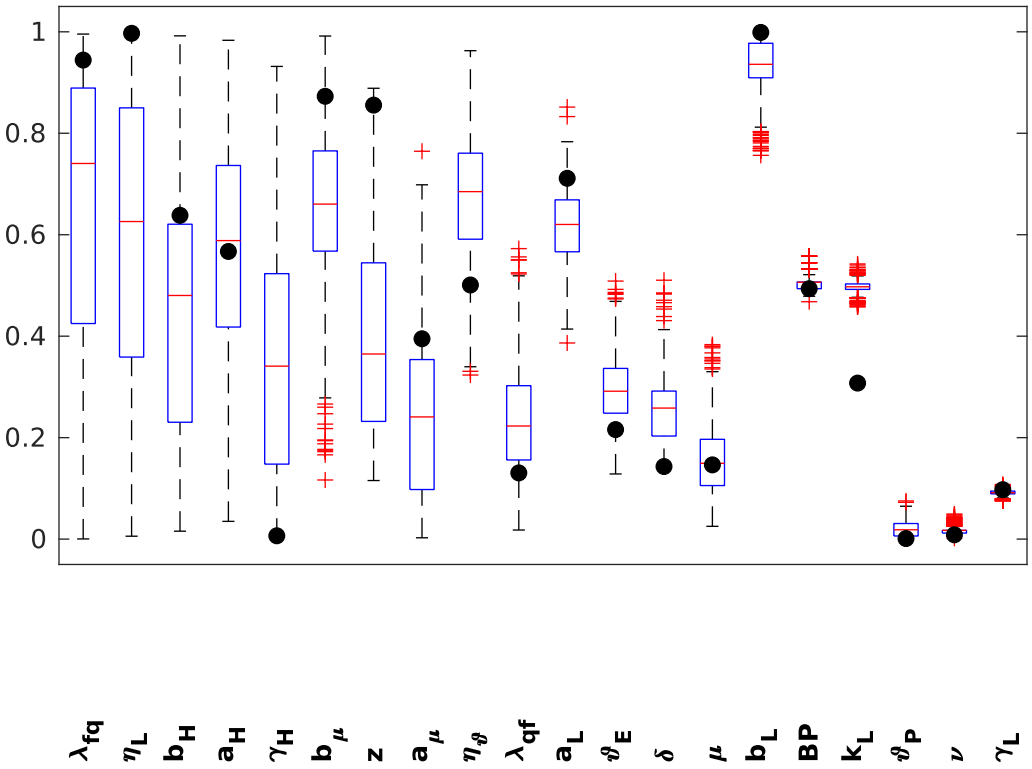
The number of estimations needed to perform the validation was1000.

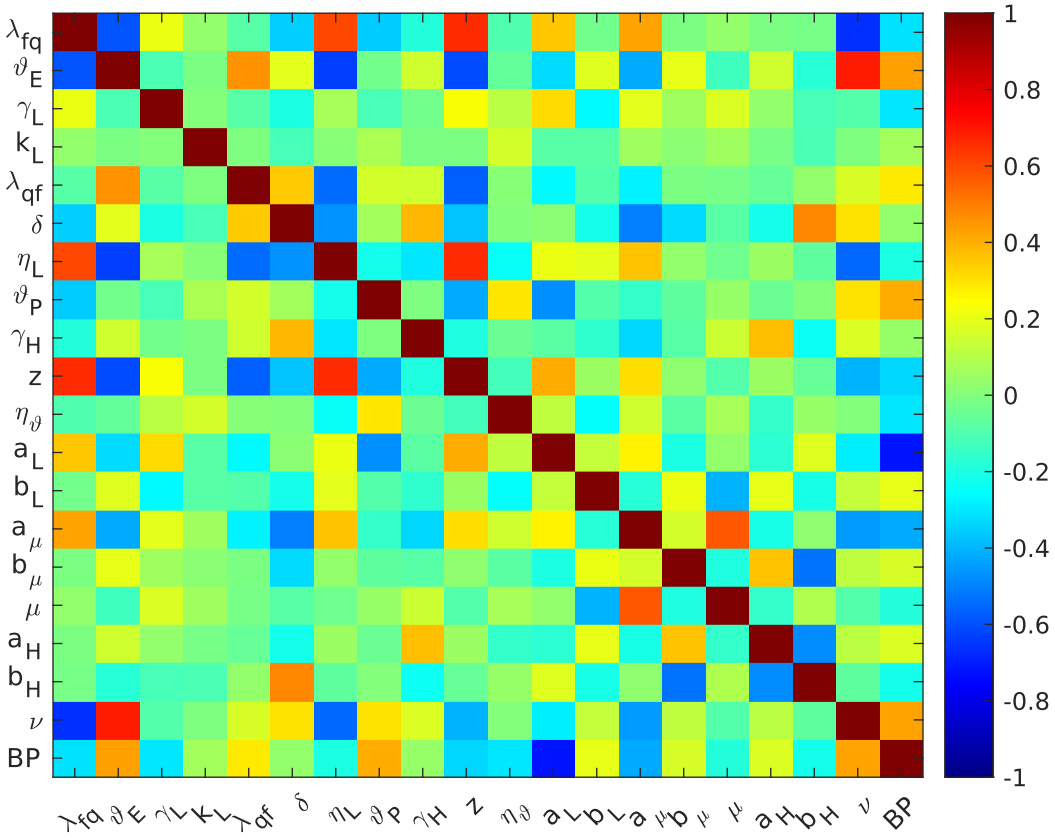
3.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.7013'	'0.7796'	'0.7405'	'0.9443'	'0.1768'
\vartheta_E	'0.277'	'0.306'	'0.2915'	'0.2159'	'0.1585'
\gamma_L	'0.0892'	'0.0937'	'0.0915'	'0.0974'	'0.0611'
k_L	'5.4021'	'5.5501'	'5.4761'	'3.7676'	'0.045'
\lambda_{qf}	'0.2005'	'0.2453'	'0.2229'	'0.1305'	'0.1172'
\delta	'0.0343'	'0.0432'	'0.0387'	'0.0215'	'0.1256'
\eta_L	'0.5846'	'0.6674'	'0.626'	'0.997'	'0.197'
\vartheta_P	'0.0131'	'0.0237'	'0.0184'	'0.0011'	'0.0719'
\gamma_H	'0.3073'	'0.3746'	'0.341'	'0.0065'	'0.097'
z	'10.0859'	'11.8065'	'10.9462'	'25.6645'	'0.1734'
\eta_\vartheta	'0.6621'	'0.7077'	'0.6849'	'0.5009'	'0.0769'
a_L	'9.4719'	'9.8944'	'9.6832'	'10.9572'	'0.1105'
b_L	'13.8377'	'14.3683'	'14.103'	'14.9829'	'0.0845'
a_\mu	'4.0599'	'4.6841'	'4.372'	'6.529'	'0.1405'
b_\mu	'9.7585'	'10.7315'	'10.245'	'13.2204'	'0.1079'
\mu	'0.1314'	'0.1675'	'0.1494'	'0.1463'	'0.0882'
a_H	'8.8341'	'9.6422'	'9.2381'	'8.9383'	'0.0915'
b_H	'7.206'	'8.2406'	'7.7233'	'9.9356'	'0.1135'
\nu	'0'	'18.2109'	'8.6161'	'4.2361'	'0.1435'
BP	'121.2409'	'121.7591'	'121.5'	'120.5'	'0.1058'

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
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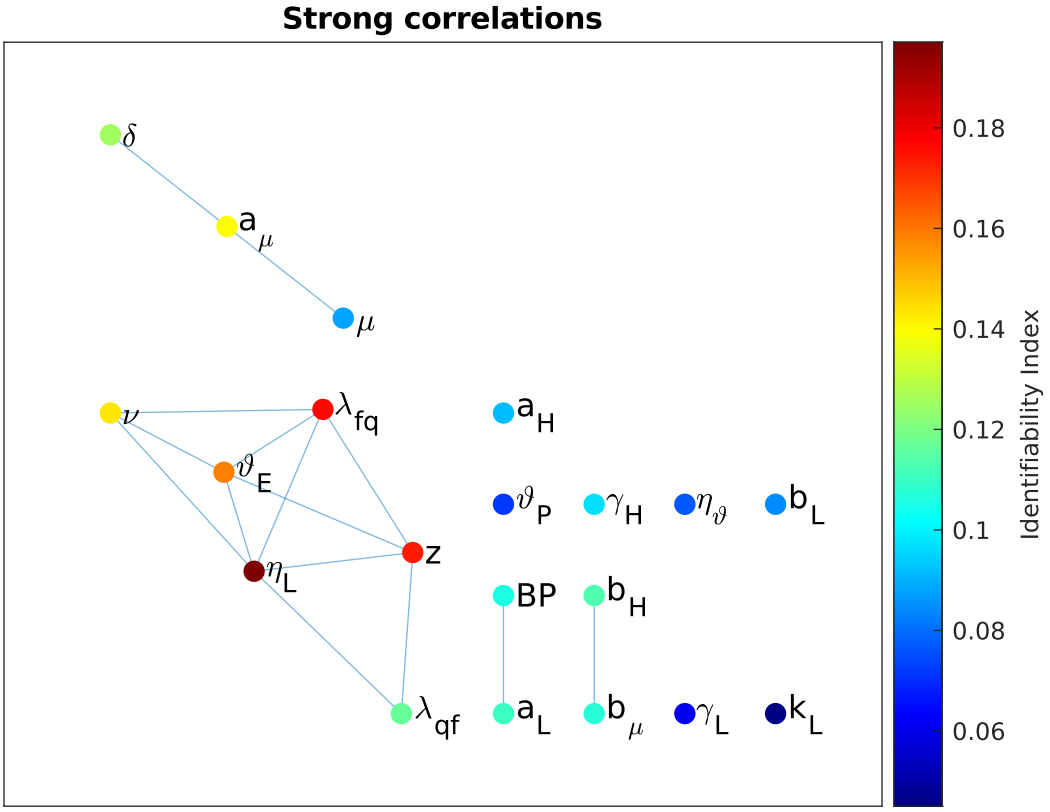
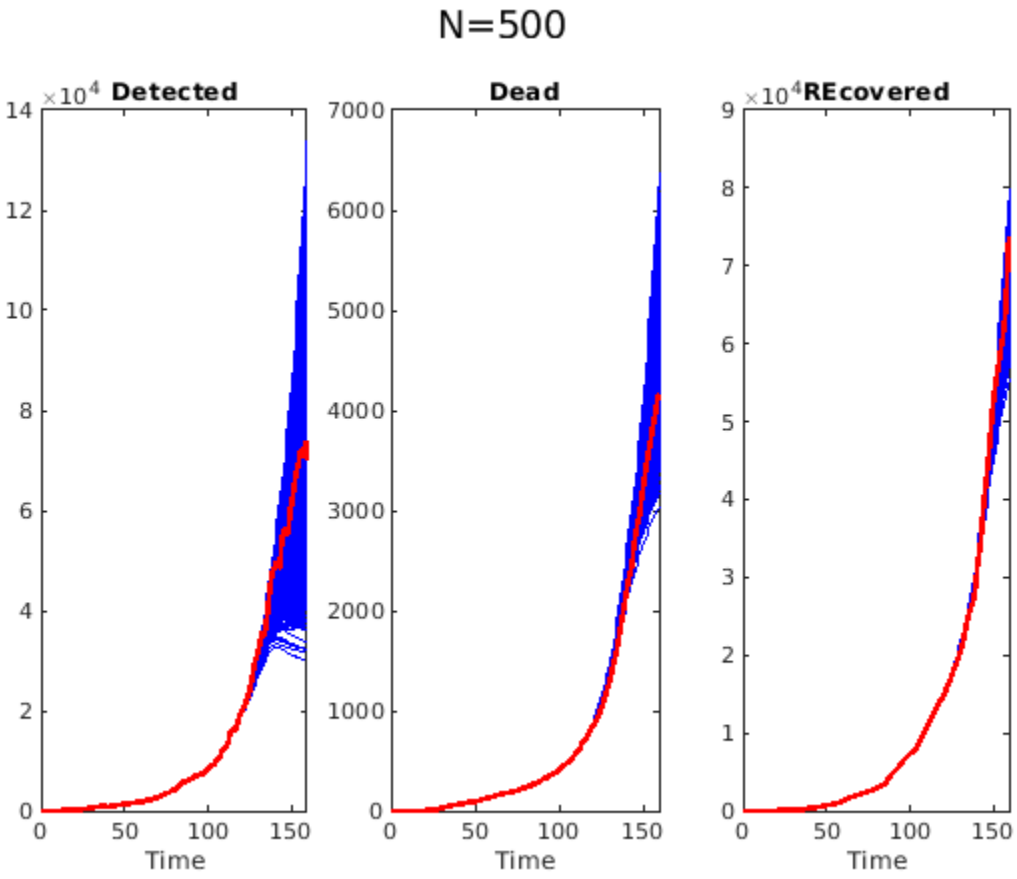
-0.4
-0.6
-0.8
-1


Strong correlations
δ
a μ
μ
ν
λ fq
ϑ E
z
η L
λ qf
a H
ϑ P
γ H
η ϑ
b L
BP
b H
a L
b μ
γ L
k L
0.18
0.16
0.14
0.12
0.1
0.08
0.06
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 data160 to the 190. The status of the validation is: COMPLETED.

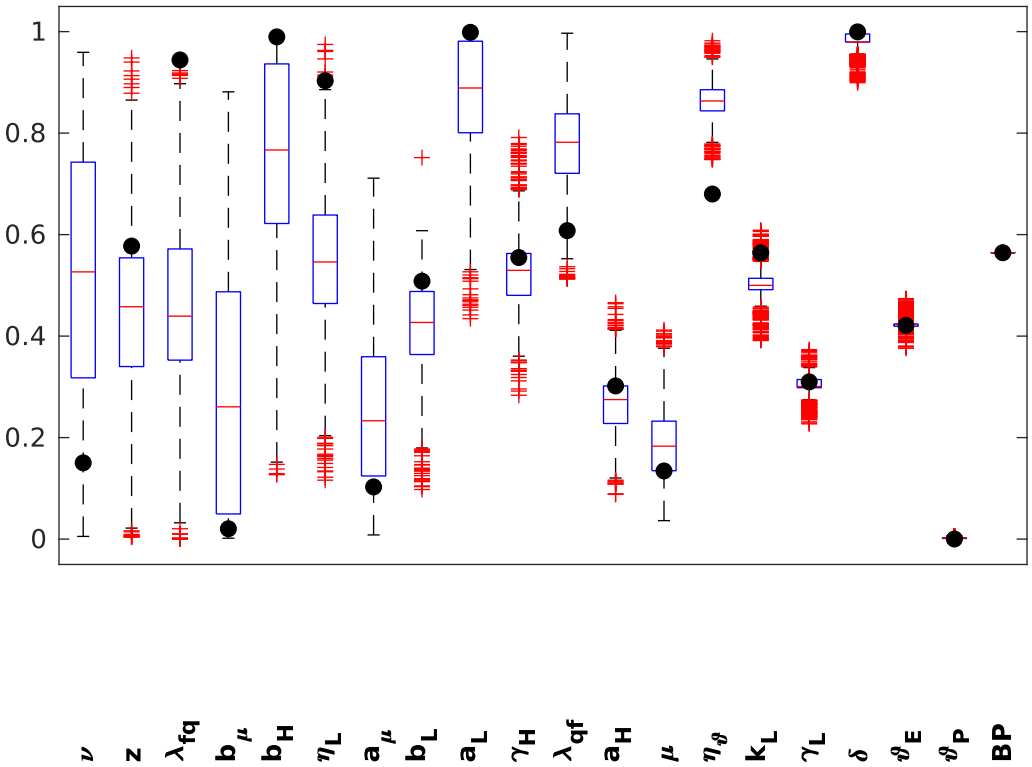
The number of estimations needed to perform the validation was1000.

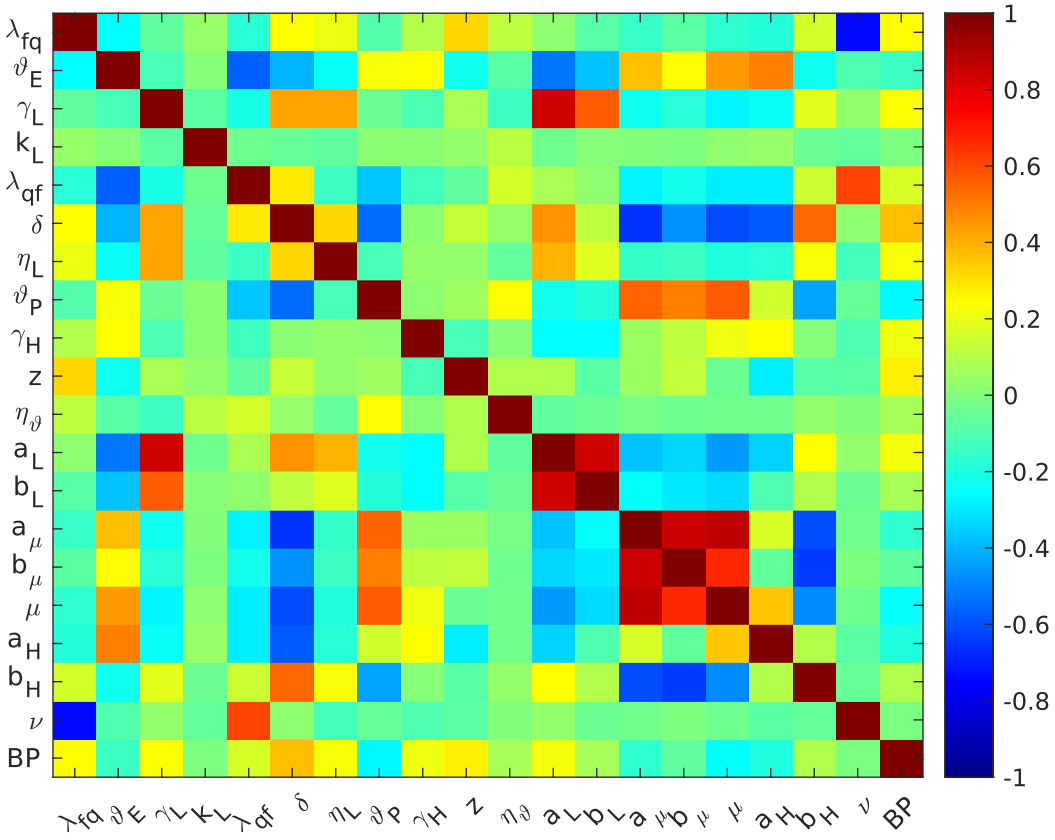
4.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4208'	'0.4583'	'0.4396'	'0.9442'	'0.0994'
\vartheta_E	'0.4158'	'0.4316'	'0.4237'	'0.4211'	'0.124'
\gamma_L	'0.2934'	'0.3082'	'0.3008'	'0.3098'	'0.113'
k_L	'5.4135'	'5.5865'	'5.5'	'6.0775'	'0.0433'
\lambda_{qf}	'0.7698'	'0.7941'	'0.782'	'0.6078'	'0.115'
\delta	'0.1438'	'0.15'	'0.1469'	'0.1499'	'0.1867'
\eta_L	'0.529'	'0.5629'	'0.546'	'0.9032'	'0.0853'
\vartheta_P	'0.0016'	'0.002'	'0.0018'	'0.0002'	'0.121'
\gamma_H	'0.5175'	'0.5416'	'0.5296'	'0.5548'	'0.0654'
z	'13.2401'	'14.2353'	'13.7377'	'17.3232'	'0.07'
\eta_\vartheta	'0.8559'	'0.8709'	'0.8634'	'0.68'	'0.0501'
a_L	'13.0682'	'13.8177'	'13.443'	'14.9805'	'0.162'
b_L	'6.7507'	'7.2032'	'6.9769'	'8.1152'	'0.1154'
a_\mu	'4.0805'	'4.4607'	'4.2706'	'2.4399'	'0.1734'
b_\mu	'4.3505'	'4.9477'	'4.6491'	'1.2848'	'0.1466'
\mu	'0.1733'	'0.1935'	'0.1834'	'0.1343'	'0.1633'
a_H	'4.7106'	'4.9878'	'4.8492'	'5.2251'	'0.0985'
b_H	'11.4876'	'11.9799'	'11.7338'	'14.8547'	'0.1349'
\nu	'251.7861'	'274.7827'	'263.2844'	'75.1524'	'0.1004'
BP	'159.3958'	'159.6042'	'159.5'	'159.5'	'0.0676'

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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0.2
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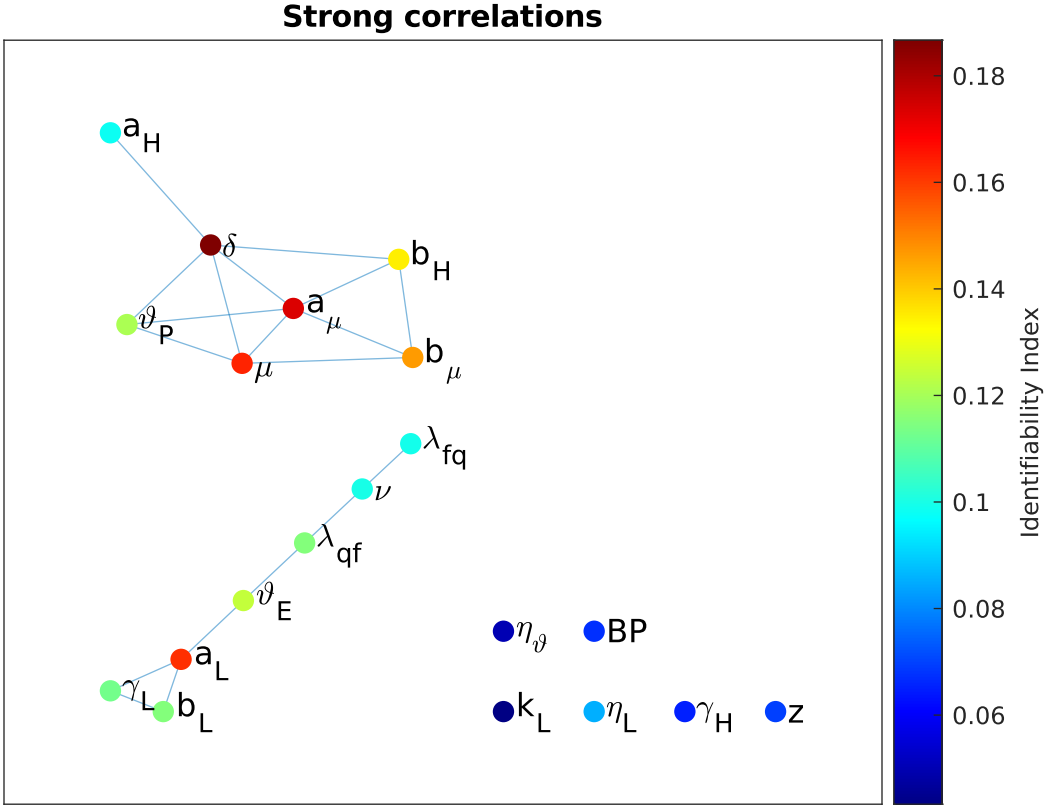
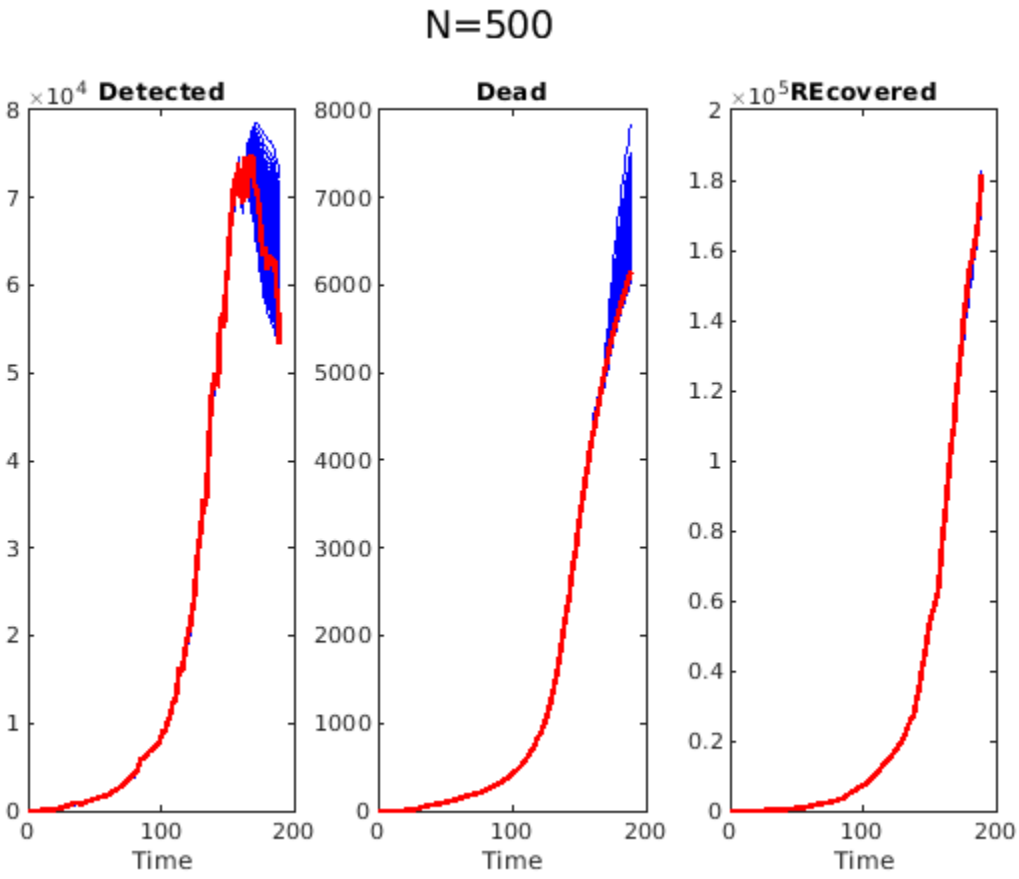
-0.4
-0.6
-0.8
-1


Strong correlations
a H
δ
b H
a μ
ϑ P
μ
b μ
λ fq
ν
λ qf
ϑ E
a L
γ L
b L
η ϑ
BP
k L
η L
γ H
z
0.18
0.16
0.14
0.12
0.1
0.08
0.06
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 data190 to the 250. The status of the validation is: COMPLETED.

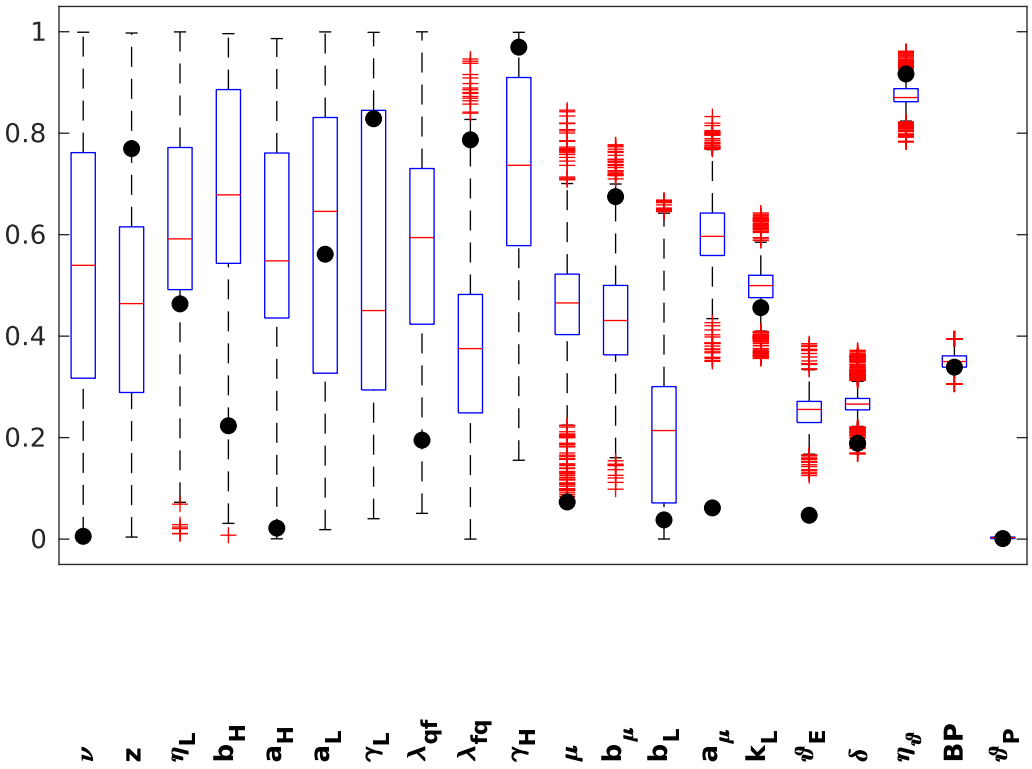
The number of estimations needed to perform the validation was1000.

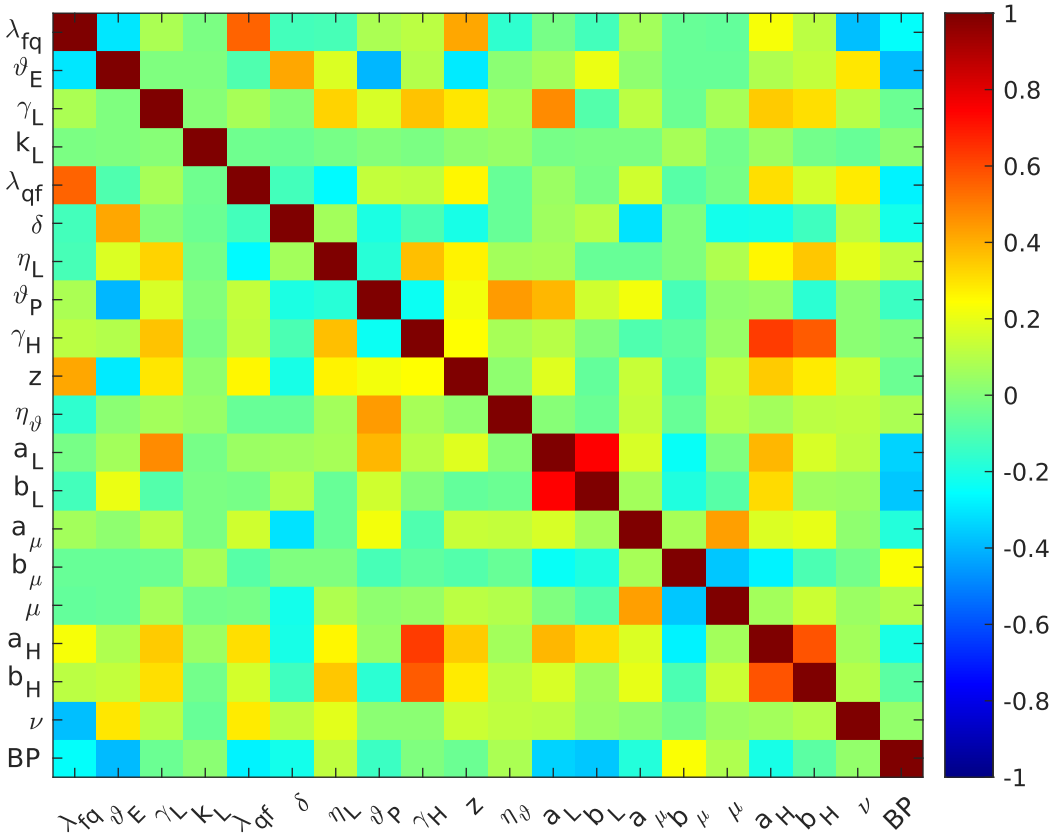
5.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.3534'	'0.3978'	'0.3756'	'0.787'	'0.1003'
\vartheta_E	'0.2456'	'0.2655'	'0.2555'	'0.047'	'0.0738'
\gamma_L	'0.4222'	'0.4787'	'0.4505'	'0.8285'	'0.0908'
k_L	'5.4162'	'5.5767'	'5.4965'	'5.1052'	'0.0401'
\lambda_{qf}	'0.5738'	'0.6148'	'0.5943'	'0.195'	'0.0964'
\delta	'0.0381'	'0.0417'	'0.0399'	'0.0283'	'0.0708'
\eta_L	'0.5706'	'0.6126'	'0.5916'	'0.4636'	'0.0841'
\vartheta_P	'0.0026'	'0.003'	'0.0028'	'0.001'	'0.0668'
\gamma_H	'0.7171'	'0.7564'	'0.7367'	'0.9696'	'0.1104'
z	'13.145'	'14.7036'	'13.9243'	'23.0902'	'0.0969'
\eta_\vartheta	'0.8597'	'0.8808'	'0.8703'	'0.9168'	'0.0571'
a_L	'9.6509'	'10.4341'	'10.0425'	'8.8606'	'0.1106'
b_L	'3.7358'	'4.257'	'3.9964'	'1.5303'	'0.0905'
a_\mu	'9.1353'	'9.5728'	'9.3541'	'1.8612'	'0.0737'
b_\mu	'6.826'	'7.2372'	'7.0316'	'10.4486'	'0.0666'
\mu	'0.4477'	'0.4833'	'0.4655'	'0.0732'	'0.0683'
a_H	'8.3647'	'8.9916'	'8.6782'	'1.303'	'0.1306'
b_H	'10.2102'	'10.7867'	'10.4984'	'4.1277'	'0.118'
\nu	'257.1154'	'282.5412'	'269.8283'	'2.7704'	'0.0779'
BP	'191.3048'	'191.6952'	'191.5'	'190.5'	'0.066'

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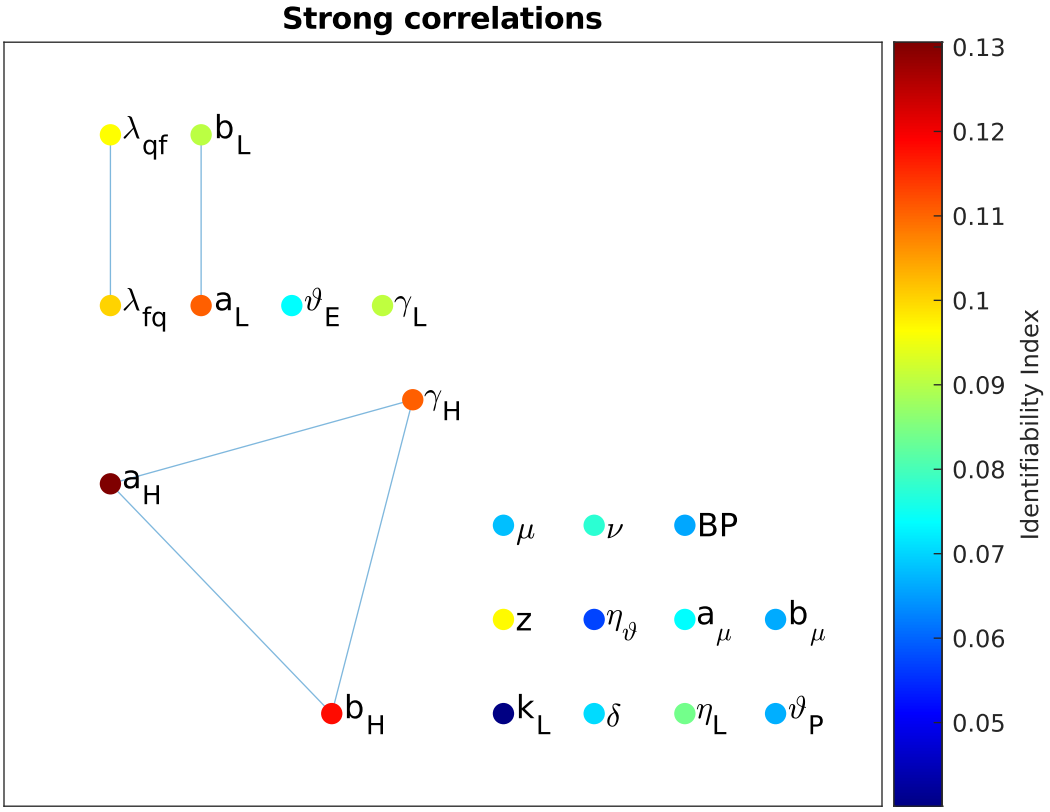
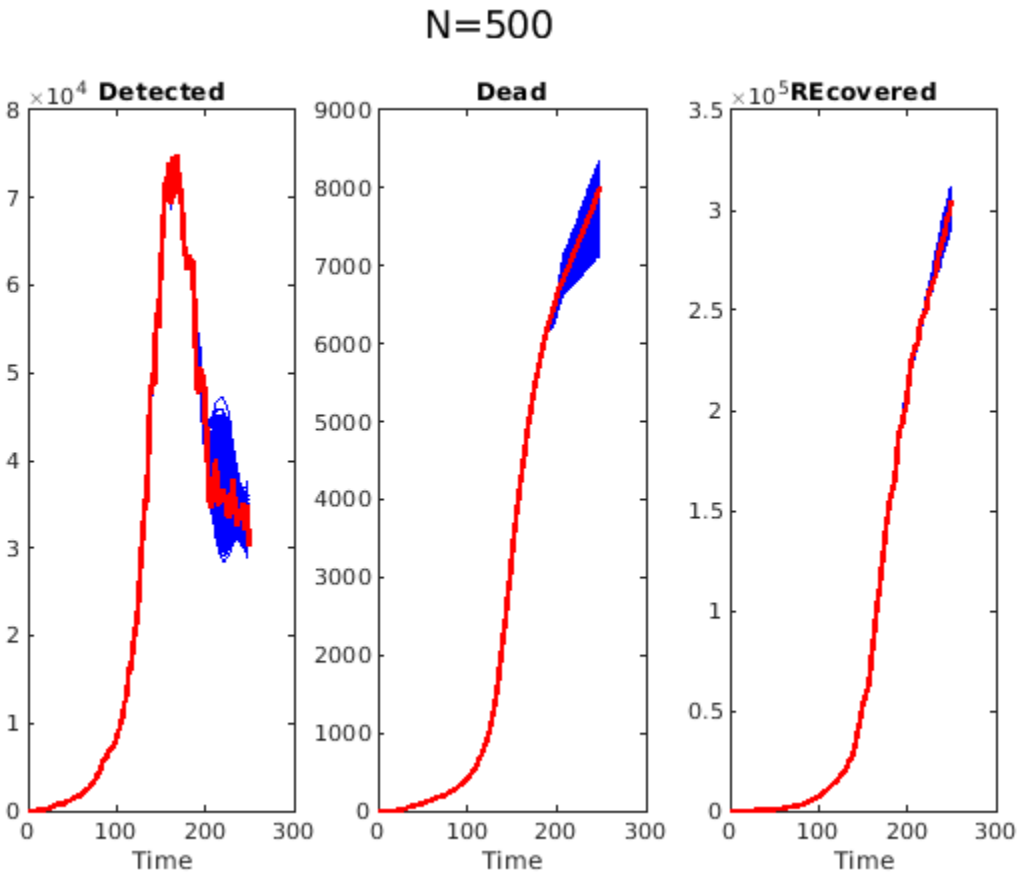
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
λ_{qf}
b_L
λ_{fq}
a_L
ϑ_E
γ_L
γ_H
a_H
b_H
μ
ν
BP
z
η_ϑ
a_μ
b_μ
k_L
δ
η_L
ϑ_P
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
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 data250 to the 281. The status of the validation is: COMPLETED.

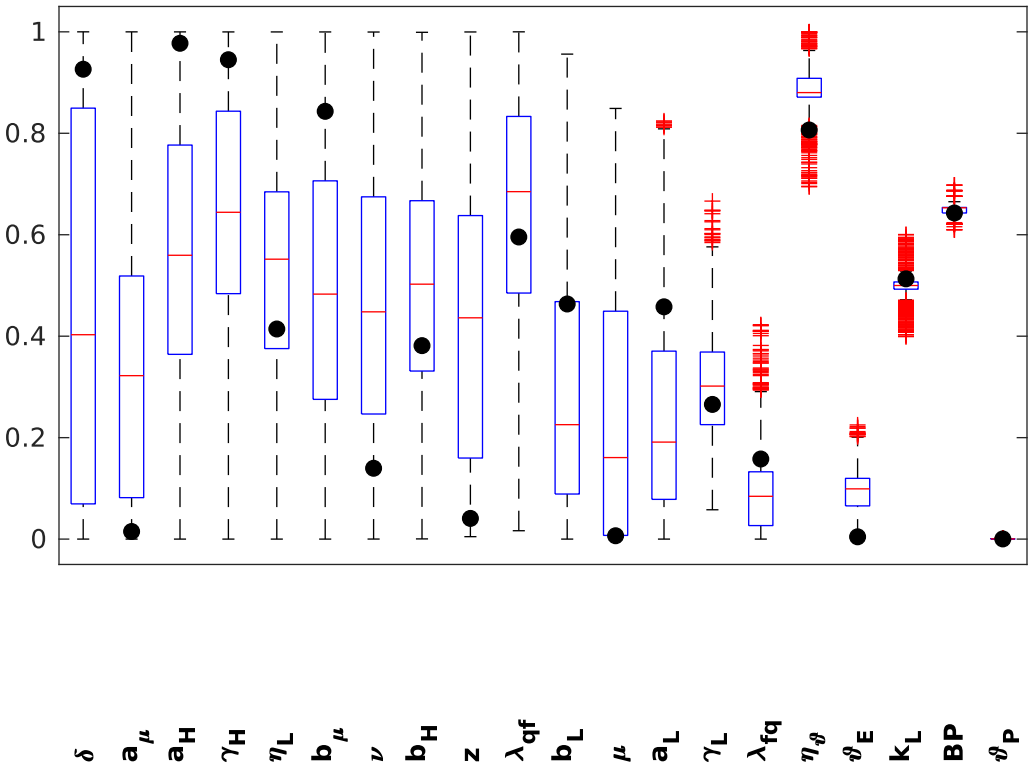
The number of estimations needed to perform the validation was1000.

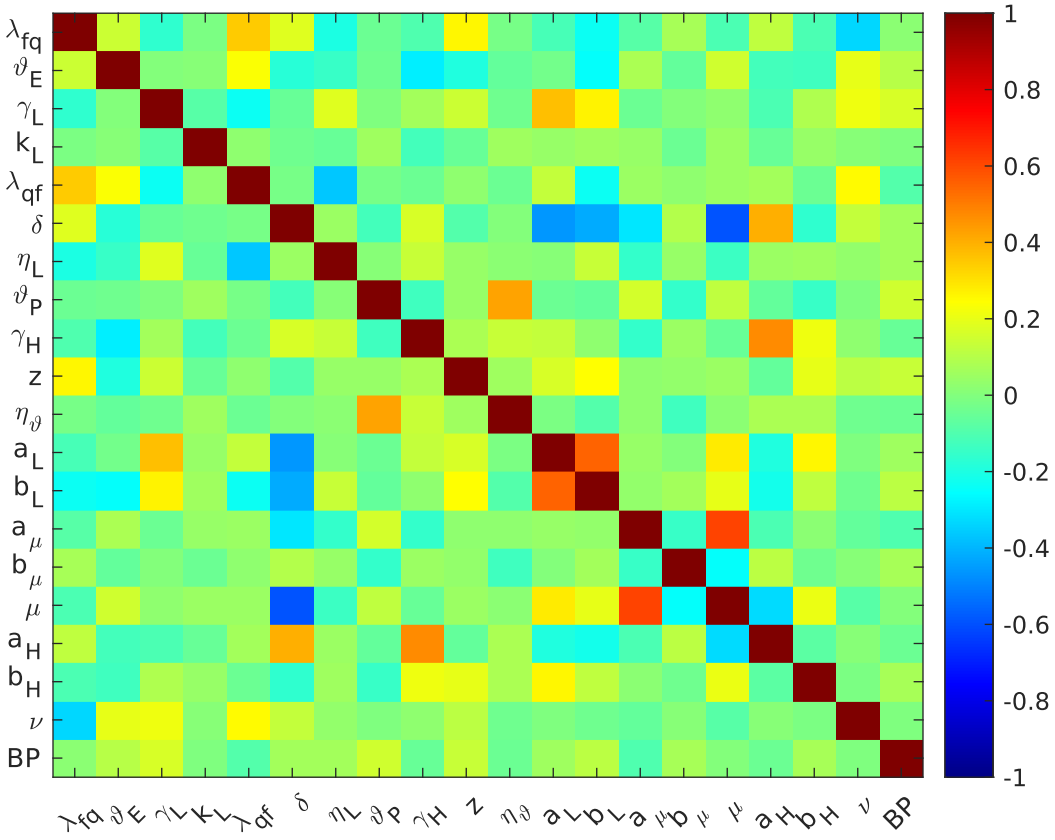
6.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0567'	'0.112'	'0.0844'	'0.1579'	'0.0858'
\vartheta_E	'0.0938'	'0.1043'	'0.099'	'0.0045'	'0.0605'
\gamma_L	'0.2844'	'0.3189'	'0.3016'	'0.2655'	'0.0703'
k_L	'5.3802'	'5.6185'	'5.4994'	'5.6175'	'0.0489'
\lambda_{qf}	'0.6616'	'0.7083'	'0.6849'	'0.5955'	'0.0769'
\delta	'0.055'	'0.0658'	'0.0604'	'0.1389'	'0.1175'
\eta_L	'0.5281'	'0.5755'	'0.5518'	'0.4142'	'0.0725'
\vartheta_P	'0.0003'	'0.0004'	'0.0004'	'0.0003'	'0.0474'
\gamma_H	'0.6174'	'0.6711'	'0.6443'	'0.945'	'0.0824'
z	'12.2666'	'13.9074'	'13.087'	'1.2237'	'0.0778'
\eta_\vartheta	'0.8627'	'0.8977'	'0.8802'	'0.8065'	'0.0594'
a_L	'3.3165'	'4.0379'	'3.6772'	'7.411'	'0.0995'
b_L	'3.7842'	'4.5324'	'4.1583'	'7.4886'	'0.1061'
a_\mu	'5.1752'	'5.8464'	'5.5108'	'1.2094'	'0.0895'
b_\mu	'7.3919'	'8.1305'	'7.7612'	'12.8059'	'0.0691'
\mu	'0.1359'	'0.1855'	'0.1607'	'0.0066'	'0.1161'
a_H	'8.4621'	'9.2043'	'8.8332'	'14.6838'	'0.0848'
b_H	'7.6939'	'8.3774'	'8.0356'	'6.3394'	'0.0751'
\nu	'211.2113'	'236.8037'	'224.0075'	'69.8181'	'0.0702'
BP	'249.0193'	'249.8503'	'249.4348'	'248.5'	'0.0464'

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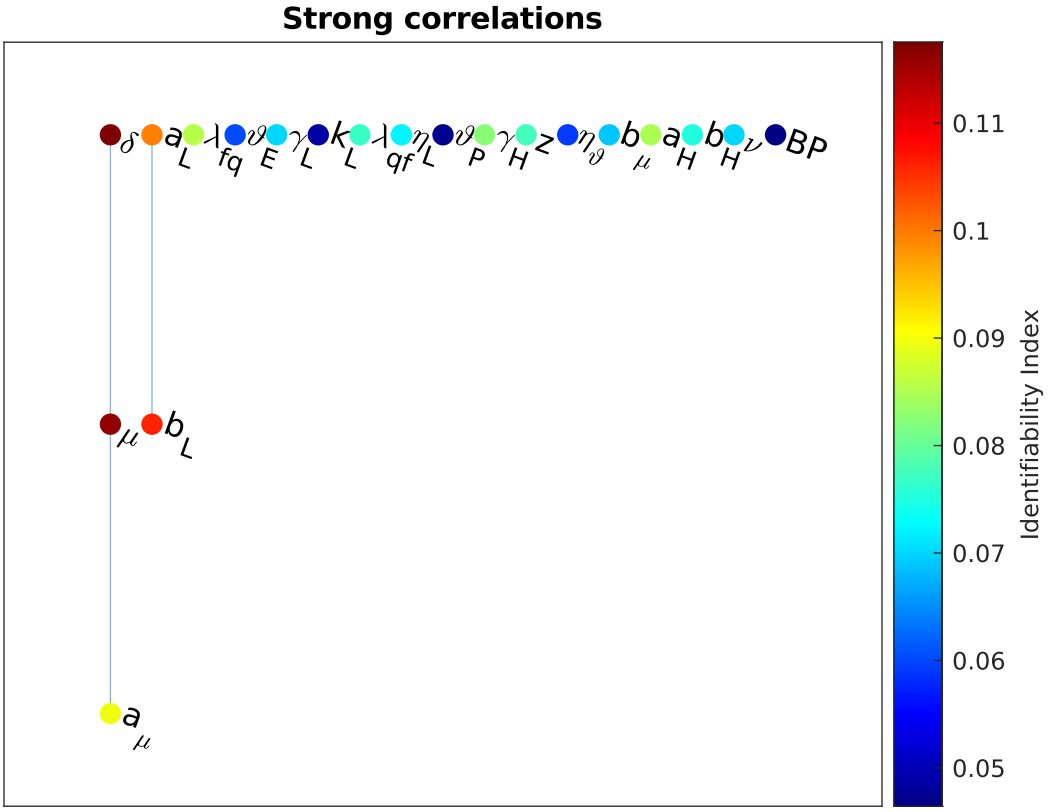
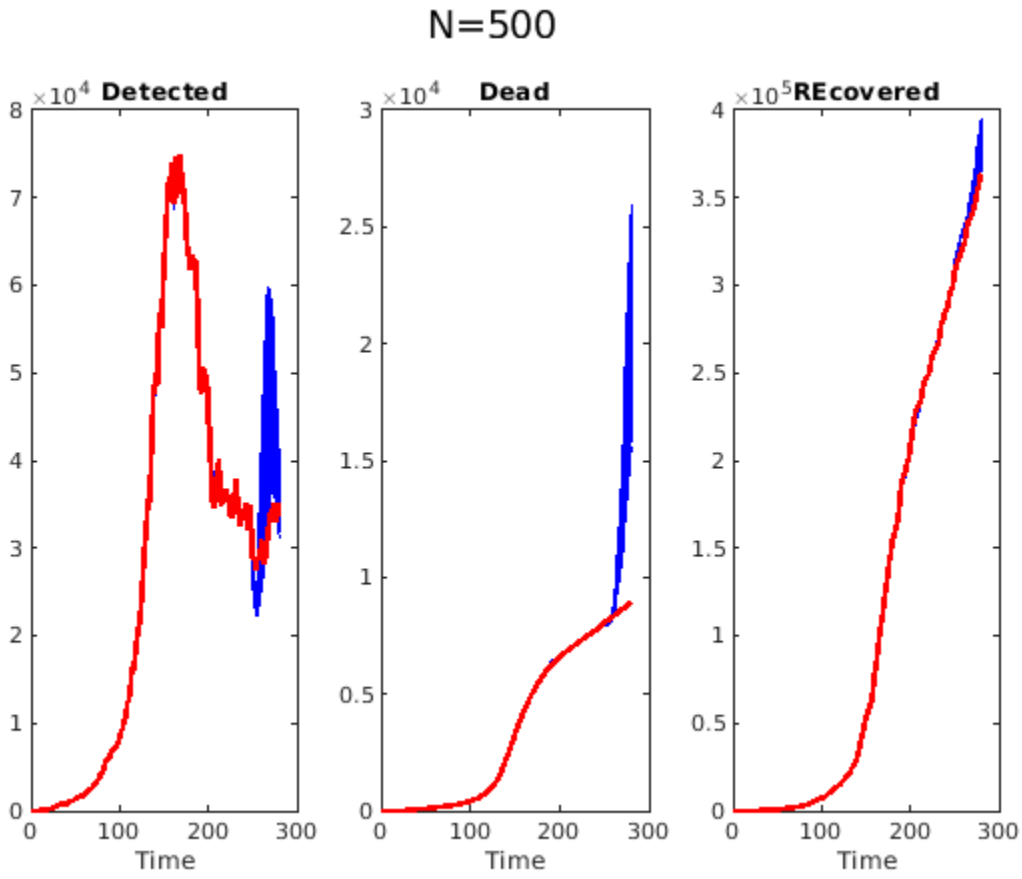
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
Identifiability Index
0.11
0.1
0.09
0.08
0.07
0.06
0.05

6.4. Uncertainty analisys



Chapter 7. Extension number7

7.1. Basic information

The extension to be validated consists of the time series from the data281 to the 314. The status of the validation is: COMPLETED.

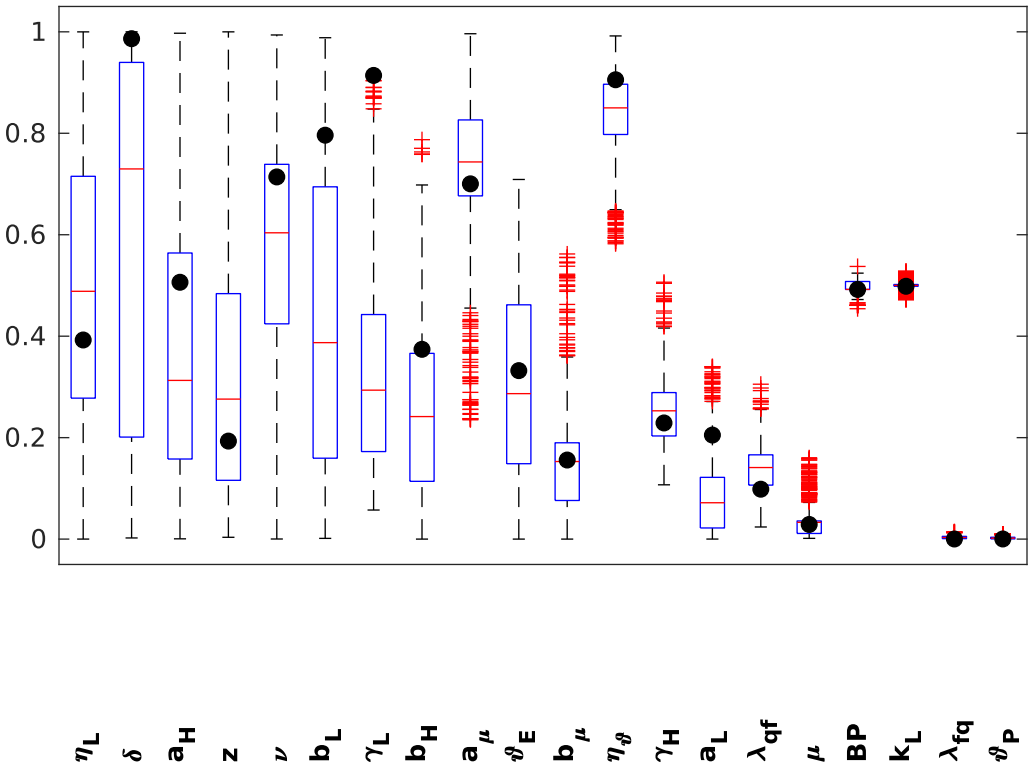
The number of estimations needed to perform the validation was1000.

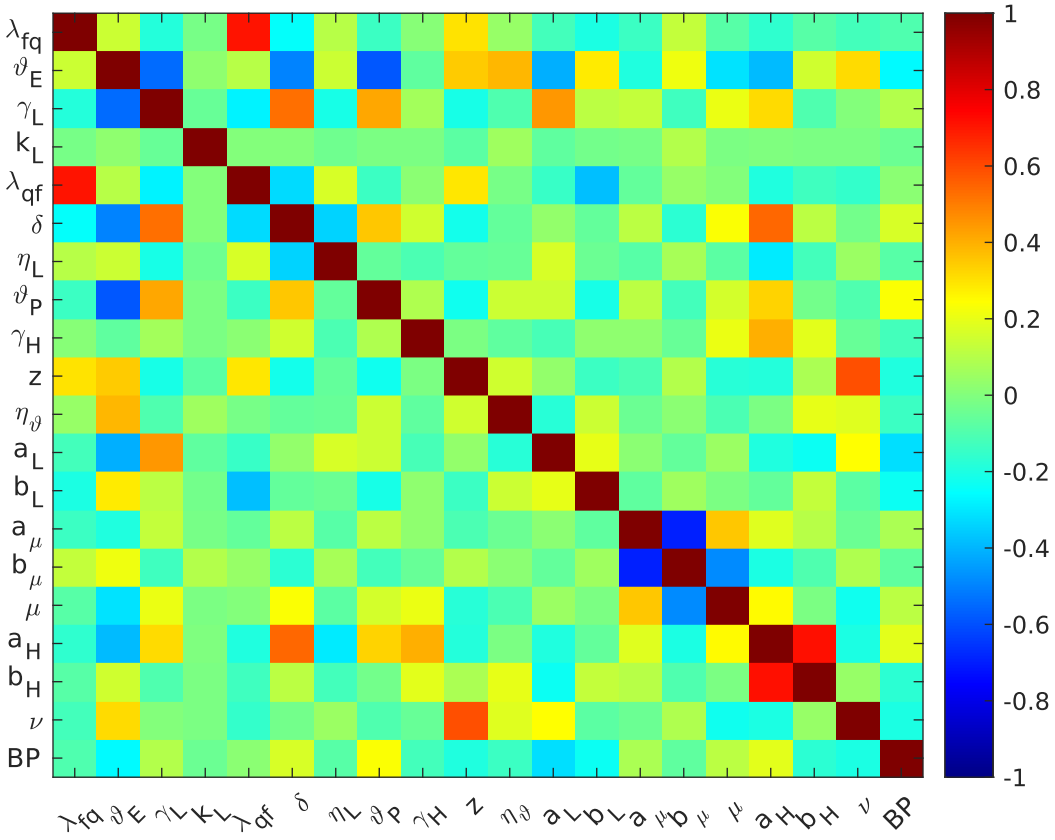
7.2. Estimated parameters with their intervals

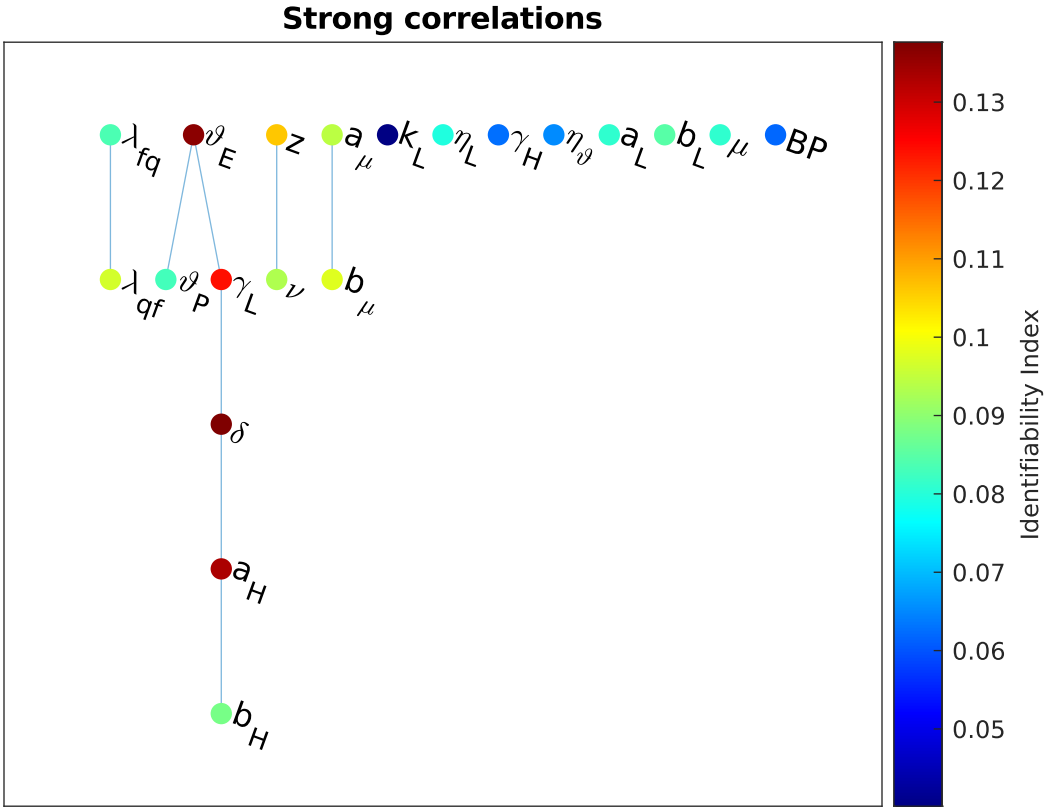
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0164'	'0.0031'	'0.0002'	'0.0836'
\vartheta_E	'0.2676'	'0.3059'	'0.2868'	'0.3321'	'0.1363'
\gamma_L	'0.2714'	'0.3161'	'0.2938'	'0.9141'	'0.1238'
k_L	'5.4315'	'5.5703'	'5.5009'	'5.4857'	'0.0401'
\lambda_{qf}	'0.1217'	'0.1606'	'0.1411'	'0.0984'	'0.0965'
\delta	'0.1041'	'0.1148'	'0.1095'	'0.148'	'0.1376'
\eta_L	'0.4621'	'0.5149'	'0.4885'	'0.3925'	'0.0796'
\vartheta_P	'0.0013'	'0.0025'	'0.0019'	'0.0003'	'0.0831'
\gamma_H	'0.2377'	'0.2685'	'0.2531'	'0.229'	'0.0628'
z	'7.5216'	'9.0371'	'8.2794'	'5.7965'	'0.1063'
\eta_\vartheta	'0.8358'	'0.8639'	'0.8498'	'0.9055'	'0.0654'
a_L	'1.7773'	'2.2334'	'2.0053'	'3.8714'	'0.081'
b_L	'6.0113'	'6.8324'	'6.4219'	'12.147'	'0.0848'
a_\mu	'11.0627'	'11.7529'	'11.4078'	'10.8046'	'0.0943'
b_\mu	'2.8058'	'3.4811'	'3.1435'	'3.1822'	'0.0979'
\mu	'0.0152'	'0.0511'	'0.0331'	'0.0288'	'0.0812'
a_H	'5.0516'	'5.7078'	'5.3797'	'8.0883'	'0.1334'
b_H	'4.1527'	'4.6219'	'4.3873'	'6.2379'	'0.088'
\nu	'290.9685'	'312.8414'	'301.905'	'356.9738'	'0.0933'
BP	'281.4036'	'281.5964'	'281.5'	'281.5'	'0.062'

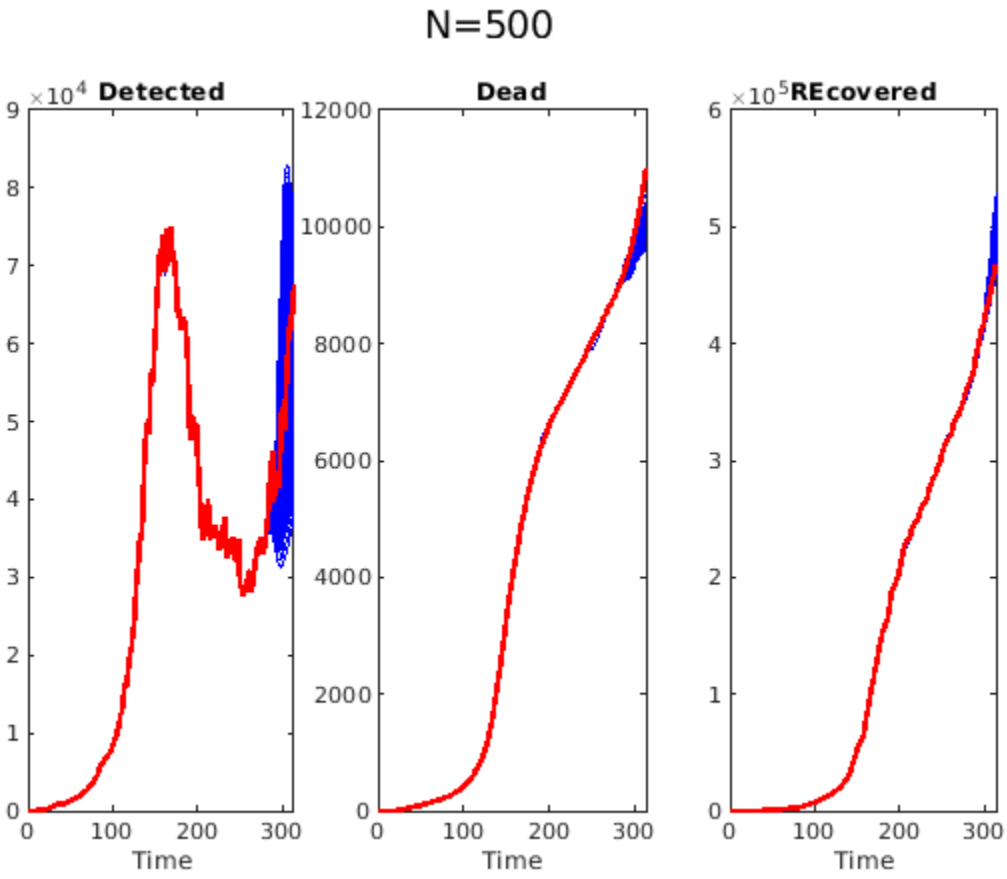
7.3. Identifiability analisys




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}
ϑ_E
z
a_μ
k_L
η_L
γ_H
η_ϑ
a_L
b_L
μ
BP
λ_{qf}
ϑ_P
γ_L
ν
b_μ
δ
a_H
b_H
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
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 data314 to the 331. The status of the validation is: COMPLETED.

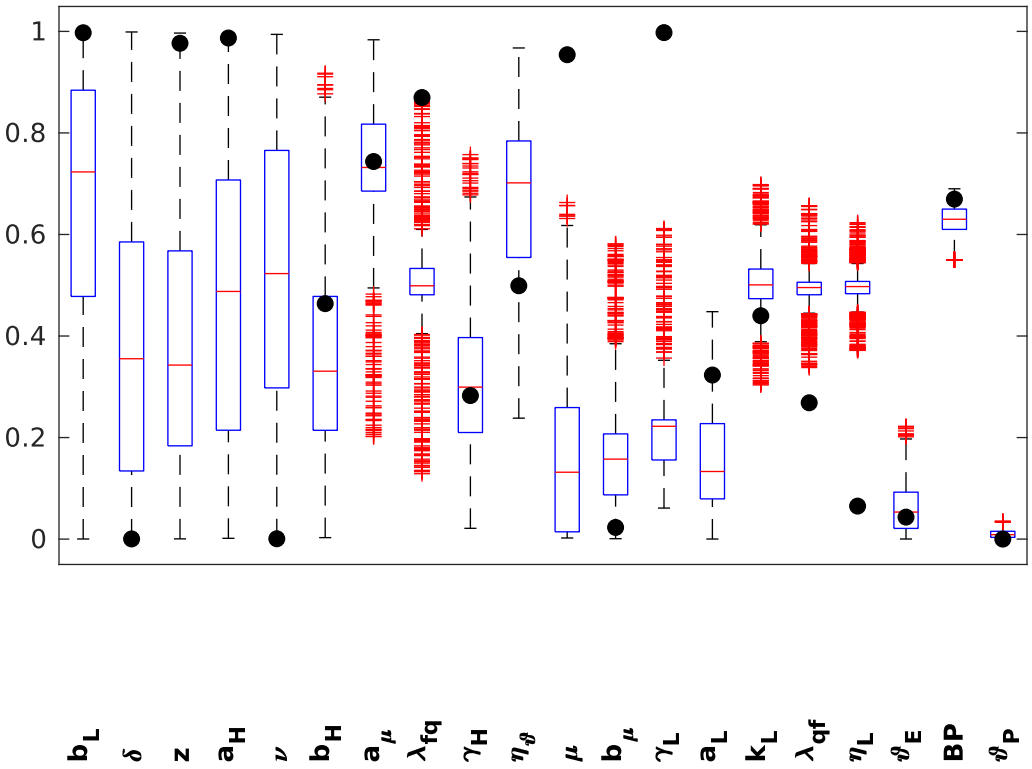
The number of estimations needed to perform the validation was1000.

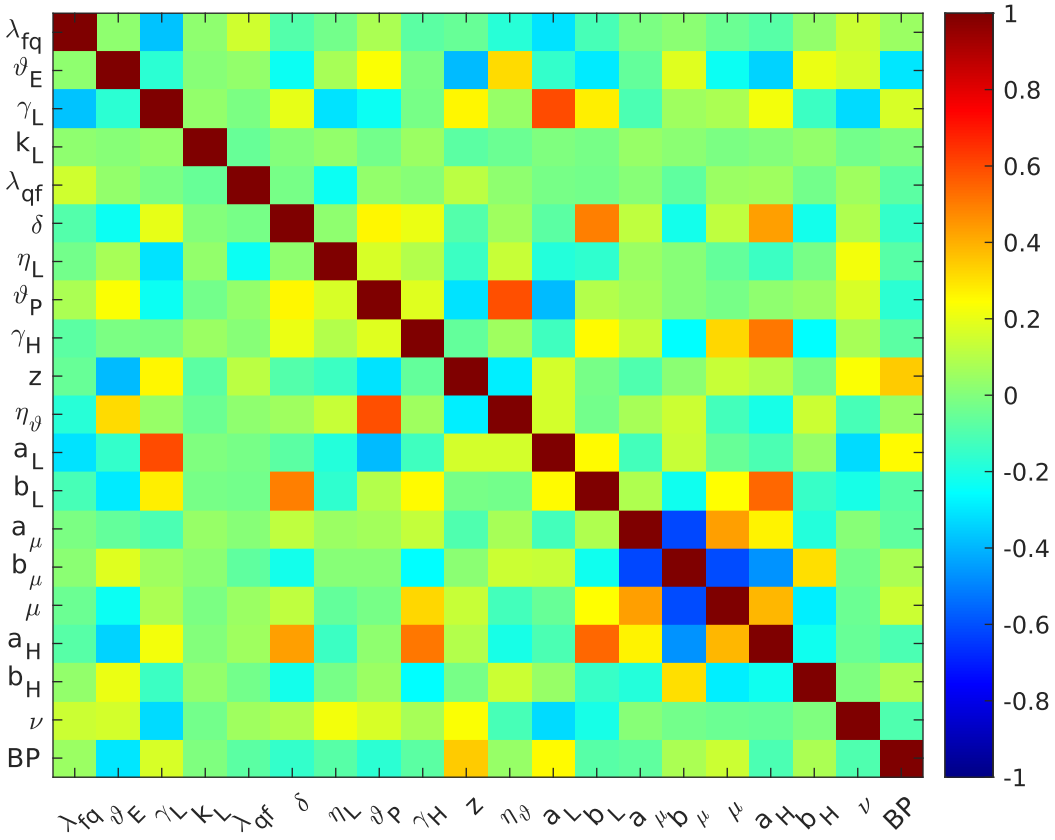
8.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4784'	'0.5195'	'0.499'	'0.8697'	'0.0691'
\vartheta_E	'0.0478'	'0.0587'	'0.0533'	'0.0433'	'0.0732'
\gamma_L	'0.1967'	'0.2477'	'0.2222'	'0.9976'	'0.1083'
k_L	'5.4102'	'5.603'	'5.5066'	'4.959'	'0.0422'
\lambda_{qf}	'0.481'	'0.51'	'0.4955'	'0.2685'	'0.0531'
\delta	'0.0495'	'0.057'	'0.0533'	'0'	'0.0887'
\eta_L	'0.4862'	'0.5086'	'0.4974'	'0.065'	'0.0632'
\vartheta_P	'0.0079'	'0.0095'	'0.0087'	'0'	'0.0773'
\gamma_H	'0.2829'	'0.3158'	'0.2993'	'0.2827'	'0.0885'
z	'9.5923'	'10.9732'	'10.2827'	'29.2989'	'0.0842'
\eta_\vartheta	'0.6875'	'0.7159'	'0.7017'	'0.499'	'0.0864'
a_L	'2.7127'	'3.0156'	'2.8642'	'5.5245'	'0.0916'
b_L	'10.7598'	'11.4903'	'11.125'	'14.9627'	'0.1084'
a_\mu	'10.9133'	'11.582'	'11.2476'	'11.4119'	'0.0933'
b_\mu	'2.891'	'3.5198'	'3.2054'	'1.3215'	'0.1157'
\mu	'0.1143'	'0.1492'	'0.1317'	'0.9541'	'0.0972'
a_H	'7.4934'	'8.1649'	'7.8292'	'14.818'	'0.1275'
b_H	'5.3546'	'5.9066'	'5.6306'	'7.4926'	'0.0747'
\nu	'249.7964'	'273.1778'	'261.4871'	'0.3391'	'0.0783'
BP	'312.3253'	'312.6747'	'312.5'	'314.482'	'0.0583'

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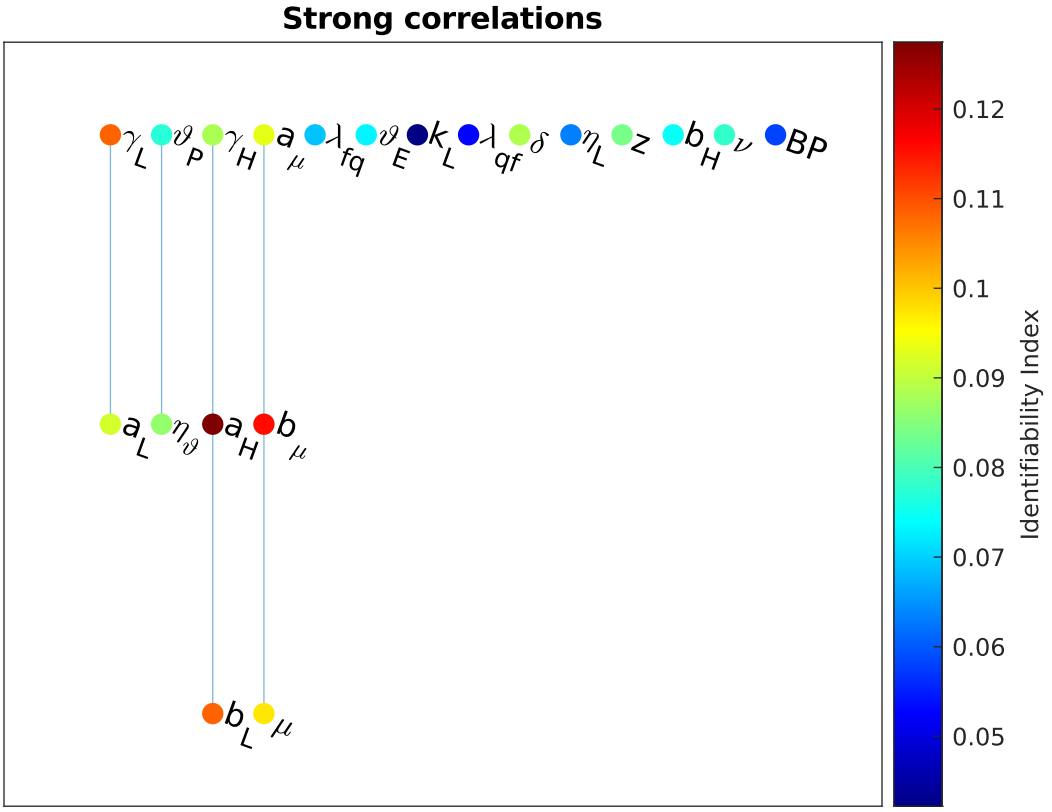
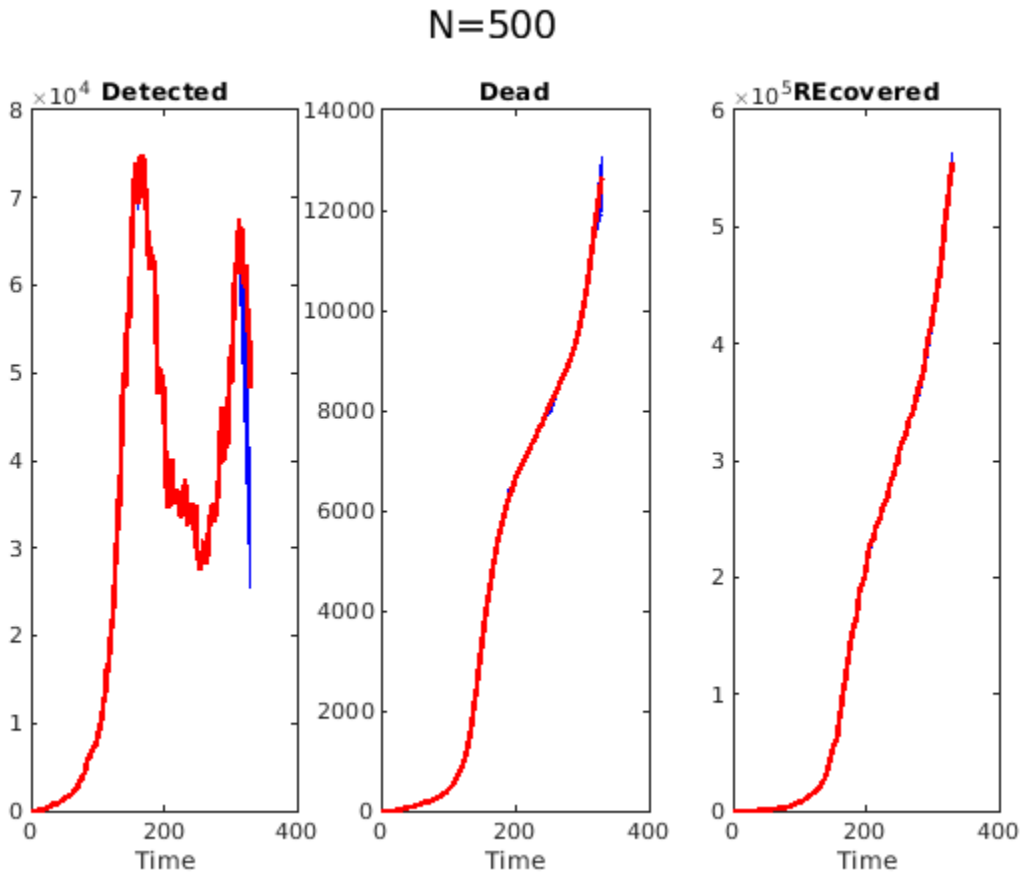
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
γ_L ϑ_P γ_H a_μ λ_{fq} ϑ_E k_L λ_{qf} δ η_L z b_H ν BP
a_L η_ϑ a_H b_μ
b_L μ
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
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 data331 to the 393. The status of the validation is: COMPLETED.

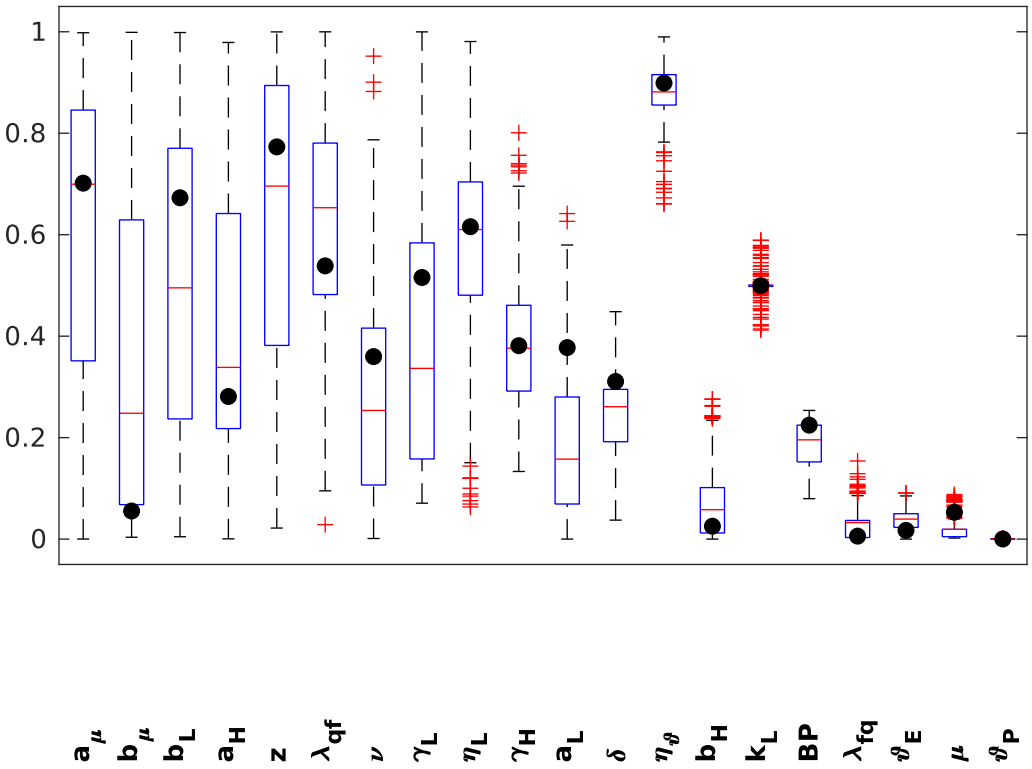
The number of estimations needed to perform the validation was1000.

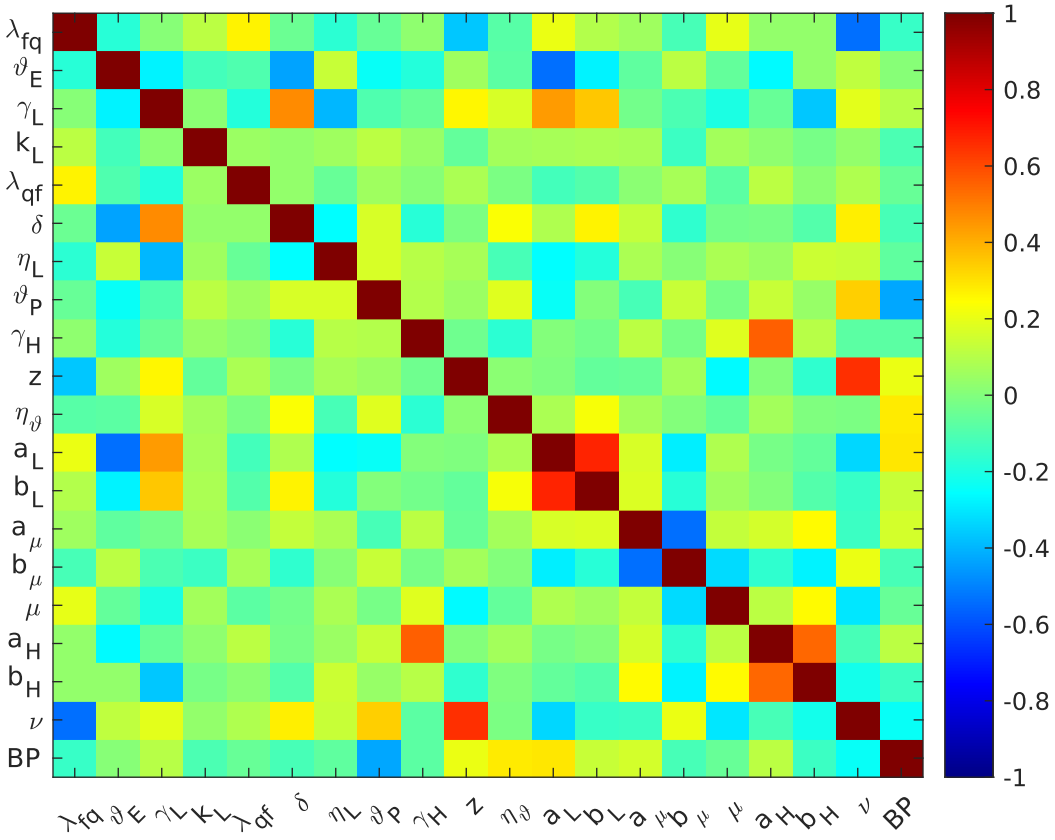
9.2. Estimated parameters with their intervals

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

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0779'	'0.0331'	'0.0059'	'0.1106'
\vartheta_E	'0.0351'	'0.0439'	'0.0395'	'0.0172'	'0.083'
\gamma_L	'0.279'	'0.394'	'0.3365'	'0.5157'	'0.1297'
k_L	'5.2469'	'5.7517'	'5.4993'	'5.4955'	'0.0693'
\lambda_{qf}	'0.6034'	'0.703'	'0.6532'	'0.5385'	'0.0936'
\delta	'0.0355'	'0.0426'	'0.0391'	'0.0466'	'0.0865'
\eta_L	'0.5565'	'0.6589'	'0.6077'	'0.6157'	'0.1081'
\vartheta_P	'0'	'0.0004'	'0.0002'	'0.0002'	'0.0586'
\gamma_H	'0.3356'	'0.4187'	'0.3772'	'0.3812'	'0.1048'
z	'18.9693'	'22.78'	'20.8747'	'23.194'	'0.1318'
\eta_\vartheta	'0.8501'	'0.9126'	'0.8814'	'0.8989'	'0.0805'
a_L	'2.6596'	'3.7581'	'3.2089'	'6.2852'	'0.1389'
b_L	'7.0518'	'8.8153'	'7.9335'	'10.4188'	'0.1397'
a_\mu	'9.8971'	'11.6909'	'10.794'	'10.8216'	'0.1331'
b_\mu	'3.5849'	'5.3589'	'4.4719'	'1.7754'	'0.1386'
\mu	'0'	'0.0627'	'0.0192'	'0.053'	'0.0882'
a_H	'4.9686'	'6.5083'	'5.7385'	'4.9349'	'0.1371'
b_H	'1.3723'	'2.2526'	'1.8124'	'1.3558'	'0.1045'
\nu	'104.3886'	'149.202'	'126.7953'	'179.8504'	'0.1468'
BP	'326.7483'	'328.2513'	'327.4998'	'329.4977'	'0.0714'

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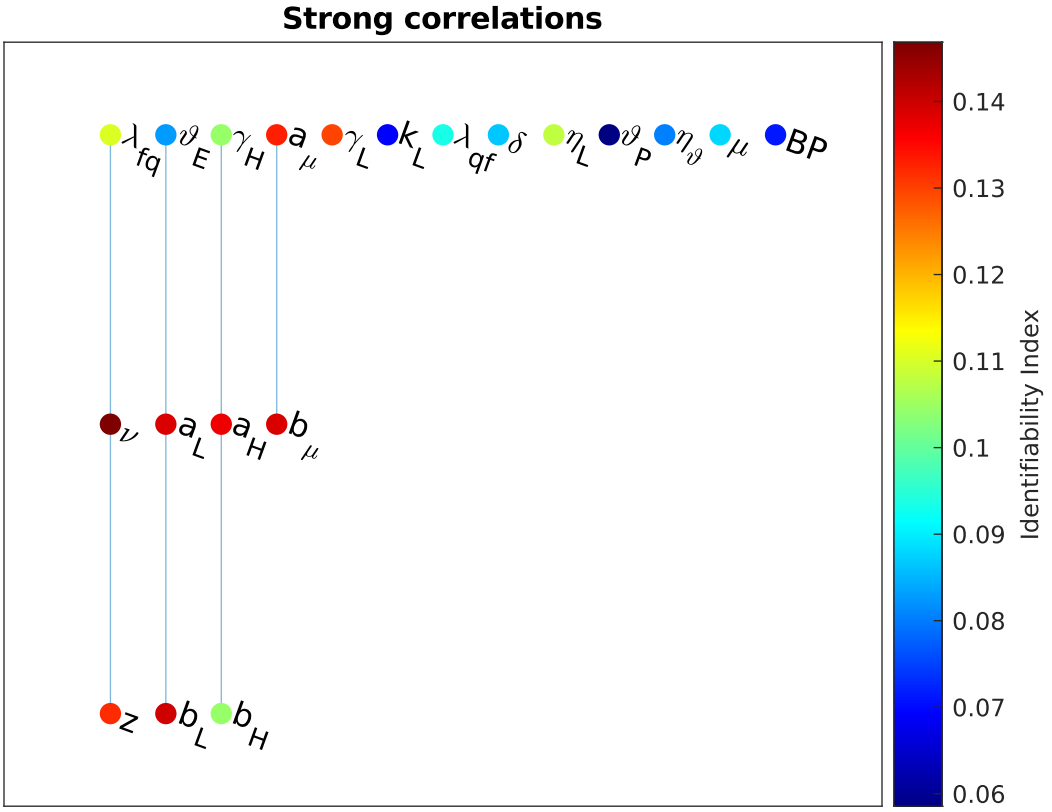
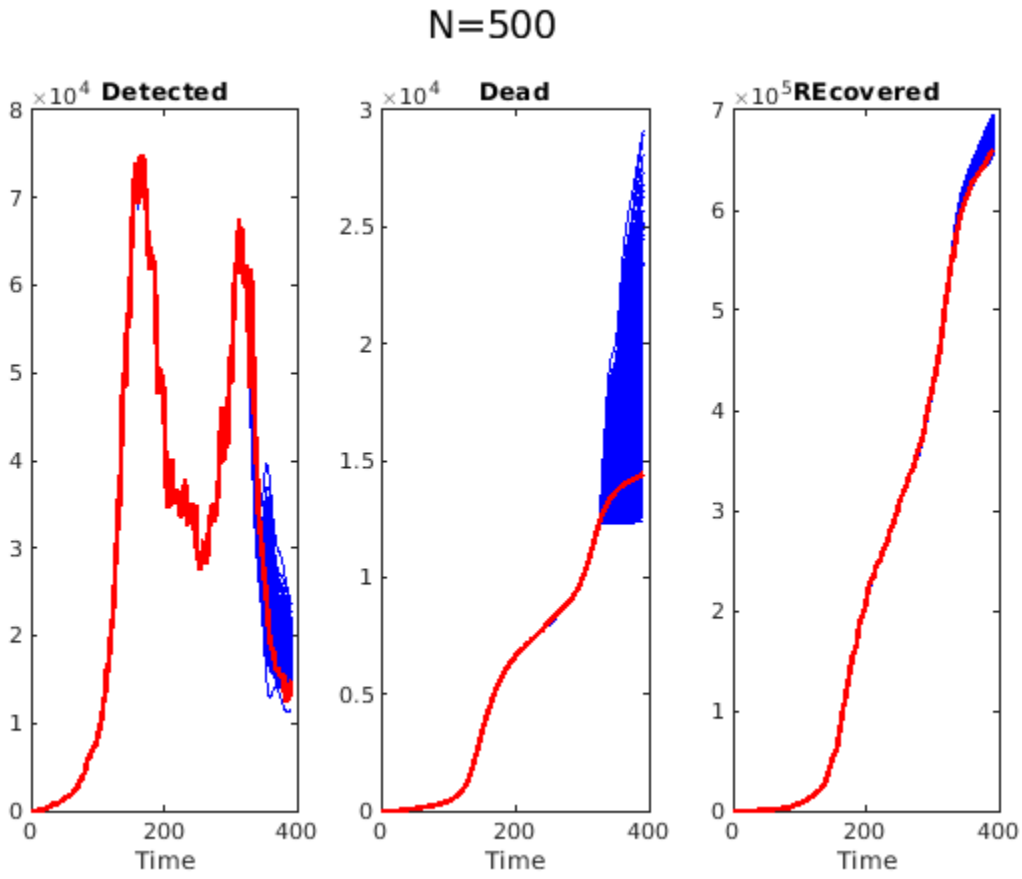
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
λ_{fq} ϑ_E γ_H a_μ γ_L k_L λ_{qf} δ η_L ϑ_P η_ϑ μ BP
ν a_L a_H b_μ
z b_L b_H
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 data393 to the 444. The status of the validation is: COMPLETED.

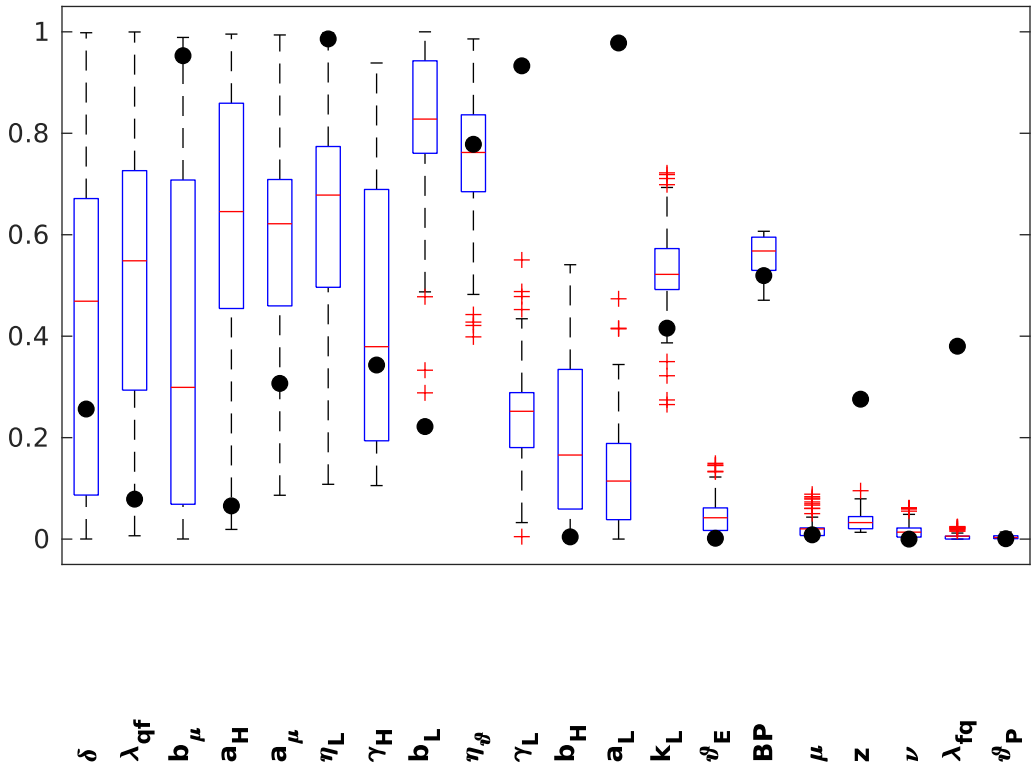
The number of estimations needed to perform the validation was1000.

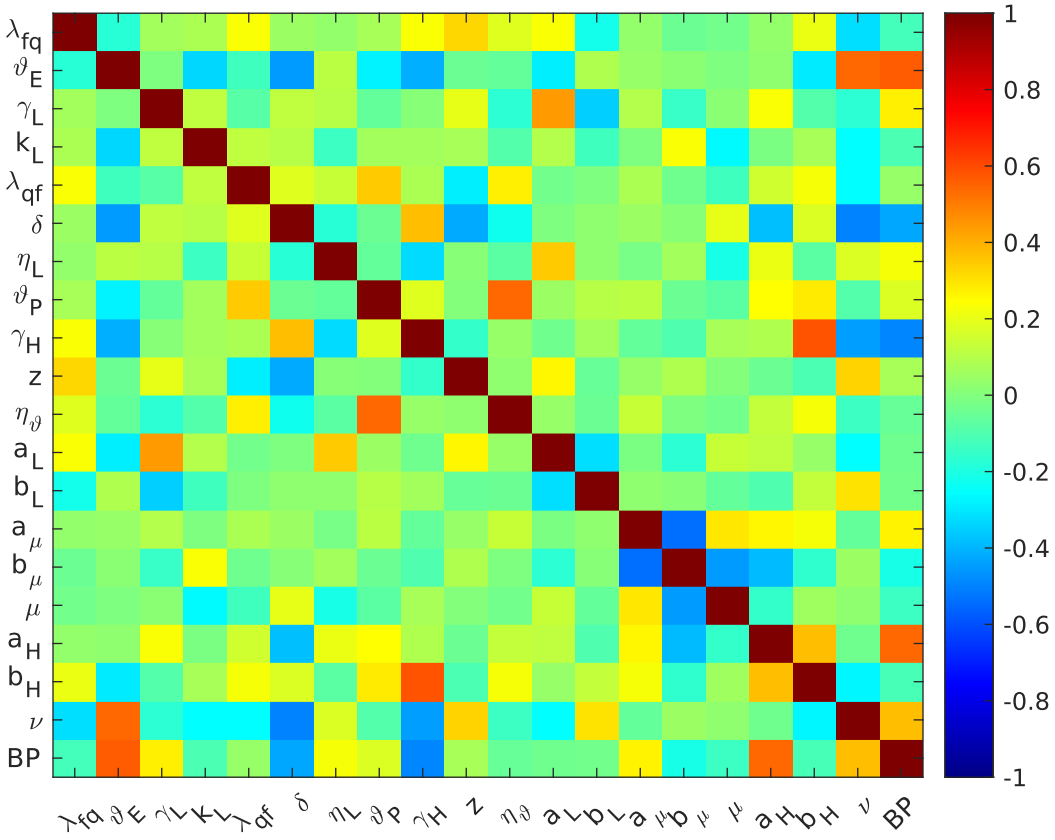
10.2. Estimated parameters with their intervals

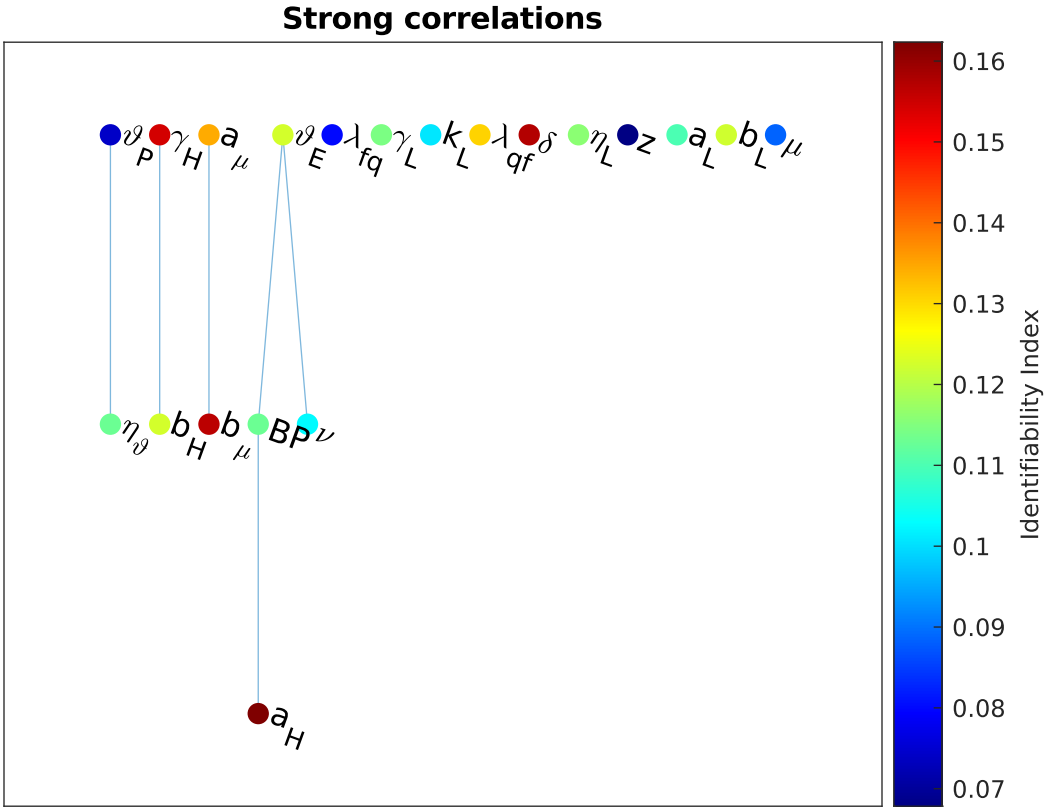
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0426'	'0.0058'	'0.3802'	'0.0803'
\vartheta_E	'0.0178'	'0.0663'	'0.0421'	'0.0017'	'0.1226'
\gamma_L	'0.1971'	'0.3068'	'0.252'	'0.933'	'0.1144'
k_L	'5.281'	'6.1125'	'5.6968'	'4.7422'	'0.101'
\lambda_{qf}	'0.4786'	'0.6186'	'0.5486'	'0.0788'	'0.1307'
\delta	'0.0578'	'0.0829'	'0.0703'	'0.0385'	'0.1574'
\eta_L	'0.6186'	'0.7377'	'0.6782'	'0.986'	'0.1161'
\vartheta_P	'0.0019'	'0.0044'	'0.0032'	'0.0007'	'0.0744'
\gamma_H	'0.31'	'0.4486'	'0.3793'	'0.3432'	'0.1545'
z	'0.6413'	'1.3116'	'0.9764'	'8.2741'	'0.0678'
\eta_\vartheta	'0.7178'	'0.8066'	'0.7622'	'0.7783'	'0.1131'
a_L	'1.921'	'3.2826'	'2.6018'	'14.6921'	'0.1102'
b_L	'11.5885'	'13.5948'	'12.5917'	'4.1059'	'0.1223'
a_\mu	'8.7595'	'10.6466'	'9.703'	'5.2969'	'0.1345'
b_\mu	'4.0004'	'6.3749'	'5.1877'	'14.3409'	'0.1567'
\mu	'0'	'0.069'	'0.0201'	'0.0084'	'0.0889'
a_H	'8.9077'	'11.1698'	'10.0388'	'1.917'	'0.1623'
b_H	'2.779'	'3.8613'	'3.3202'	'1.0614'	'0.1228'
\nu	'2.8944'	'10.8124'	'6.8534'	'0.0064'	'0.1026'
BP	'388.4957'	'390.5043'	'389.5'	'384.4999'	'0.1132'

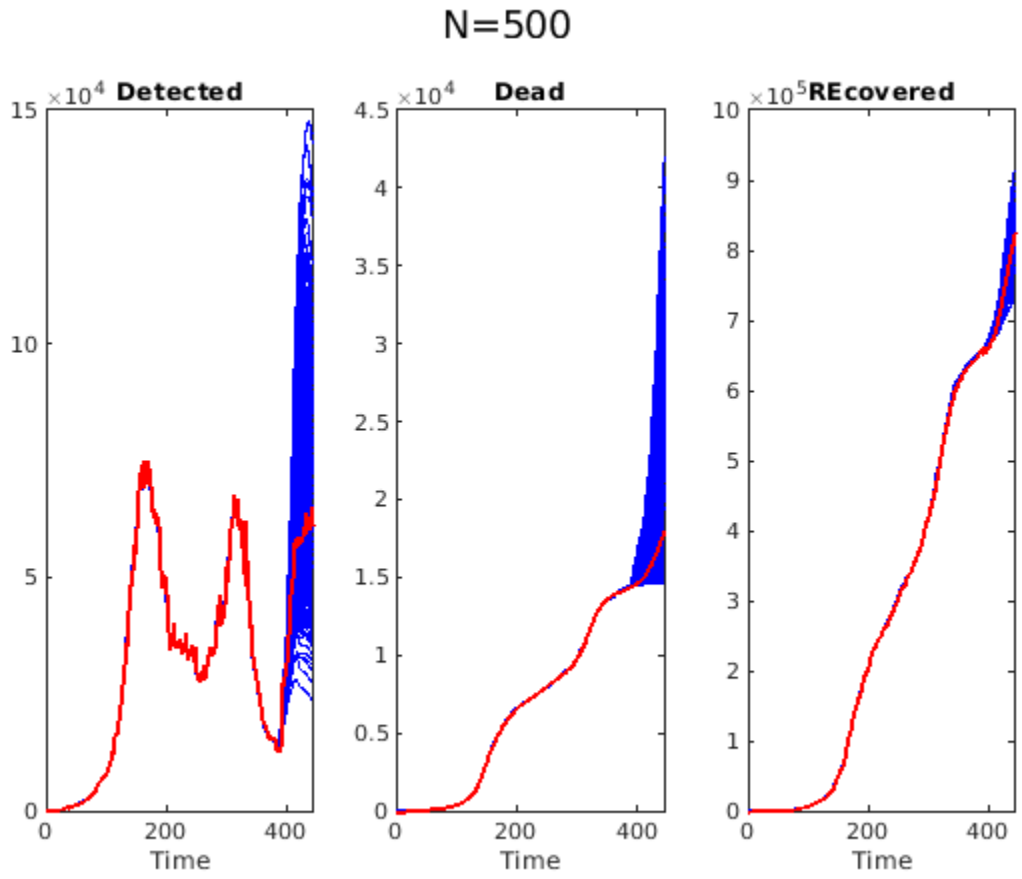
10.3. Identifiability analisys




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


Strong correlations
Identifiability Index
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07

10.4. Uncertainty analisys



Chapter 11. Extension number11

11.1. Basic information

The extension to be validated consists of the time series from the data444 to the 464. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

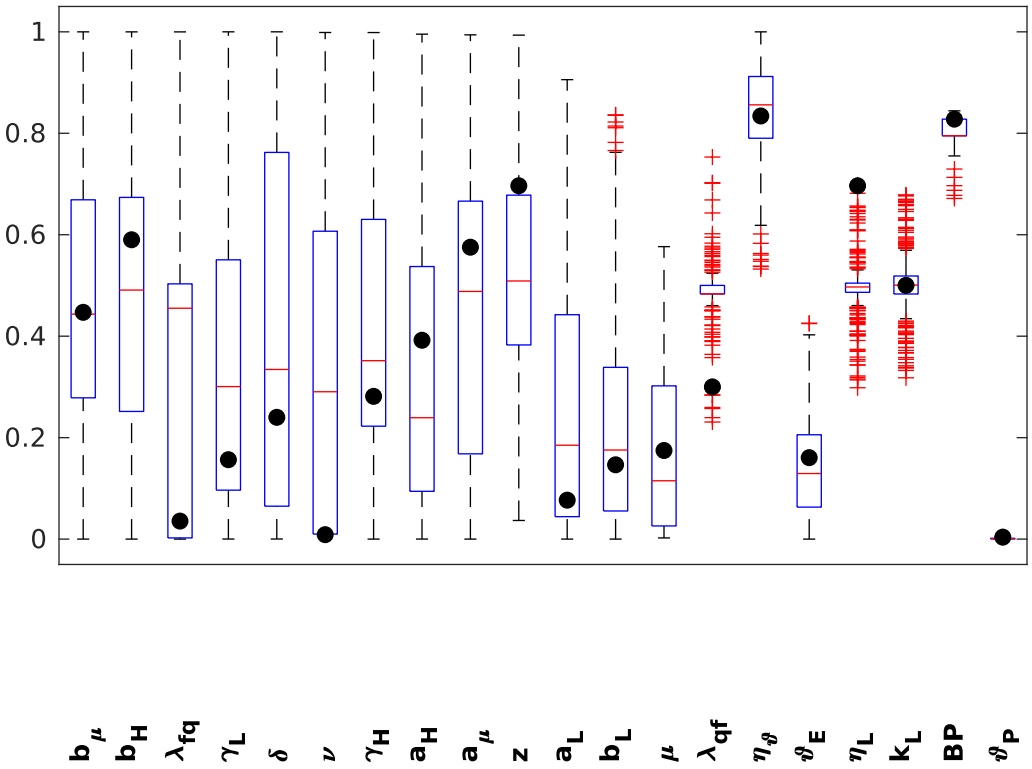
11.2. Estimated parameters with their intervals

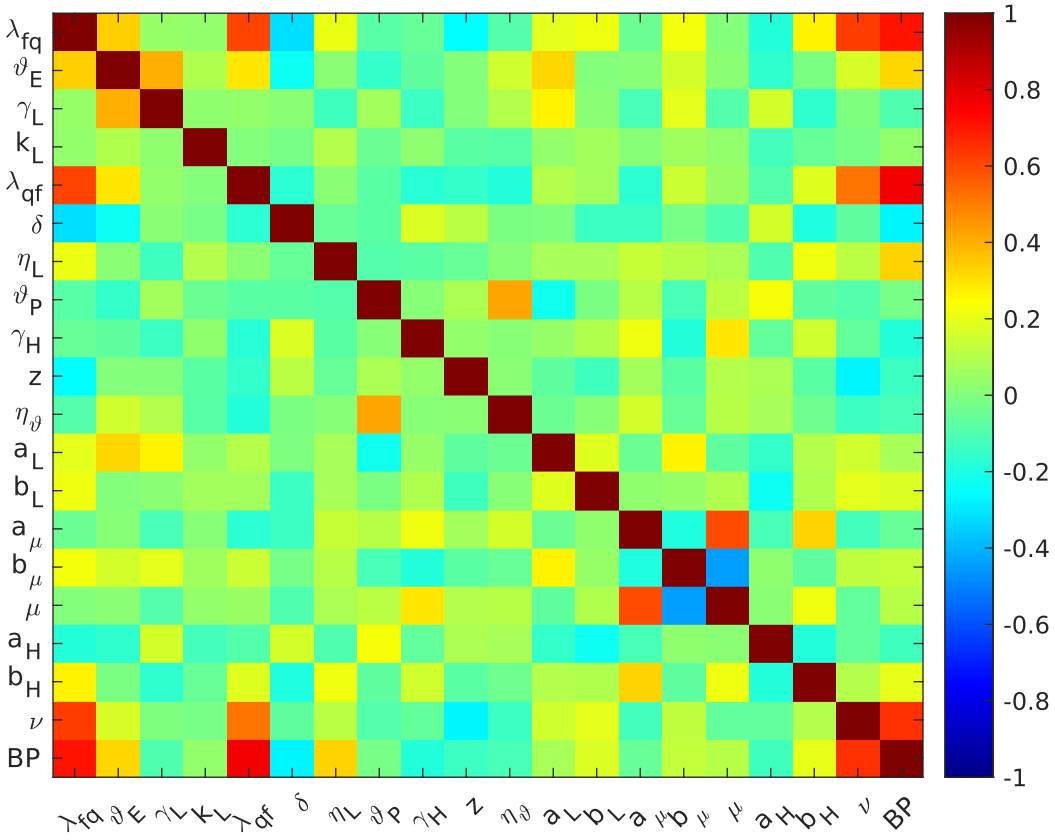
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

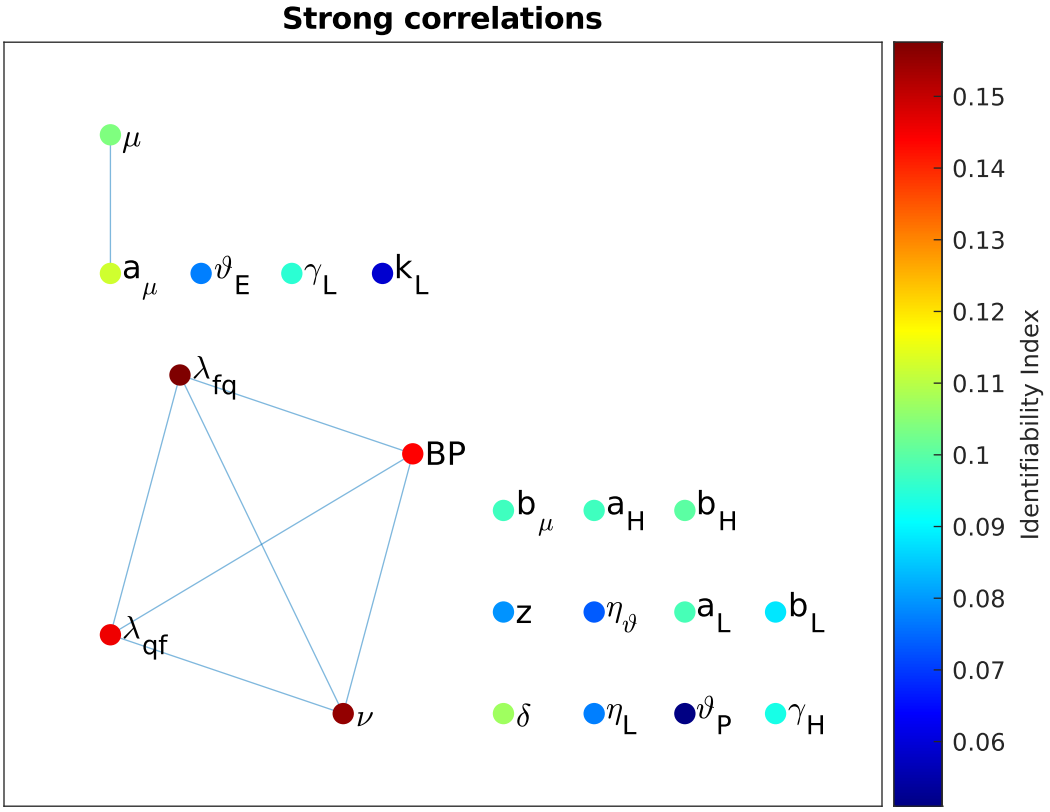
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0036'	'0.0768'	'0.4551'	'0.0355'	'0.1576'
\vartheta_E	'0.126'	'0.2781'	'0.1293'	'0.1605'	'0.0772'
\gamma_L	'0.1278'	'0.2735'	'0.3007'	'0.1565'	'0.0952'
k_L	'1.225'	'9.2278'	'5.5059'	'5.5019'	'0.0591'
\lambda_{qf}	'0.1432'	'0.8633'	'0.4833'	'0.3001'	'0.1455'
\delta	'0.0031'	'0.0778'	'0.0502'	'0.036'	'0.1075'
\eta_L	'0.0691'	'0.9628'	'0.497'	'0.6965'	'0.0775'
\vartheta_P	'0.0021'	'0.0065'	'0.0008'	'0.0039'	'0.051'
\gamma_H	'0'	'0.6079'	'0.3517'	'0.2814'	'0.0931'
z	'3.4033'	'27.84'	'15.2651'	'20.8963'	'0.0795'
\eta_\vartheta	'0.7913'	'0.9894'	'0.8561'	'0.8341'	'0.0735'
a_L	'1.8598'	'5.1241'	'3.5904'	'2.0747'	'0.0981'
b_L	'1.7321'	'6.8493'	'3.4587'	'3.0506'	'0.0884'
a_\mu	'7.3804'	'15'	'7.8353'	'9.0558'	'0.1125'
b_\mu	'1'	'10.2365'	'7.2089'	'7.2586'	'0.0975'
\mu	'0'	'0.2671'	'0.115'	'0.1747'	'0.1042'
a_H	'2.813'	'14.0037'	'4.3496'	'6.4884'	'0.0973'
b_H	'1'	'15'	'7.8732'	'9.2613'	'0.1005'
\nu	'4.1635'	'7.8832'	'145.2489'	'4.3717'	'0.1554'
BP	'443.4768'	'447.7201'	'441.5'	'443.4994'	'0.144'

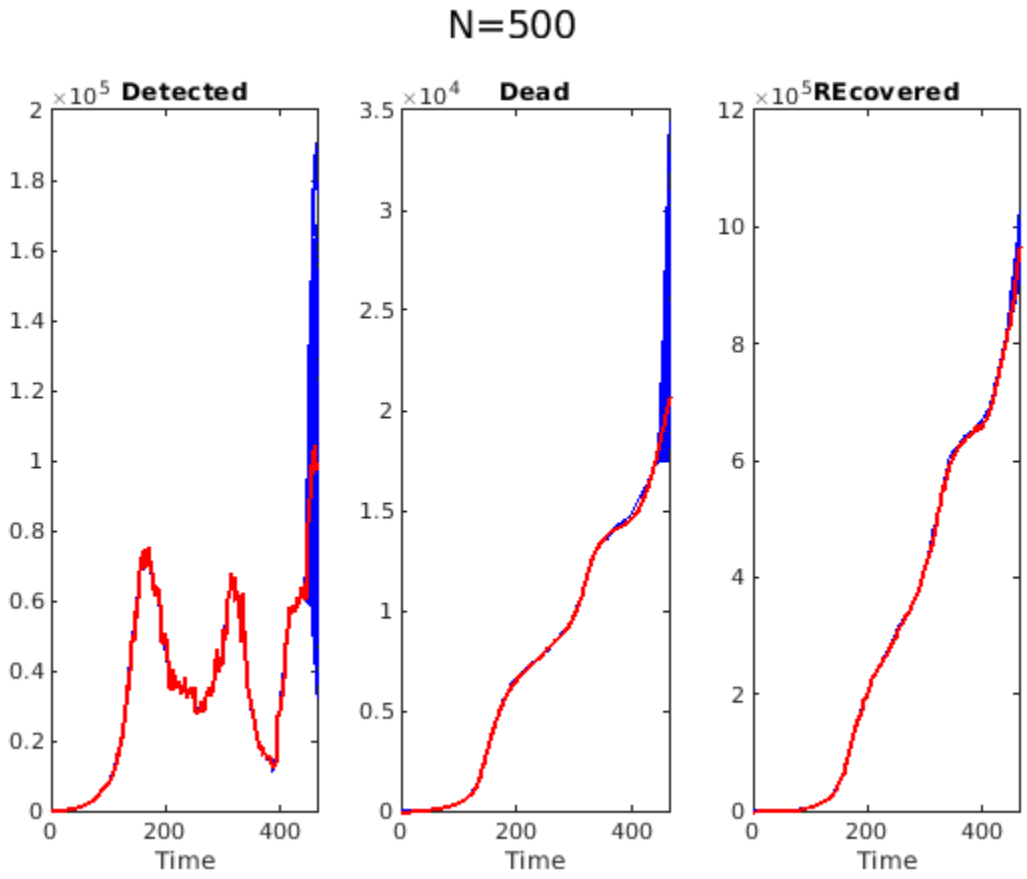
11.3. Identifiability analisys




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


Strong correlations
μ
a_{μ}
ϑ_E
γ_L
k_L
λ_{fq}
BP
b_{μ}
a_H
b_H
z
η_{ϑ}
a_L
b_L
λ_{qf}
ν
δ
η_L
ϑ_P
γ_H
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 data464 to the 486. The status of the validation is: COMPLETED.

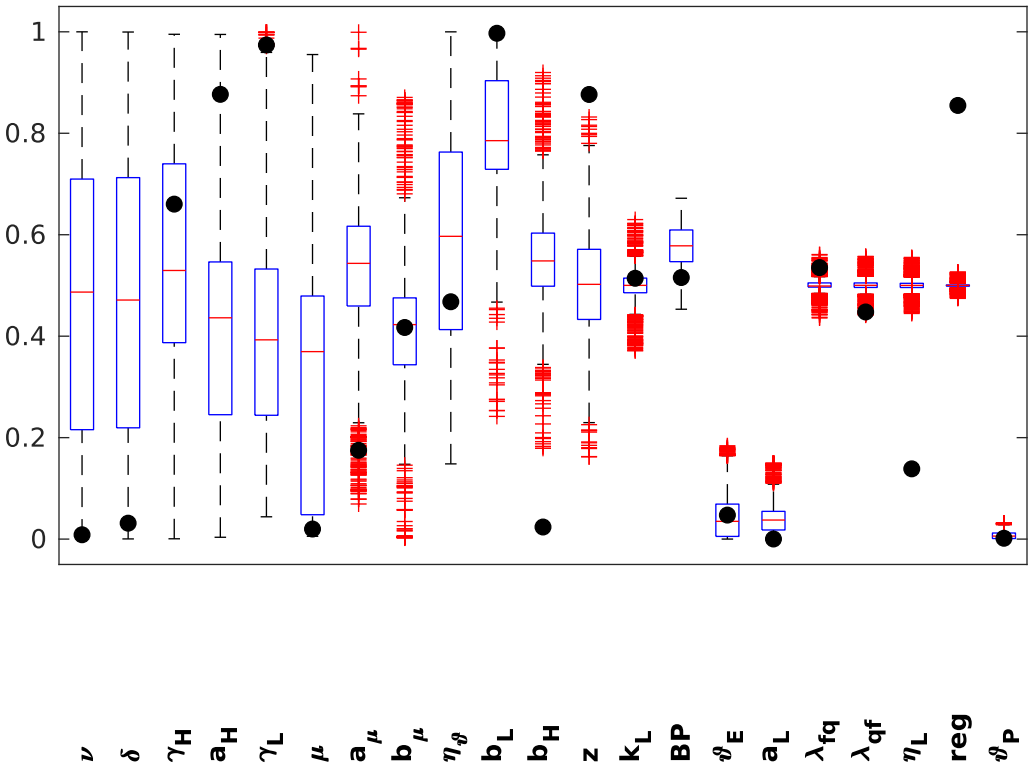
The number of estimations needed to perform the validation was1000.

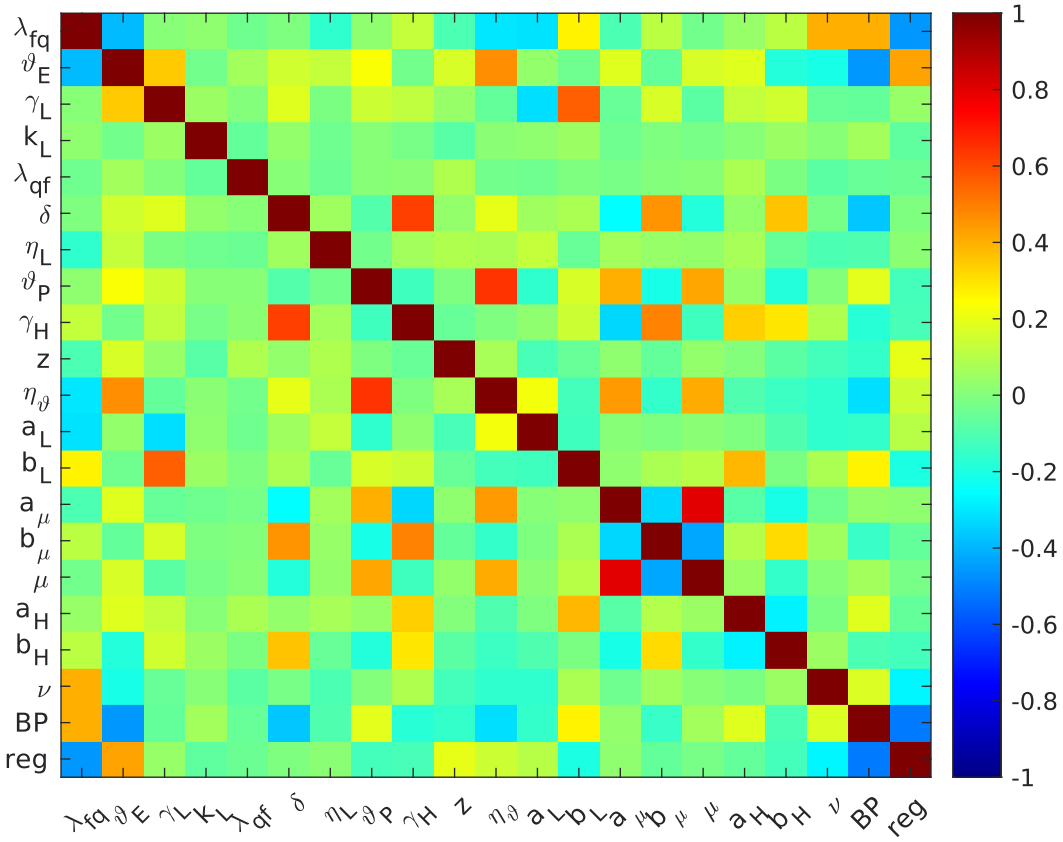
12.2. Estimated parameters with their intervals

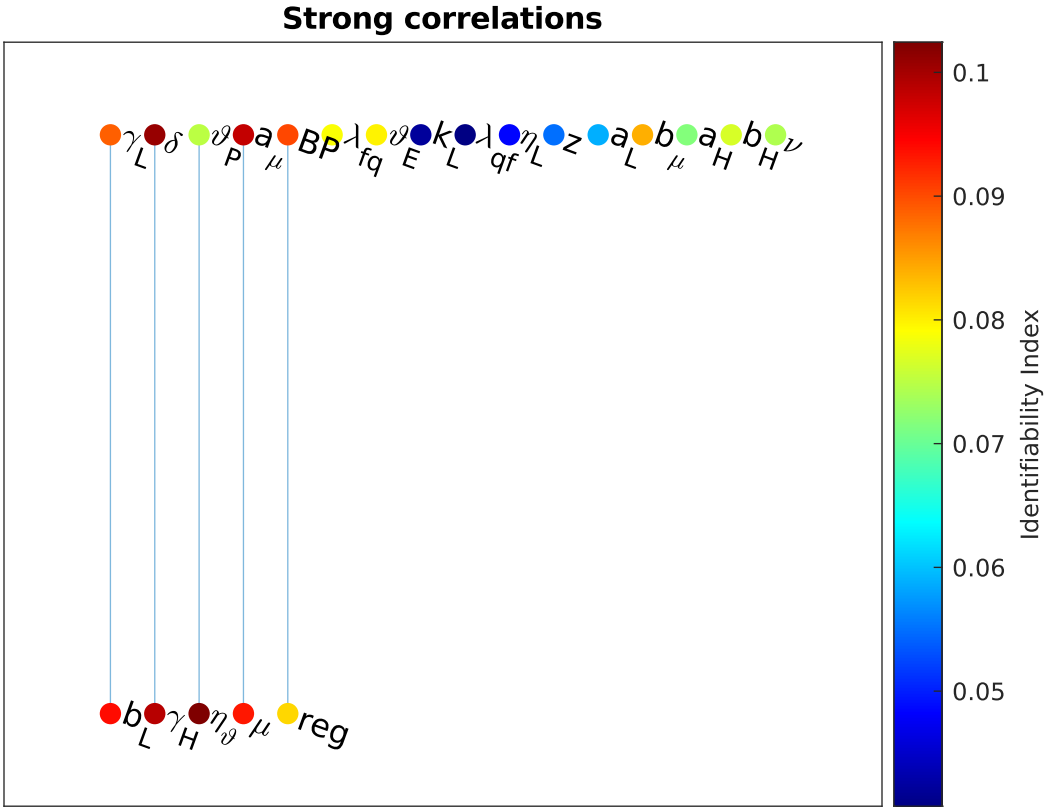
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4845'	'0.5134'	'0.4989'	'0.5351'	'0.0789'
\vartheta_E	'0.026'	'0.044'	'0.035'	'0.0473'	'0.0798'
\gamma_L	'0.3705'	'0.4151'	'0.3928'	'0.974'	'0.0888'
k_L	'5.4127'	'5.5904'	'5.5016'	'5.6272'	'0.0423'
\lambda_{qf}	'0.4919'	'0.5087'	'0.5003'	'0.4477'	'0.0407'
\delta	'0.0666'	'0.0747'	'0.0707'	'0.0047'	'0.1008'
\eta_L	'0.4918'	'0.5085'	'0.5001'	'0.1385'	'0.0485'
\vartheta_P	'0.0048'	'0.0071'	'0.0059'	'0.0017'	'0.0751'
\gamma_H	'0.5059'	'0.5532'	'0.5295'	'0.6603'	'0.0988'
z	'14.6939'	'15.4374'	'15.0657'	'26.2947'	'0.055'
\eta_\vartheta	'0.5787'	'0.615'	'0.5968'	'0.4679'	'0.1024'
a_L	'1.3901'	'1.6637'	'1.5269'	'1.0028'	'0.0589'
b_L	'11.6527'	'12.3344'	'11.9935'	'14.9598'	'0.094'
a_\mu	'8.315'	'8.9027'	'8.6089'	'3.4514'	'0.0982'
b_\mu	'6.6211'	'7.2182'	'6.9196'	'6.8401'	'0.0841'
\mu	'0.3494'	'0.3897'	'0.3696'	'0.0198'	'0.0933'
a_H	'6.8049'	'7.4101'	'7.1075'	'13.2743'	'0.0716'
b_H	'8.4269'	'8.9275'	'8.6772'	'1.3335'	'0.0769'
\nu	'230.8056'	'256.1267'	'243.4662'	'4.2813'	'0.0744'
BP	'462.2711'	'462.7289'	'462.5'	'460.4997'	'0.0903'
reg	'0.1226'	'0.1275'	'0.125'	'0.2137'	'0.0815'

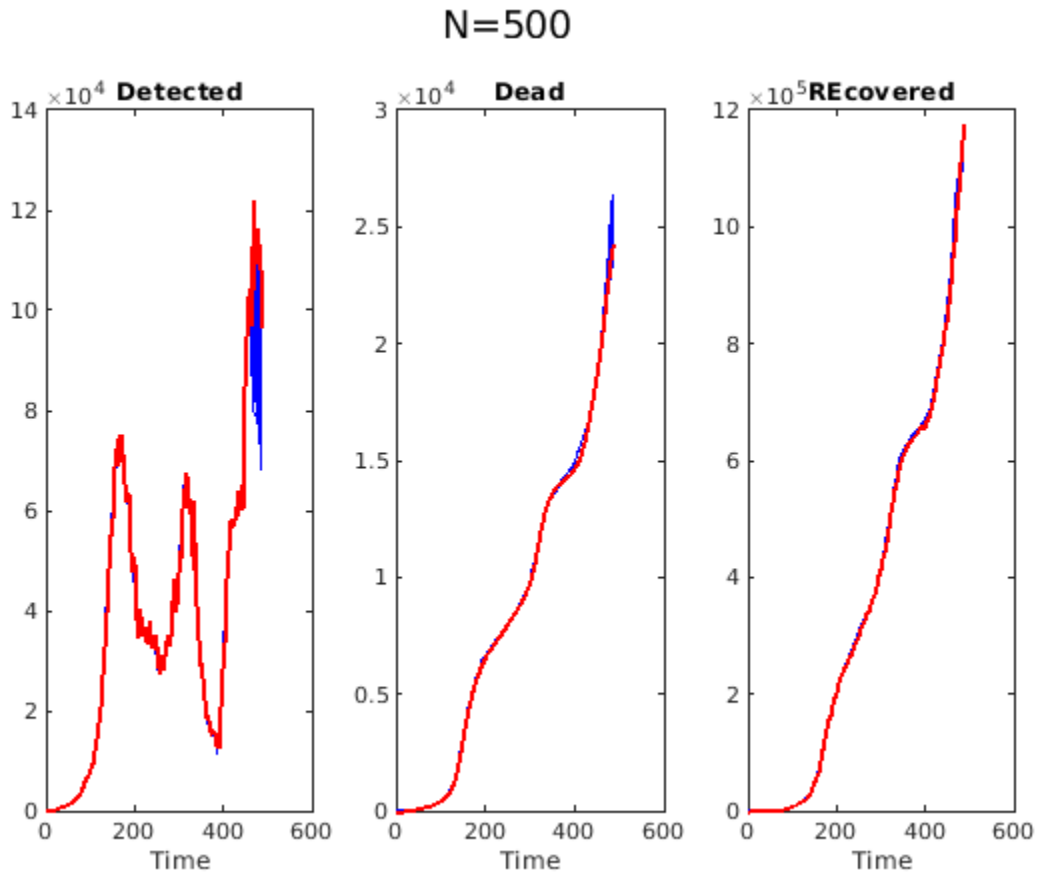
12.3. Identifiability analisys




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


Strong correlations
γ_L δ ϑ_P a_μ BP λ_{fq} ϑ_E k_L λ_{qf} η_L z a_L b_μ a_H b_H ν
b_L γ_H η_ϑ μ reg
0.1
0.09
0.08
0.07
0.06
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 data486 to the 501. The status of the validation is: COMPLETED.

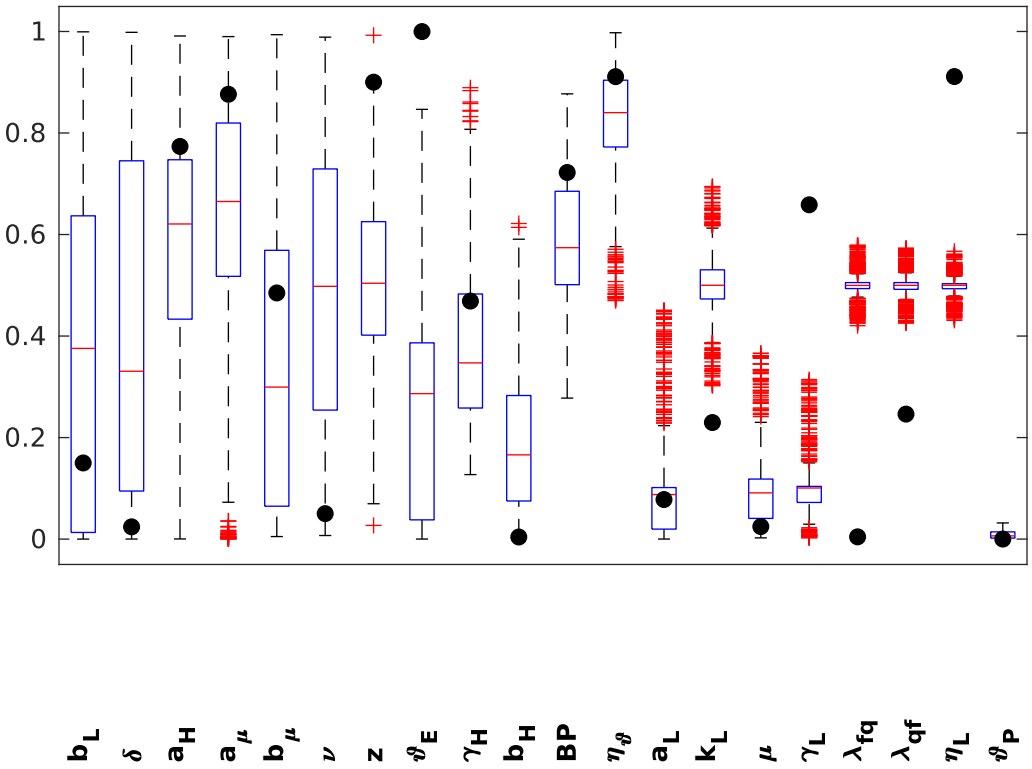
The number of estimations needed to perform the validation was1000.

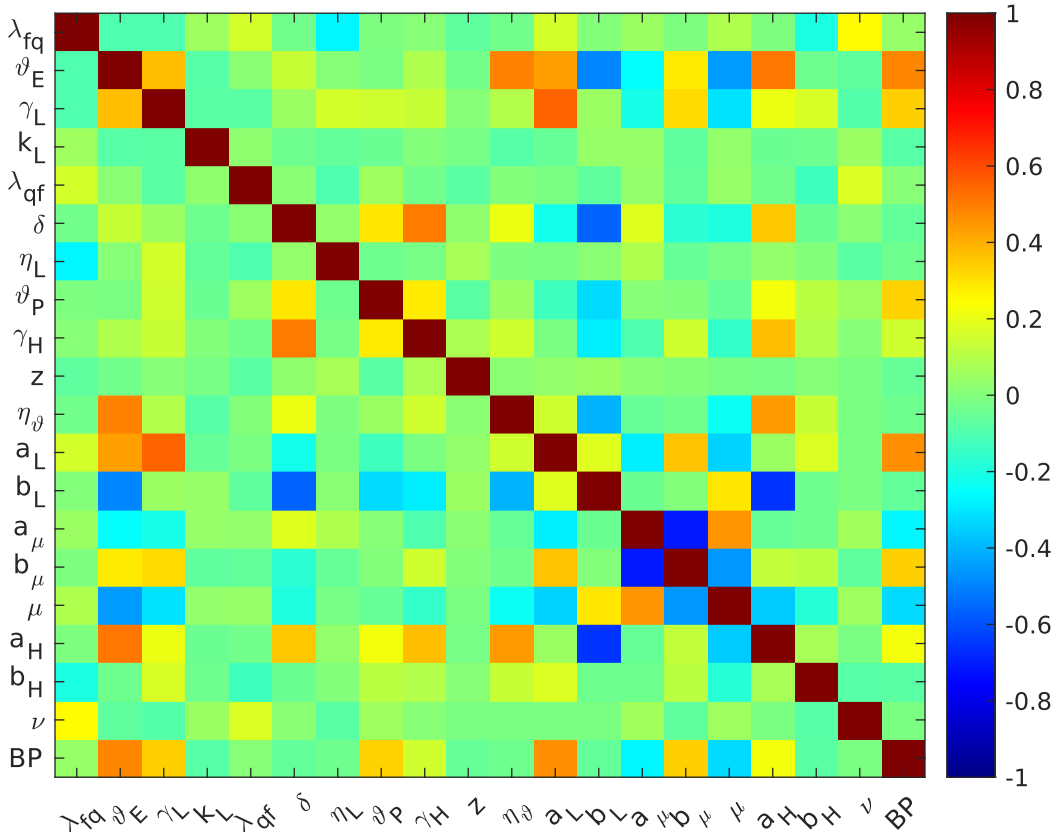
13.2. Estimated parameters with their intervals

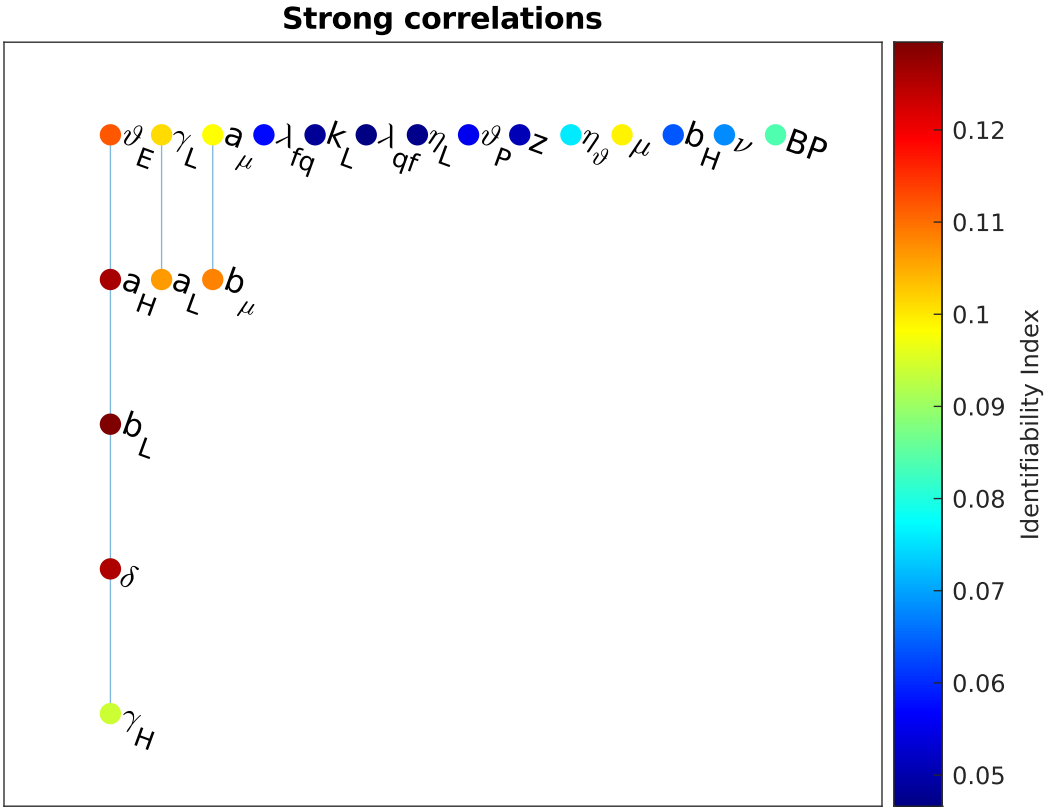
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4875'	'0.5119'	'0.4997'	'0.0044'	'0.0574'
\vartheta_E	'0.2664'	'0.3067'	'0.2866'	'0.9998'	'0.1119'
\gamma_L	'0.0801'	'0.1213'	'0.1007'	'0.6586'	'0.1012'
k_L	'5.3963'	'5.6044'	'5.5003'	'3.0668'	'0.0483'
\lambda_{qf}	'0.4922'	'0.5077'	'0.4999'	'0.2462'	'0.0466'
\delta	'0.0442'	'0.055'	'0.0496'	'0.0036'	'0.1255'
\eta_L	'0.4914'	'0.5085'	'0.5'	'0.9112'	'0.0473'
\vartheta_P	'0.0041'	'0.0086'	'0.0063'	'0.0001'	'0.0554'
\gamma_H	'0.3237'	'0.3709'	'0.3473'	'0.4689'	'0.0941'
z	'14.5993'	'15.6415'	'15.1204'	'27.0043'	'0.0511'
\eta_\vartheta	'0.8218'	'0.8582'	'0.84'	'0.911'	'0.076'
a_L	'1.9038'	'2.5534'	'2.2286'	'2.0912'	'0.1063'
b_L	'5.7717'	'6.7477'	'6.2597'	'3.1001'	'0.1295'
a_\mu	'9.9724'	'10.6494'	'10.3109'	'13.2681'	'0.0984'
b_\mu	'4.7826'	'5.6028'	'5.1927'	'7.7887'	'0.1083'
\mu	'0.0676'	'0.1153'	'0.0915'	'0.0247'	'0.0994'
a_H	'9.2867'	'10.0956'	'9.6911'	'11.8291'	'0.1262'
b_H	'3.0829'	'3.5715'	'3.3272'	'1.0579'	'0.0639'
\nu	'234.5458'	'263.4079'	'248.9768'	'25.0981'	'0.0681'
BP	'479.0484'	'479.9515'	'479.5'	'483.5'	'0.0842'

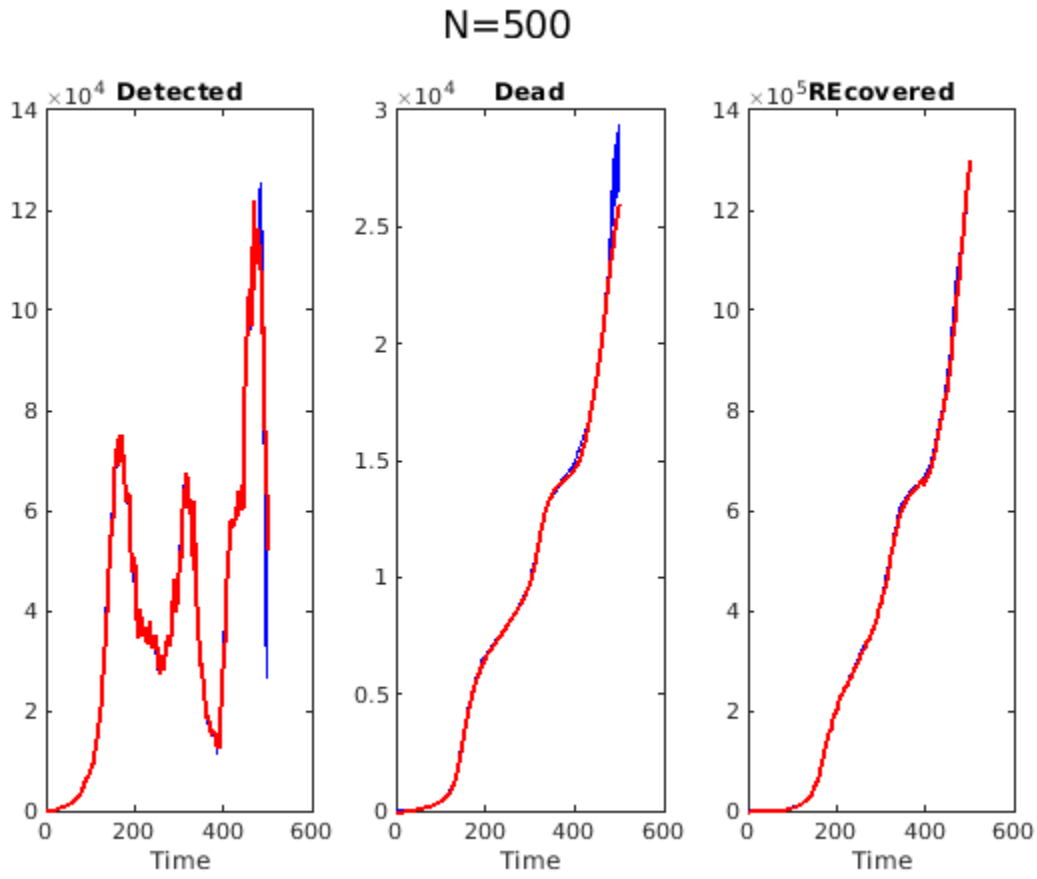
13.3. Identifiability analisys




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
ϑ_E γ_L a_μ λ_{fq} k_L λ_{qf} η_L ϑ_P z η_ϑ μ b_H ν BP
a_H a_L b_μ
b_L
δ
γ_H
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
Identifiability Index

13.4. Uncertainty analisys



Chapter 14. Extension number14

14.1. Basic information

The extension to be validated consists of the time series from the data501 to the 522. The status of the validation is: COMPLETED.

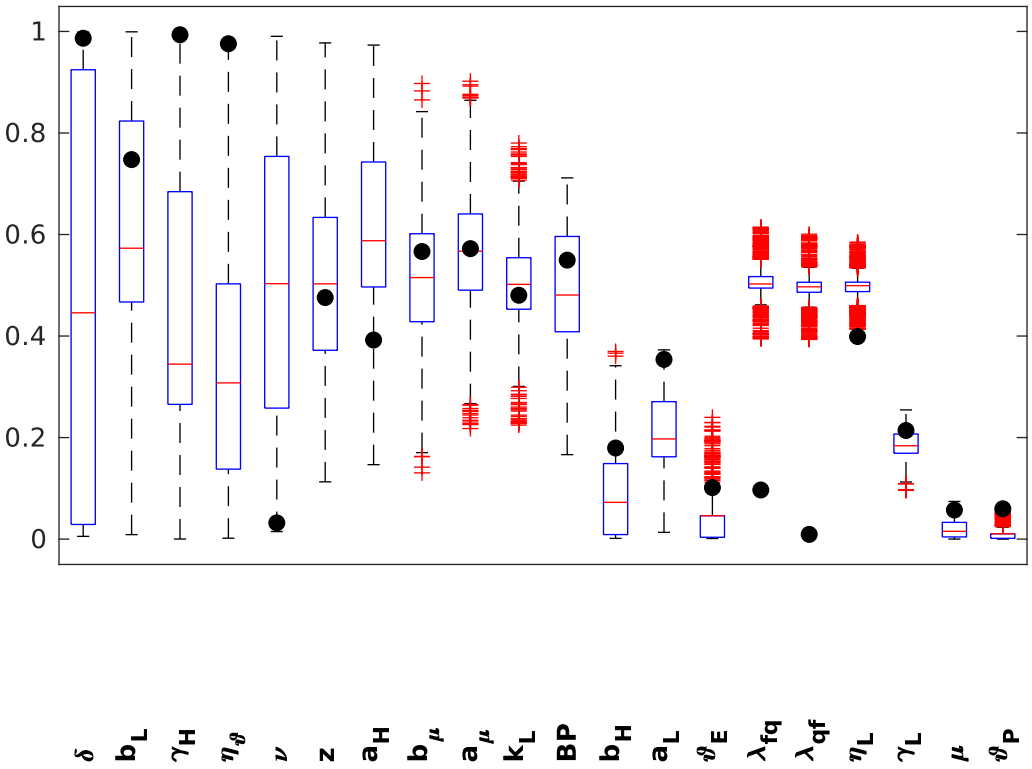
The number of estimations needed to perform the validation was1000.

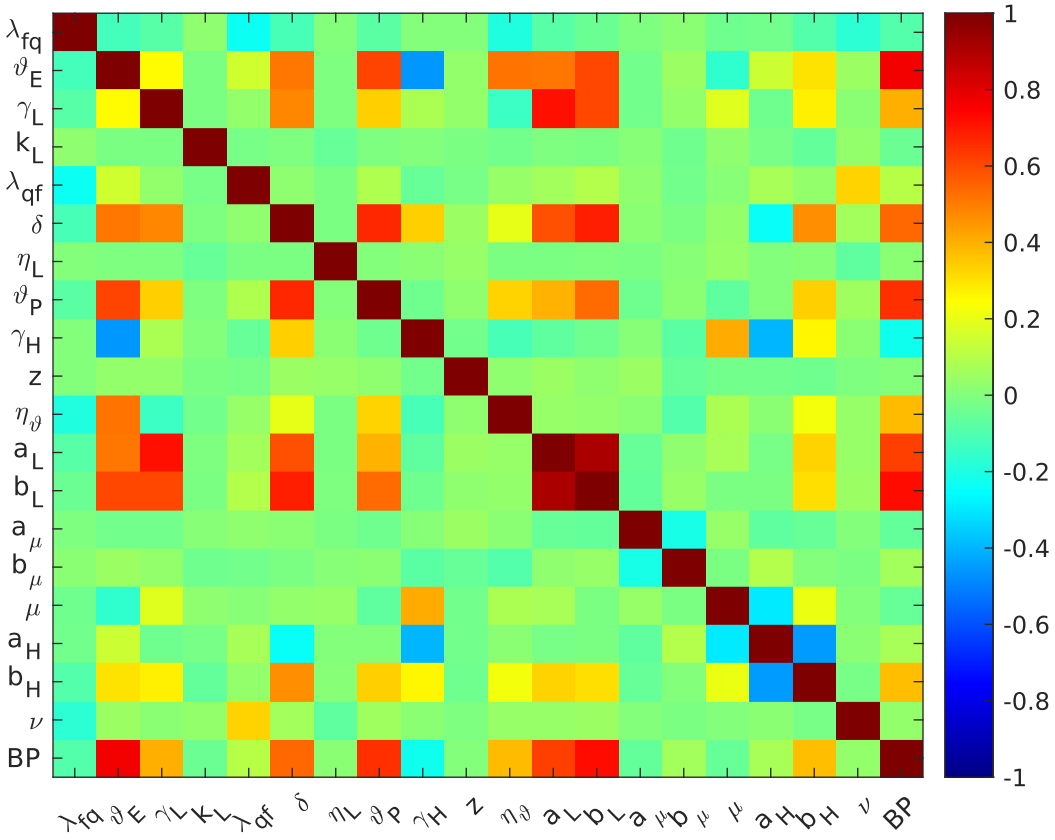
14.2. Estimated parameters with their intervals

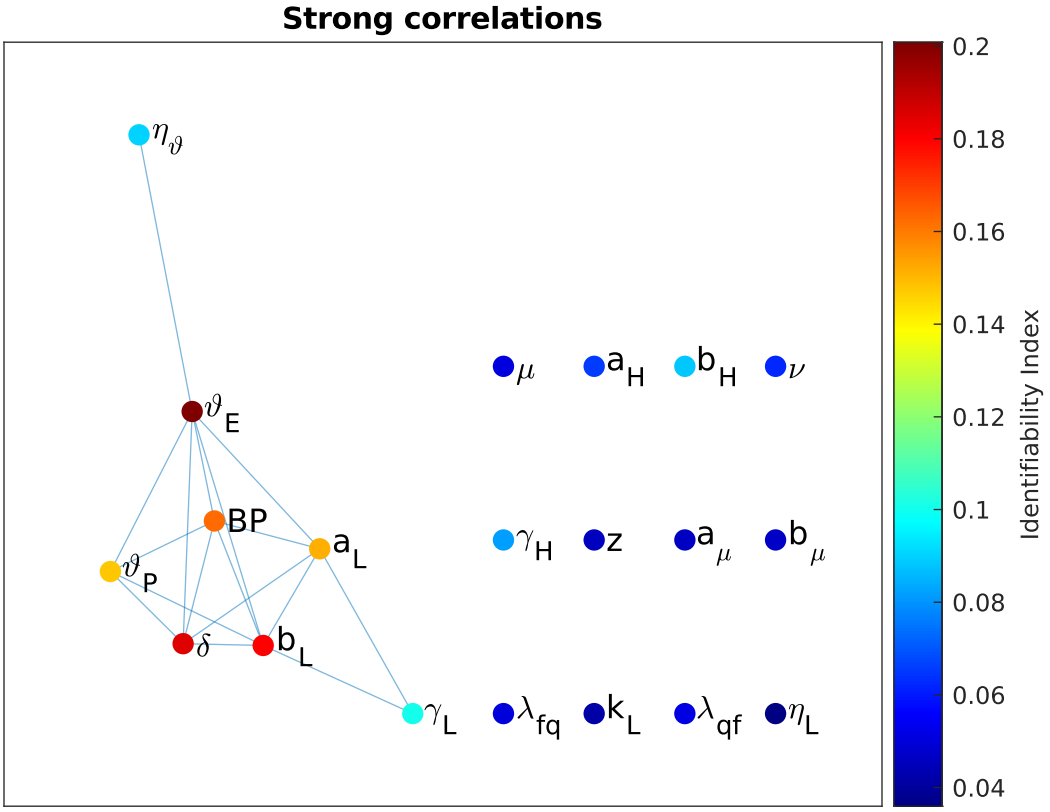
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4945'	'0.5107'	'0.5026'	'0.0967'	'0.0506'
\vartheta_E	'0.0115'	'0.0807'	'0.0461'	'0.1014'	'0.2008'
\gamma_L	'0.1801'	'0.1876'	'0.1839'	'0.2139'	'0.1008'
k_L	'5.4121'	'5.6198'	'5.5159'	'5.323'	'0.0419'
\lambda_{qf}	'0.4885'	'0.5055'	'0.497'	'0.0093'	'0.0516'
\delta	'0.0617'	'0.072'	'0.0669'	'0.148'	'0.1848'
\eta_L	'0.4926'	'0.5059'	'0.4993'	'0.399'	'0.036'
\vartheta_P	'0'	'0.038'	'0.0105'	'0.0597'	'0.1477'
\gamma_H	'0.3208'	'0.3686'	'0.3447'	'0.9935'	'0.0819'
z	'14.6568'	'15.5113'	'15.0841'	'14.2749'	'0.0463'
\eta_\vartheta	'0.2865'	'0.329'	'0.3077'	'0.9758'	'0.0904'
a_L	'3.6754'	'3.8482'	'3.7618'	'5.9554'	'0.1514'
b_L	'8.7441'	'9.3'	'9.022'	'11.4656'	'0.1798'
a_\mu	'8.7743'	'9.1074'	'8.9408'	'9.0097'	'0.0465'
b_\mu	'8.0537'	'8.3716'	'8.2126'	'8.9307'	'0.0475'
\mu	'0.0116'	'0.0189'	'0.0153'	'0.0573'	'0.051'
a_H	'9.013'	'9.4436'	'9.2283'	'6.4907'	'0.0658'
b_H	'1.8021'	'2.2244'	'2.0132'	'3.512'	'0.0882'
\nu	'239.2815'	'263.8306'	'251.5561'	'15.9732'	'0.0627'
BP	'498.2501'	'498.7499'	'498.5'	'500.2878'	'0.1625'

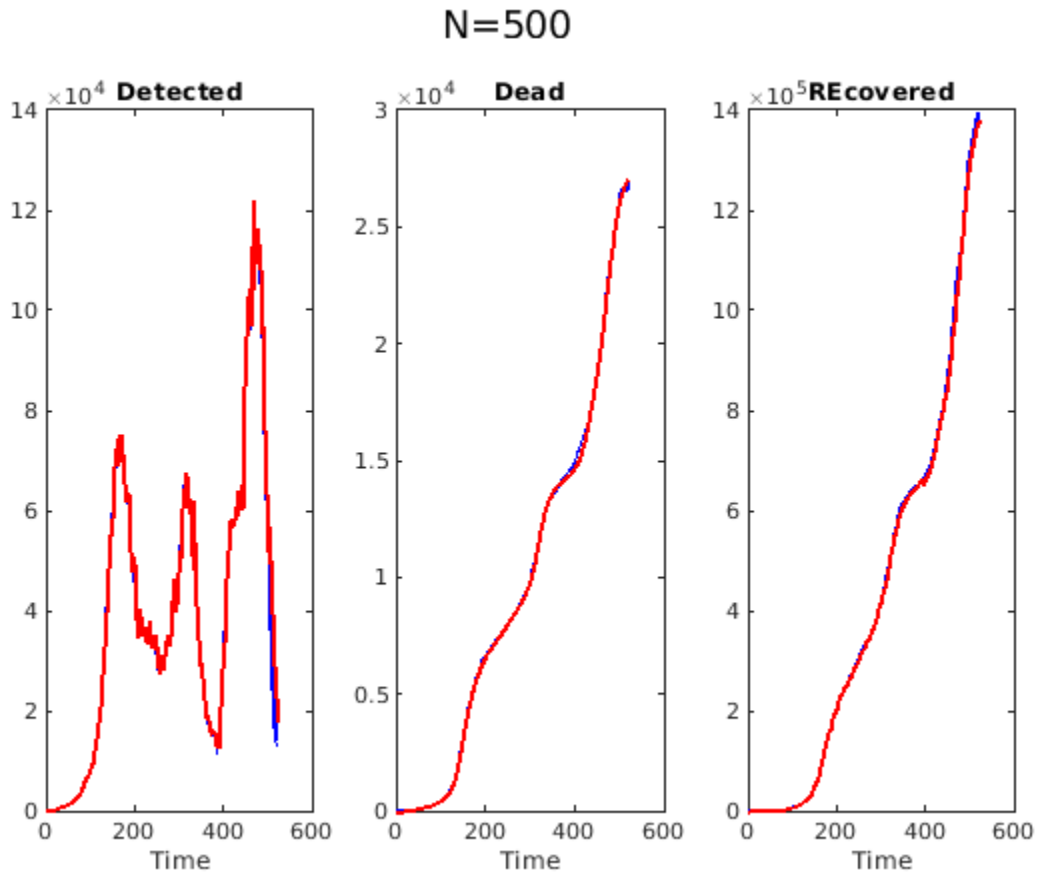
14.3. Identifiability analisys




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
η_ϑ
ϑ_E
BP
a_L
ϑ_P
δ
b_L
γ_L
μ
a_H
b_H
ν
γ_H
z
a_μ
b_μ
λ_{fq}
k_L
λ_{qf}
η_L
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
Identifiability Index

14.4. Uncertainty analisys



Chapter 15. Extension number15

15.1. Basic information

The extension to be validated consists of the time series from the data522 to the 728. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

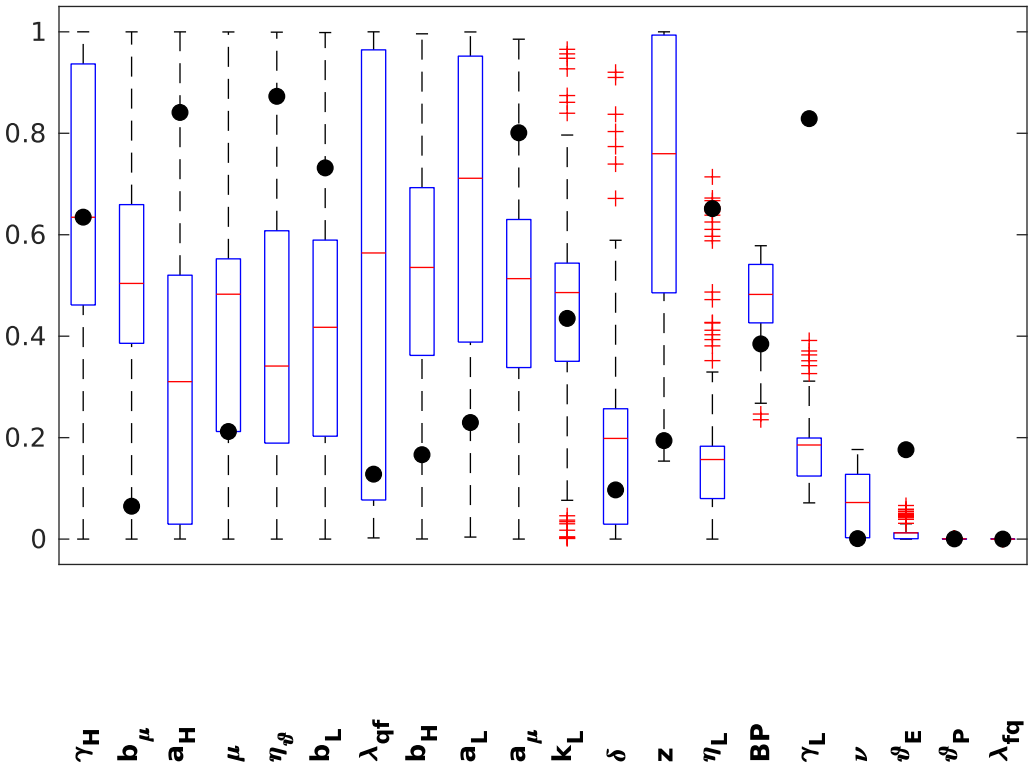
15.2. Estimated parameters with their intervals

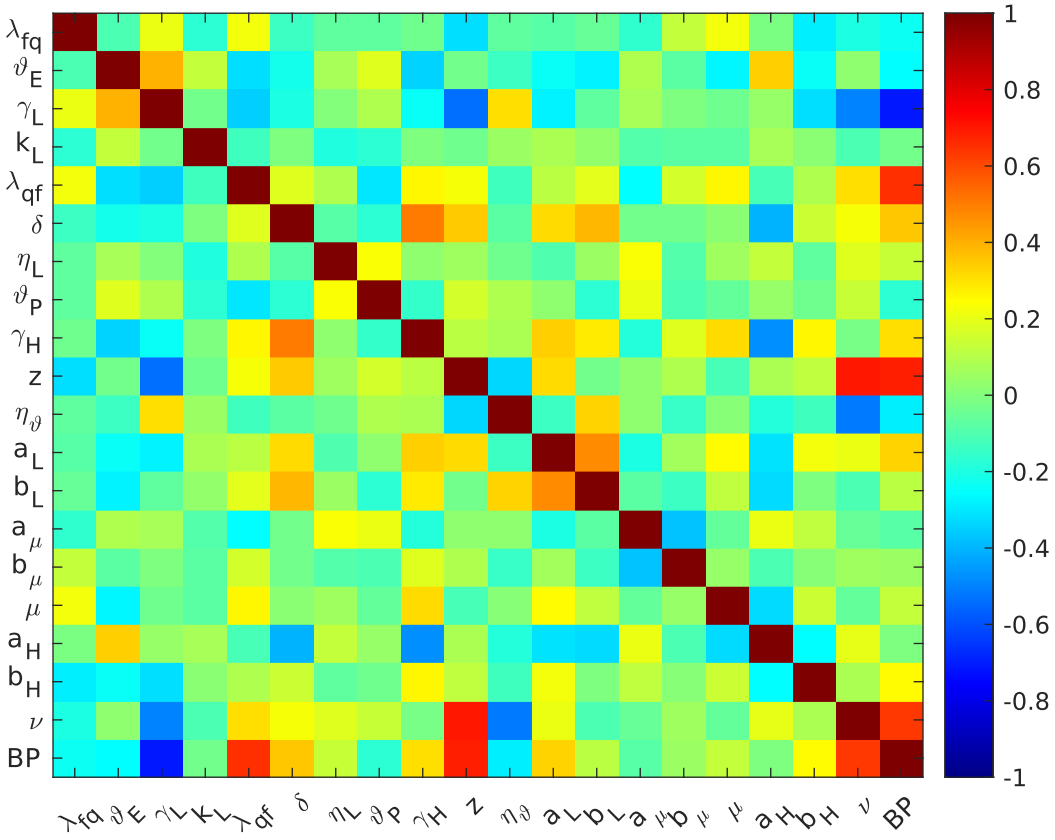
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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'	'0'	'0.0767'
\vartheta_E	'0.1601'	'0.1995'	'0.0126'	'0.1762'	'0.0885'
\gamma_L	'0.4782'	'0.8598'	'0.1863'	'0.8289'	'0.1589'
k_L	'1'	'9.208'	'5.3741'	'4.9156'	'0.0986'
\lambda_{qf}	'0.1205'	'0.2357'	'0.5641'	'0.128'	'0.1798'
\delta	'0'	'0.0159'	'0.03'	'0.0145'	'0.1594'
\eta_L	'0.5001'	'1'	'0.157'	'0.6515'	'0.1194'
\vartheta_P	'0'	'0.0008'	'0.0004'	'0.0004'	'0.0631'
\gamma_H	'0.0679'	'0.92'	'0.6345'	'0.6347'	'0.1592'
z	'5.3277'	'5.8401'	'22.7917'	'5.8246'	'0.1769'
\eta_\vartheta	'0.5091'	'1'	'0.3412'	'0.8729'	'0.1352'
a_L	'3.7998'	'4.6384'	'10.9586'	'4.2169'	'0.1453'
b_L	'9.1011'	'13.3891'	'6.8456'	'11.2454'	'0.1148'
a_\mu	'3.5627'	'15'	'8.1884'	'12.2147'	'0.1096'
b_\mu	'1.35'	'13.6525'	'8.0561'	'1.9073'	'0.1035'
\mu	'0'	'0.4772'	'0.4828'	'0.2121'	'0.1186'
a_H	'1.28'	'14.4512'	'5.3452'	'12.7754'	'0.137'
b_H	'1'	'15'	'8.4974'	'3.3294'	'0.1146'
\nu	'0.1579'	'1.0815'	'36.0593'	'0.4807'	'0.1305'
BP	'584.4811'	'588.1908'	'605.6669'	'584.5'	'0.1605'

15.3. 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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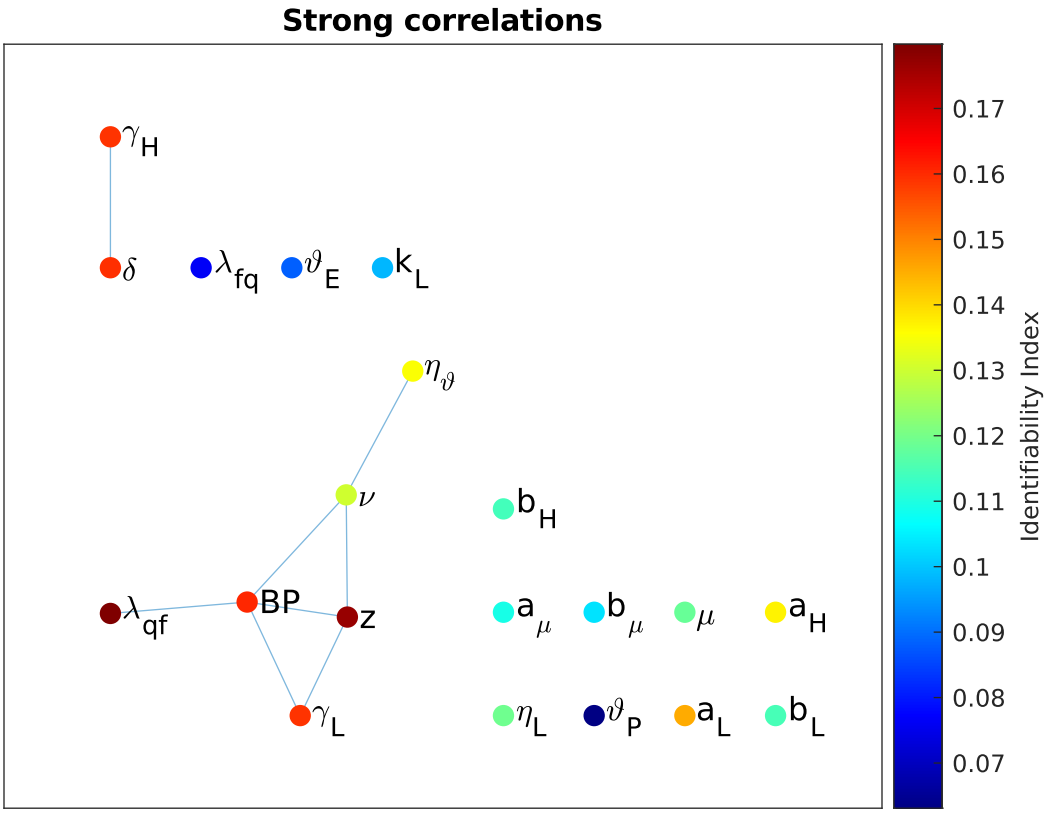
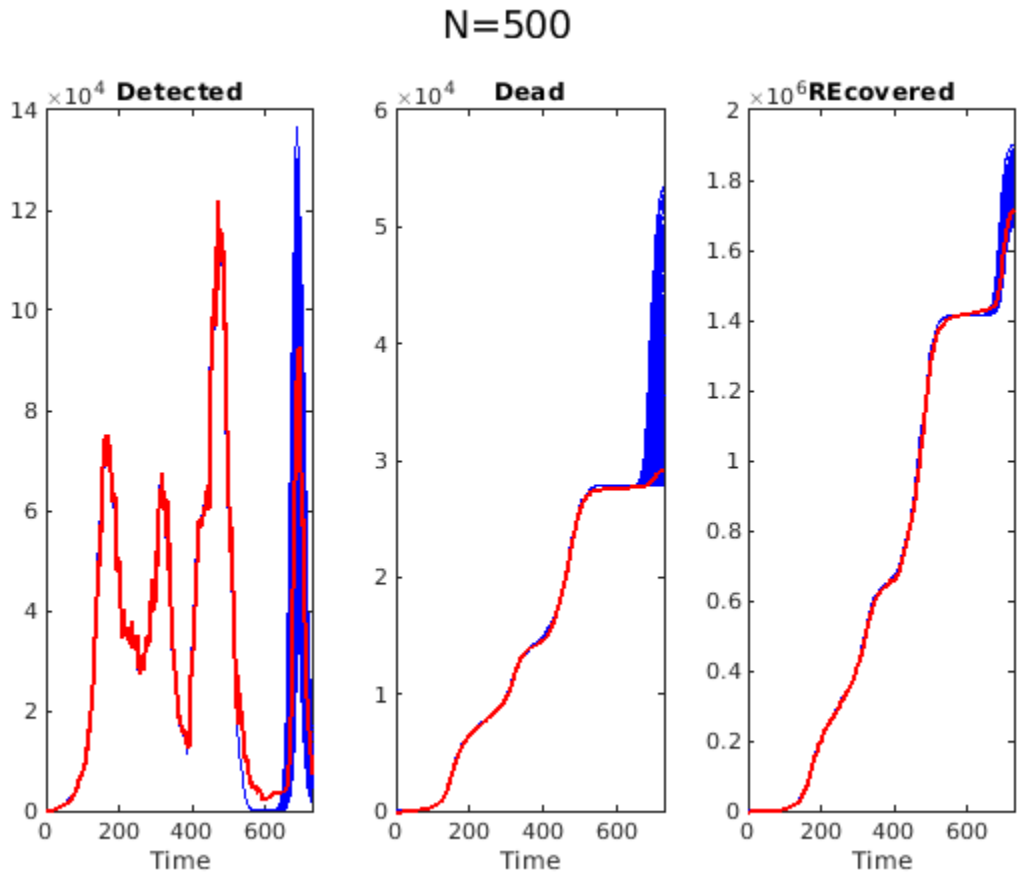
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1


Strong correlations
γ_H
δ
λ_{fq}
ϑ_E
k_L
η_ϑ
ν
b_H
λ_{qf}
BP
z
a_μ
b_μ
μ
a_H
γ_L
η_L
ϑ_P
a_L
b_L
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
Identifiability Index

15.4. Uncertainty analisys