

# **Validation process forBOYACA**

**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 120. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

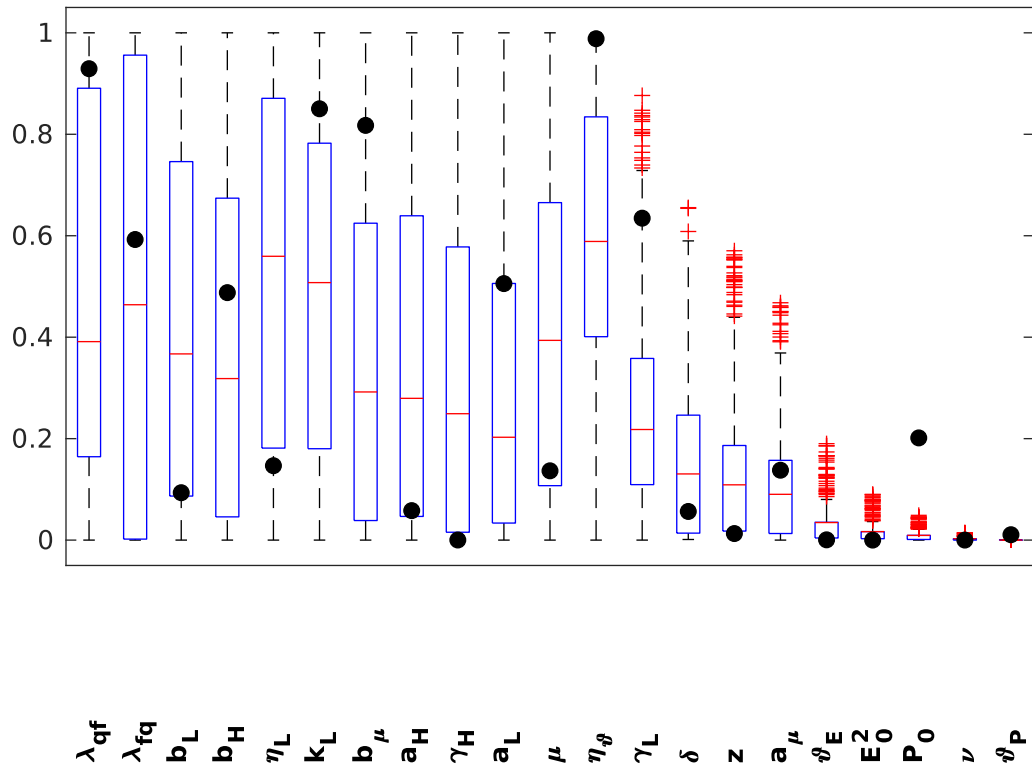
### 1.2. Estimated parameters with their intervals

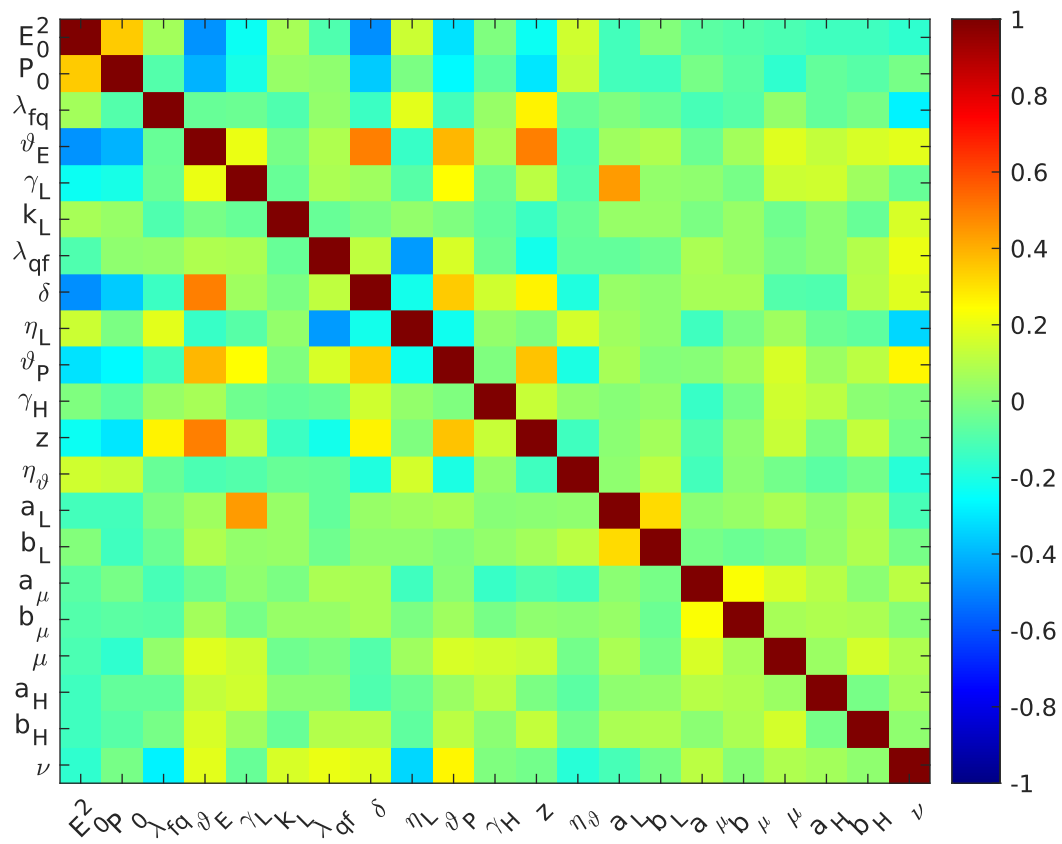
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

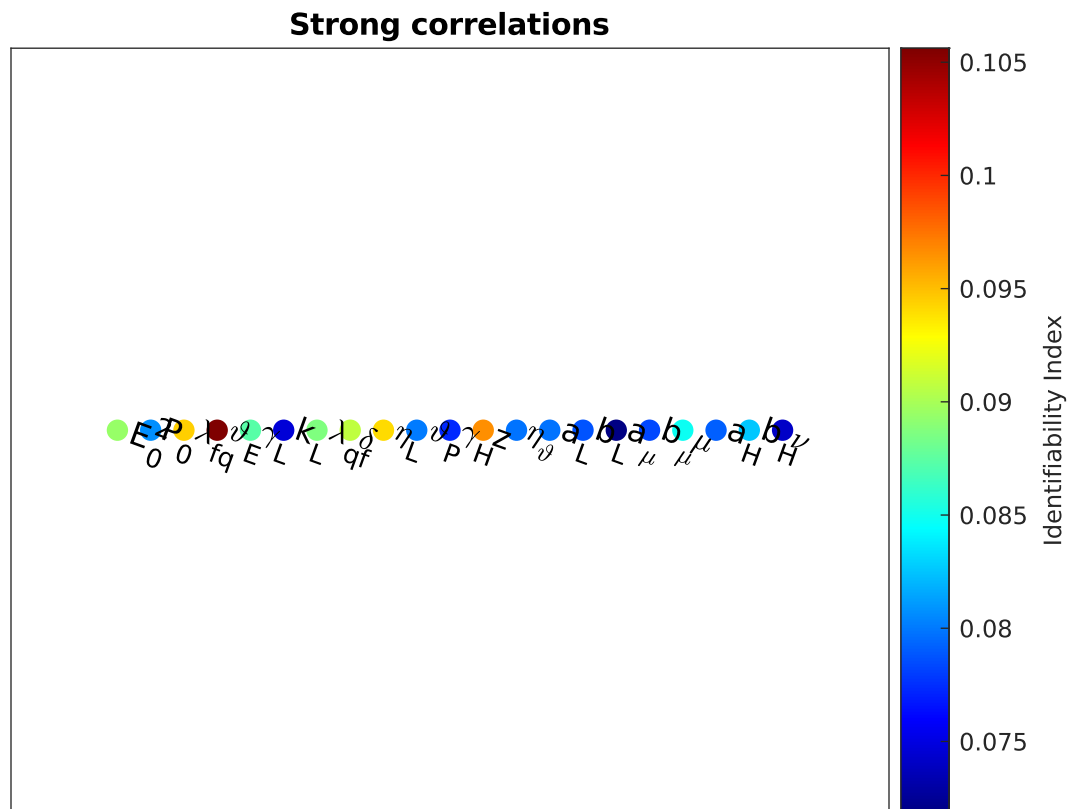
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
E^2_0	'0.0093'	'0.1854'	'33.4447'	'0.0916'	'0.0895'
P_0	'65.0176'	'82.3265'	'3.7392'	'80.5901'	'0.0807'
\lambda_{fq}	'0.5676'	'0.6258'	'0.464'	'0.5926'	'0.0945'
\vartheta_E	'0'	'0.0011'	'0.0352'	'0.0005'	'0.1056'
\gamma_L	'0.4441'	'0.7802'	'0.2187'	'0.6346'	'0.0874'
k_L	'1.225'	'10'	'5.5684'	'8.6525'	'0.0747'
\lambda_{qf}	'0.922'	'0.9345'	'0.3913'	'0.9293'	'0.0887'
\delta	'0.0082'	'0.0106'	'0.0196'	'0.0085'	'0.0908'
\eta_L	'0.1336'	'0.1636'	'0.5595'	'0.1467'	'0.094'
\vartheta_P	'0.0085'	'0.013'	'0.0001'	'0.0106'	'0.0801'
\gamma_H	'0'	'0.0004'	'0.2492'	'0.0002'	'0.0773'
z	'0.3692'	'0.3884'	'3.2718'	'0.3873'	'0.0965'
\eta_{\vartheta}	'0.8942'	'1'	'0.5887'	'0.9884'	'0.0799'
a_L	'7.6872'	'9.0501'	'3.8384'	'8.0793'	'0.0799'
b_L	'1.9594'	'2.4867'	'6.1387'	'2.3079'	'0.0788'
a_{\mu}	'2.4443'	'10.276'	'2.2653'	'2.9288'	'0.0719'
b_{\mu}	'4.9594'	'15'	'5.0887'	'12.4454'	'0.0783'
\mu	'0.1289'	'0.6726'	'0.3937'	'0.1366'	'0.0849'
a_H	'1.315'	'13.6'	'4.9125'	'1.8133'	'0.0792'
b_H	'1.35'	'14.3'	'5.4577'	'7.8297'	'0.0826'
\nu	'0'	'0.0608'	'1.3428'	'0.0307'	'0.0742'

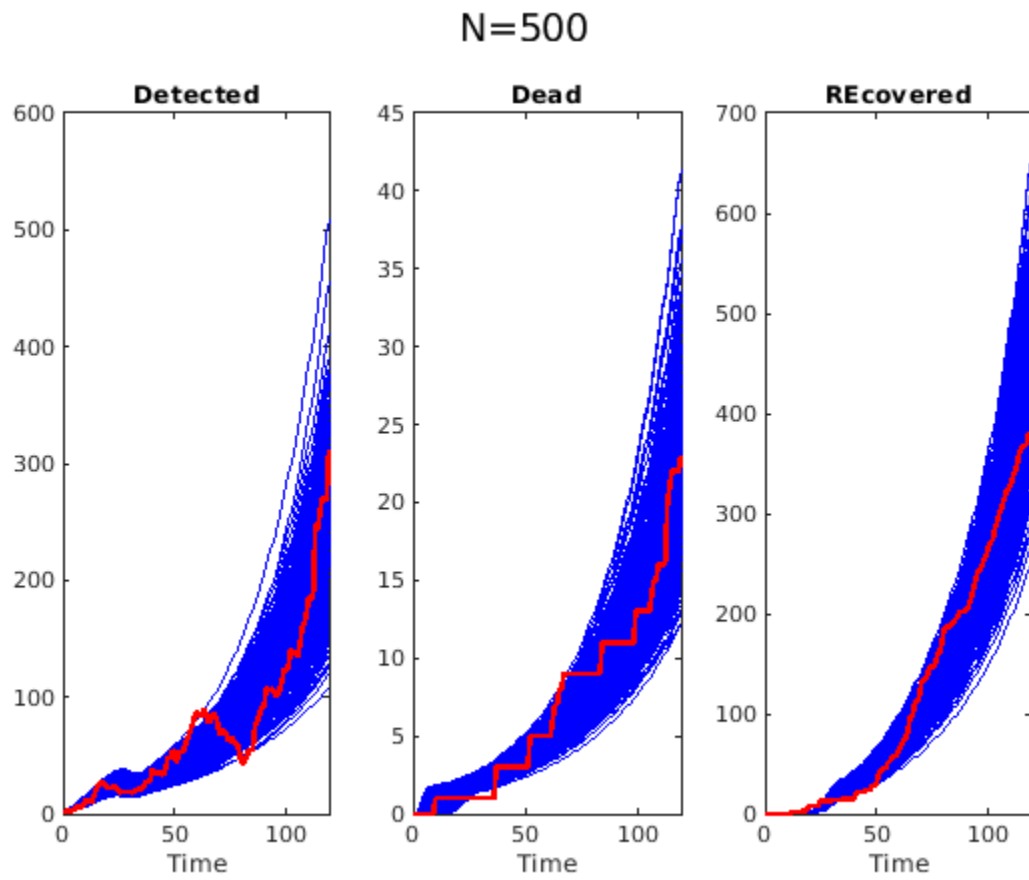
### 1.3. Identifiability analysis







## 1.4. Uncertainty analysis





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## Chapter 2. Extension number2

### 2.1. Basic information

The extension to be validated consists of the time series from the data120 to the 159. The status of the validation is: COMPLETED.

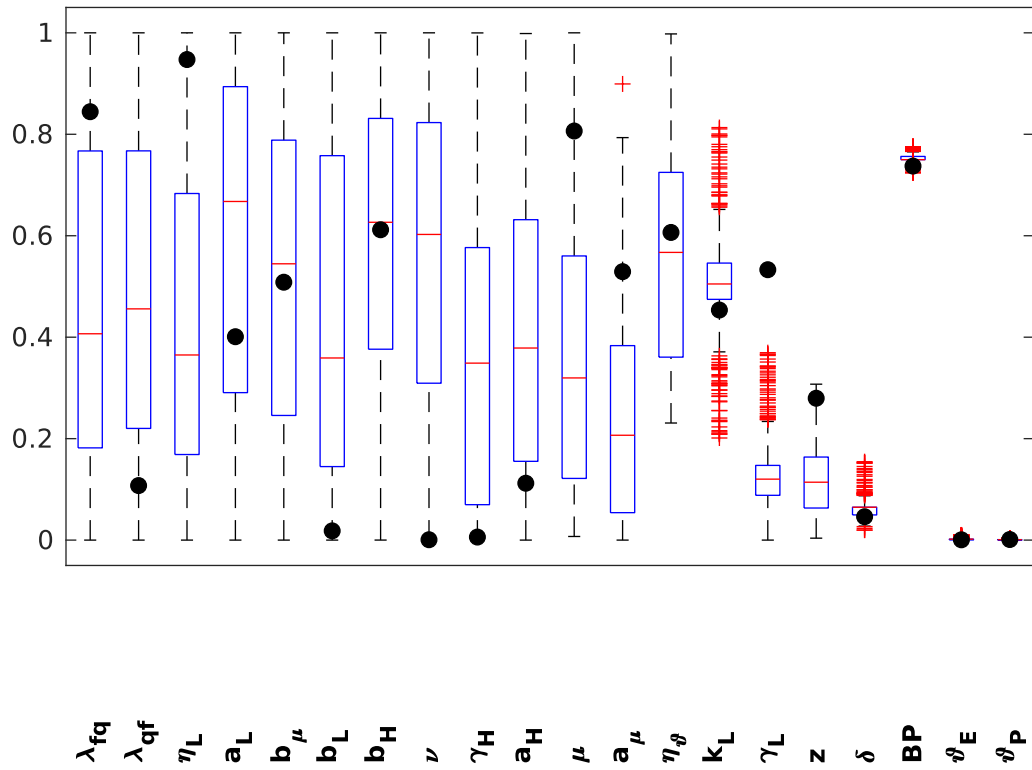
The number of estimations needed to perform the validation was1000.

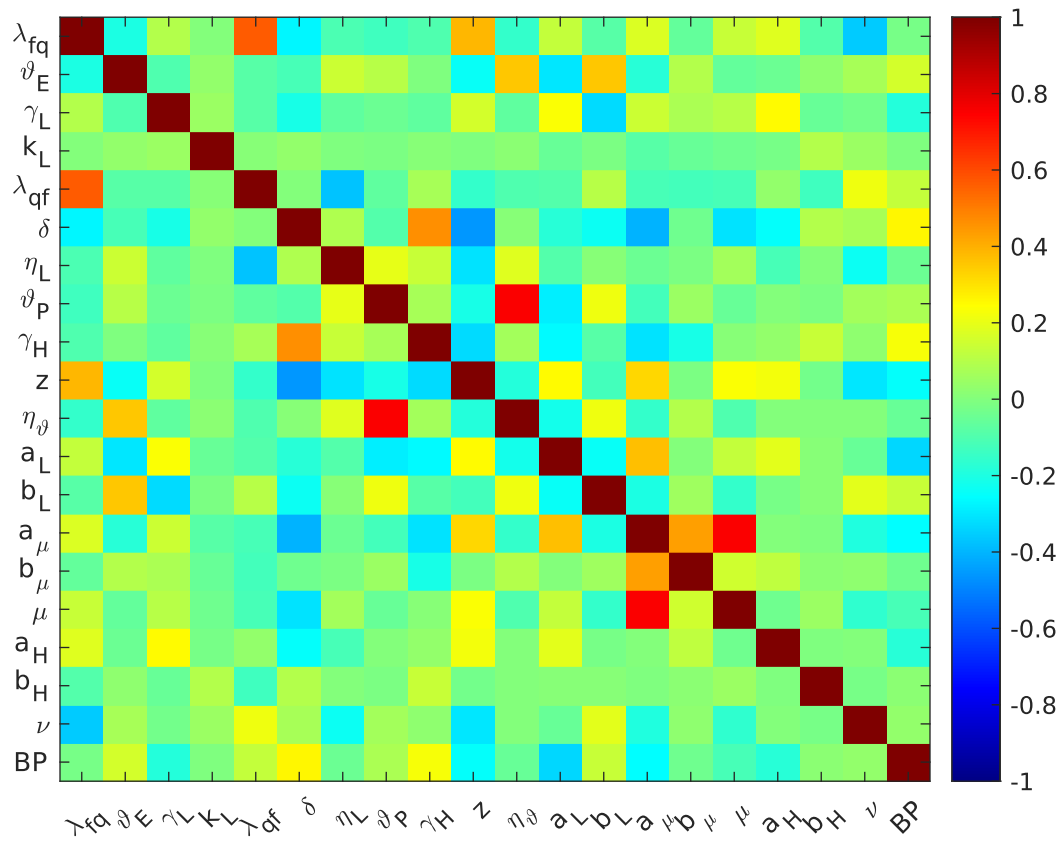
### 2.2. Estimated parameters with their intervals

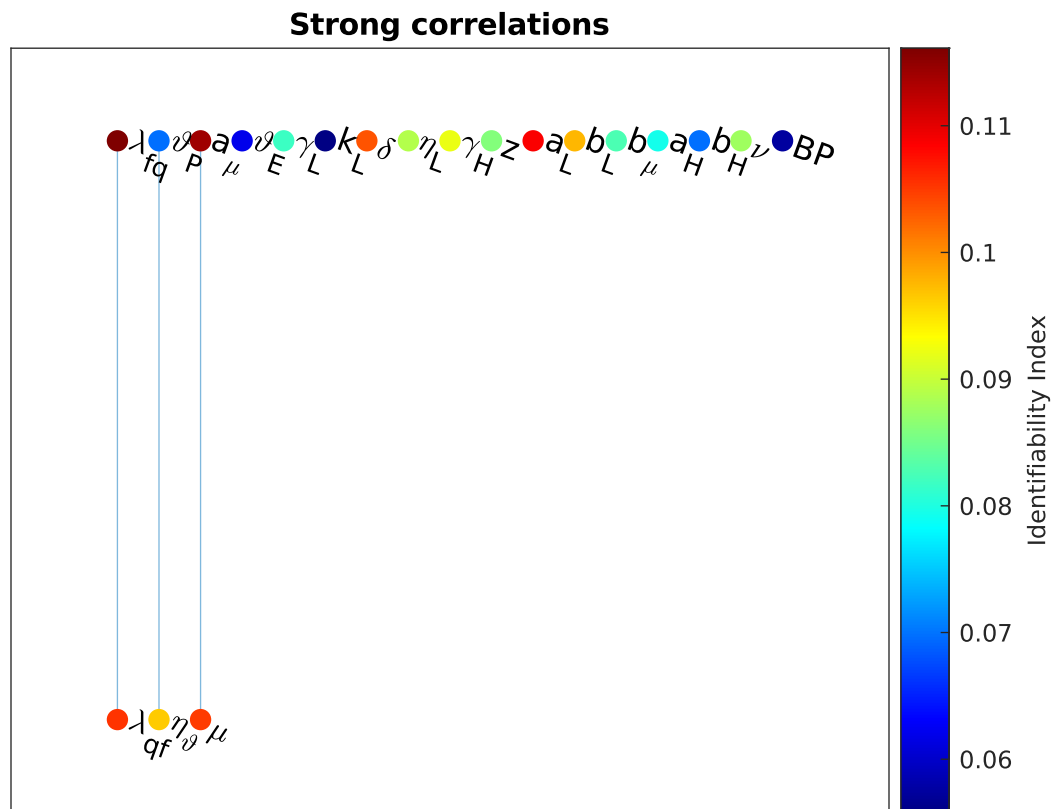
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.3685'	'0.445'	'0.4067'	'0.8445'	'0.1161'
$\vartheta_E$	'0'	'0.0076'	'0.0019'	'0.0006'	'0.0621'
$\gamma_L$	'0.0926'	'0.1478'	'0.1202'	'0.533'	'0.0818'
$k_L$	'5.3328'	'5.7557'	'5.5442'	'5.0818'	'0.0558'
$\lambda_{qf}$	'0.4202'	'0.4915'	'0.4558'	'0.1075'	'0.1053'
$\delta$	'0.0046'	'0.0148'	'0.0097'	'0.0069'	'0.1036'
$\eta_L$	'0.3287'	'0.4012'	'0.3649'	'0.9473'	'0.0889'
$\vartheta_P$	'0.0003'	'0.0012'	'0.0007'	'0.0012'	'0.0699'
$\gamma_H$	'0.3143'	'0.3834'	'0.3489'	'0.006'	'0.0922'
$z$	'3.1524'	'3.6955'	'3.424'	'8.3896'	'0.086'
$\eta_{\vartheta}$	'0.5425'	'0.5918'	'0.5671'	'0.6065'	'0.0963'
$a_L$	'9.7702'	'10.9211'	'10.3457'	'6.6132'	'0.1088'
$b_L$	'5.4926'	'6.5601'	'6.0264'	'1.255'	'0.0977'
$a_{\mu}$	'3.5807'	'4.2377'	'3.9092'	'8.4086'	'0.1141'
$b_{\mu}$	'8.1101'	'9.1409'	'8.6255'	'8.1171'	'0.0828'
$\mu$	'0.287'	'0.3524'	'0.3197'	'0.8065'	'0.1049'
$a_H$	'5.8386'	'6.7634'	'6.301'	'2.5694'	'0.0796'
$b_H$	'9.2858'	'10.2569'	'9.7713'	'9.5652'	'0.0699'
$\nu$	'283.043'	'319.5202'	'301.2816'	'0.3618'	'0.0877'
BP	'119.2866'	'119.7134'	'119.5'	'117.5'	'0.0576'

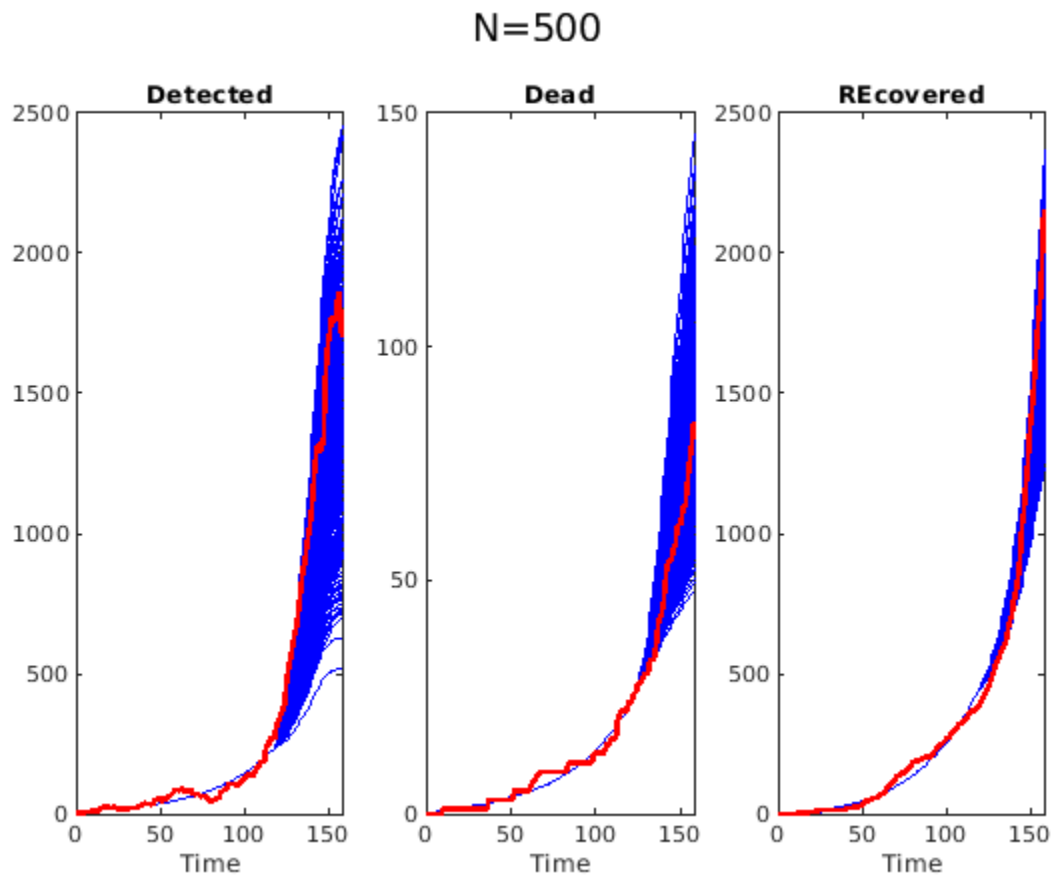
## 2.3. Identifiability analysis







## 2.4. Uncertainty analysis



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## Chapter 3. Extension number3

### 3.1. Basic information

The extension to be validated consists of the time series from the data159 to the 197. The status of the validation is: COMPLETED.

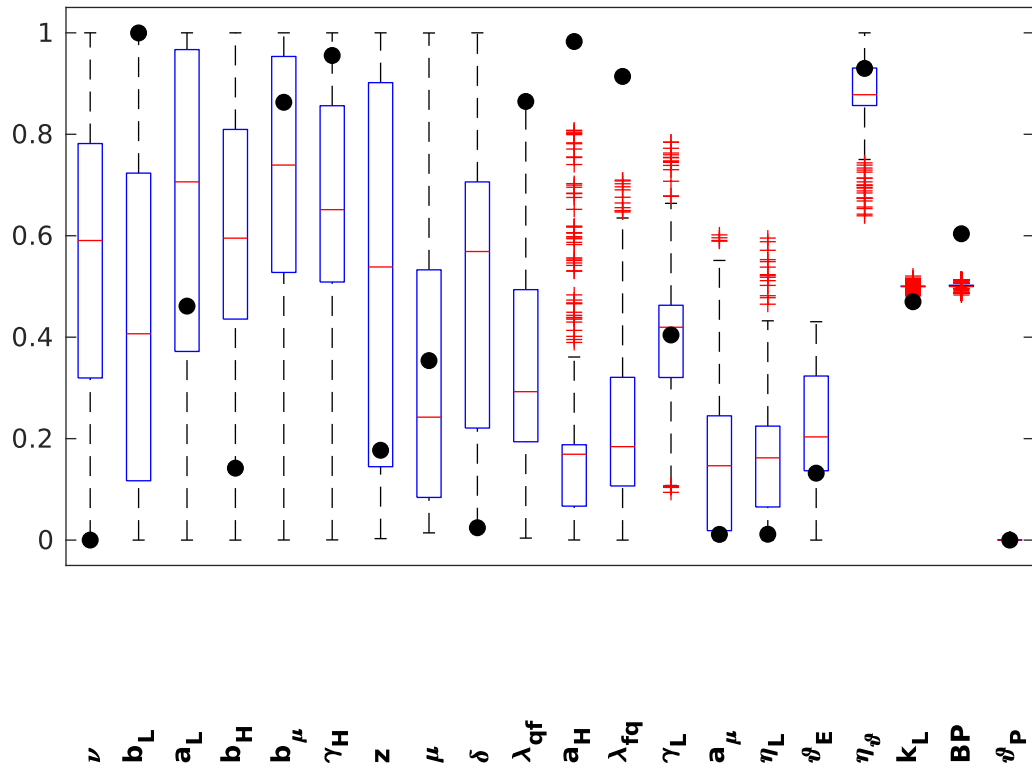
The number of estimations needed to perform the validation was1000.

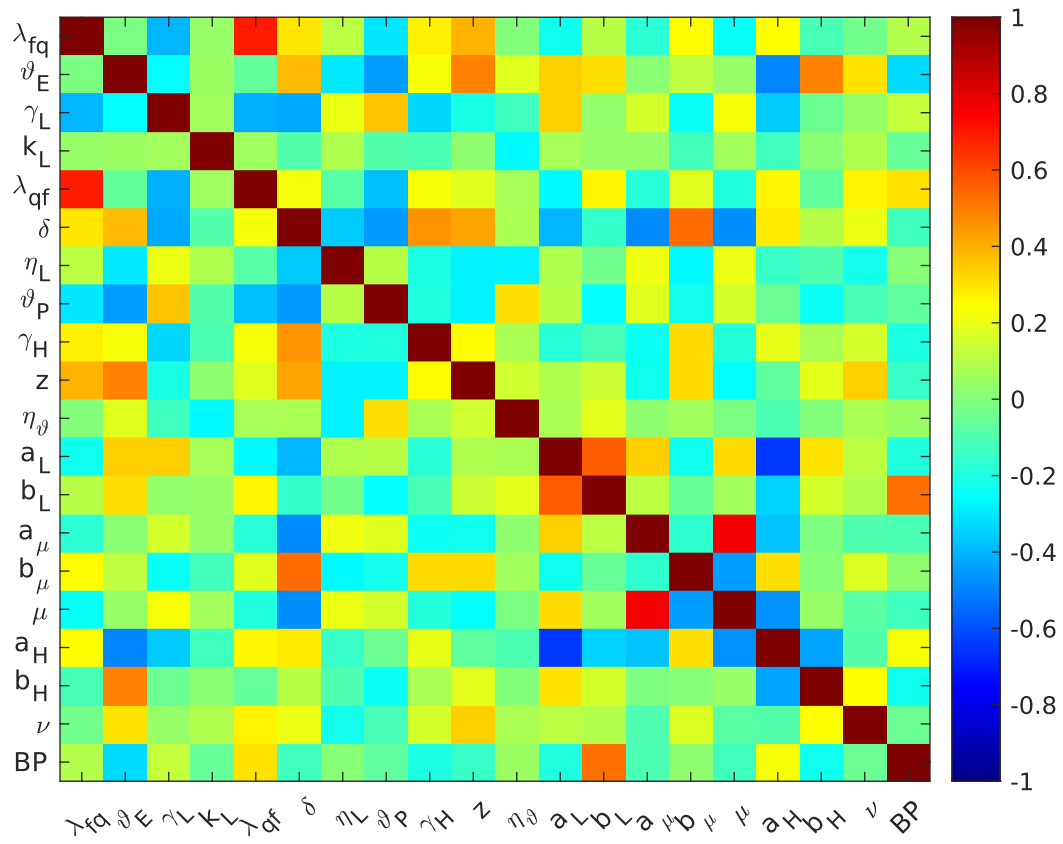
### 3.2. Estimated parameters with their intervals

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

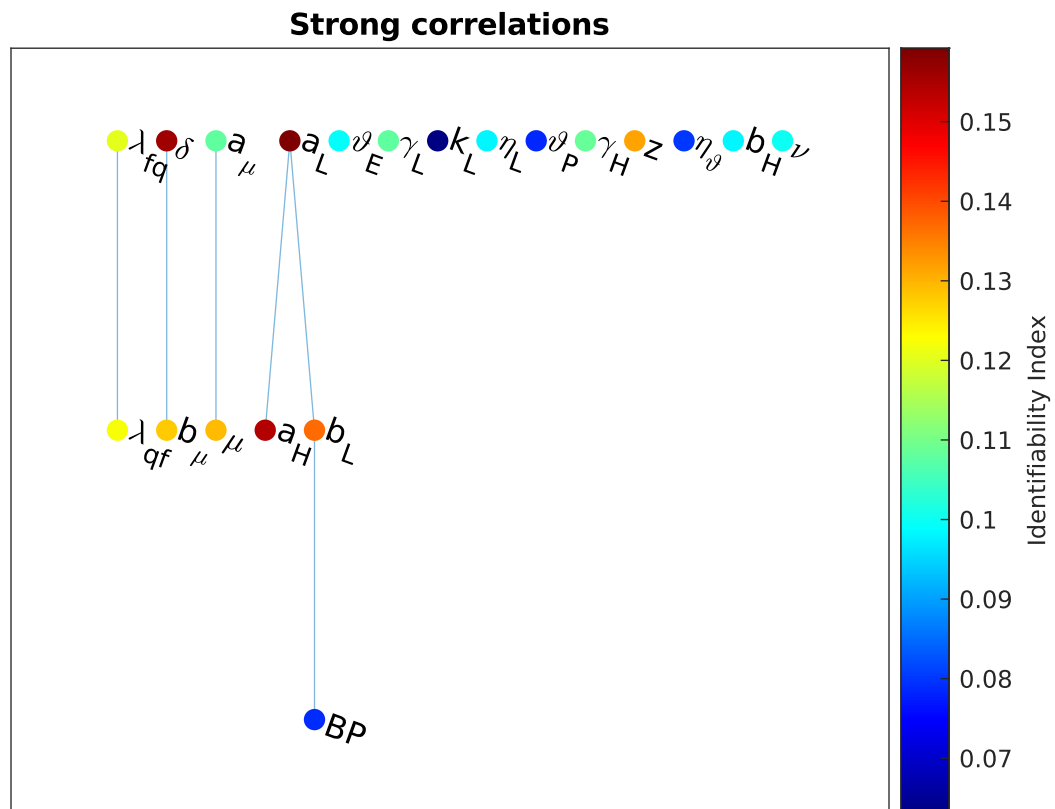
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1514'	'0.217'	'0.1842'	'0.9141'	'0.1202'
$\vartheta_E$	'0.1891'	'0.2177'	'0.2034'	'0.1319'	'0.0995'
$\gamma_L$	'0.391'	'0.4482'	'0.4196'	'0.4044'	'0.1082'
$k_L$	'5.3255'	'5.6754'	'5.5005'	'5.2293'	'0.0632'
$\lambda_{qf}$	'0.2624'	'0.3228'	'0.2926'	'0.8647'	'0.1222'
$\delta$	'0.0787'	'0.092'	'0.0853'	'0.0037'	'0.1561'
$\eta_L$	'0.1299'	'0.1944'	'0.1621'	'0.0115'	'0.0981'
$\vartheta_P$	'0'	'0.0006'	'0.0002'	'0'	'0.0788'
$\gamma_H$	'0.6175'	'0.6854'	'0.6514'	'0.9553'	'0.109'
$z$	'14.6215'	'17.6846'	'16.153'	'5.3124'	'0.1316'
$\eta_{\vartheta}$	'0.8497'	'0.9063'	'0.878'	'0.9299'	'0.0804'
$a_L$	'10.211'	'11.563'	'10.887'	'7.4581'	'0.1592'
$b_L$	'6.0984'	'7.2905'	'6.6944'	'14.9968'	'0.137'
$a_{\mu}$	'2.7451'	'3.3592'	'3.0522'	'1.1578'	'0.108'
$b_{\mu}$	'10.7906'	'11.9098'	'11.3502'	'13.083'	'0.1278'
$\mu$	'0.2045'	'0.2803'	'0.2424'	'0.3538'	'0.1296'
$a_H$	'2.648'	'4.0917'	'3.3698'	'14.7602'	'0.1541'
$b_H$	'8.8064'	'9.8595'	'9.333'	'2.9855'	'0.0984'
$\nu$	'275.1611'	'315.4285'	'295.2948'	'0.0343'	'0.1002'
BP	'158.1716'	'158.8284'	'158.5'	'166.5'	'0.079'

### 3.3. Identifiability analysis

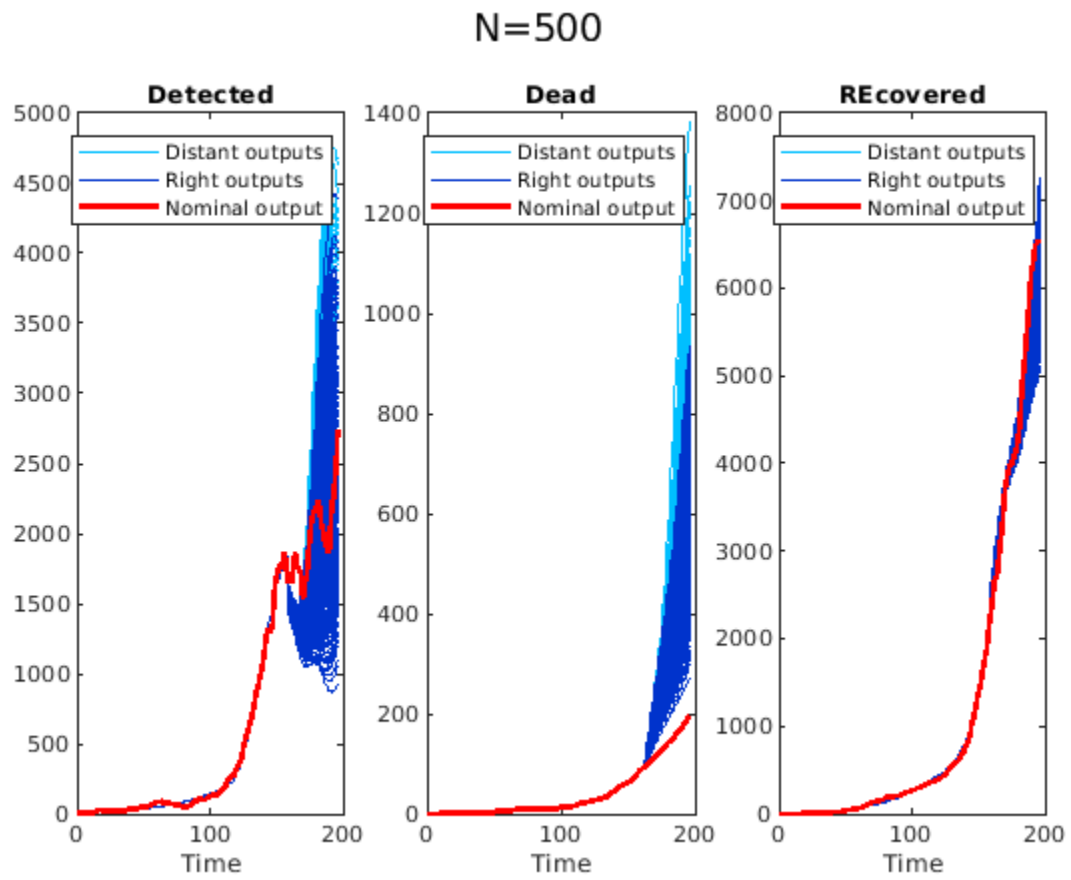








### 3.4. Uncertainty analysis



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## Chapter 4. Extension number4

### 4.1. Basic information

The extension to be validated consists of the time series from the data197 to the 223. The status of the validation is: COMPLETED.

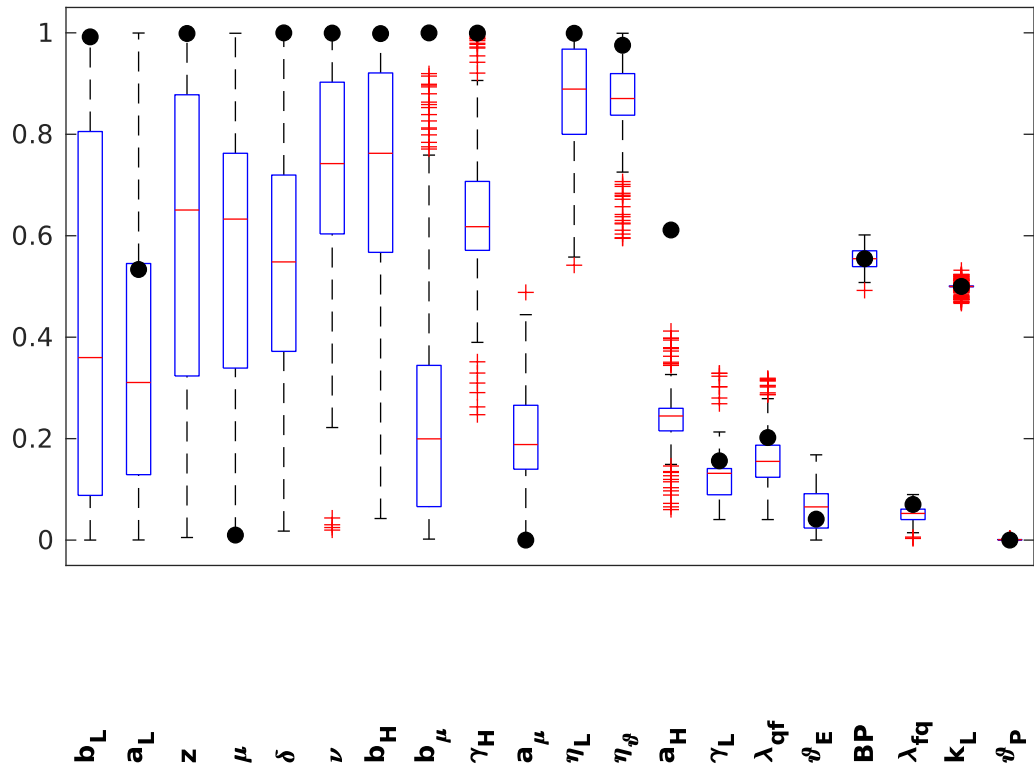
The number of estimations needed to perform the validation was1000.

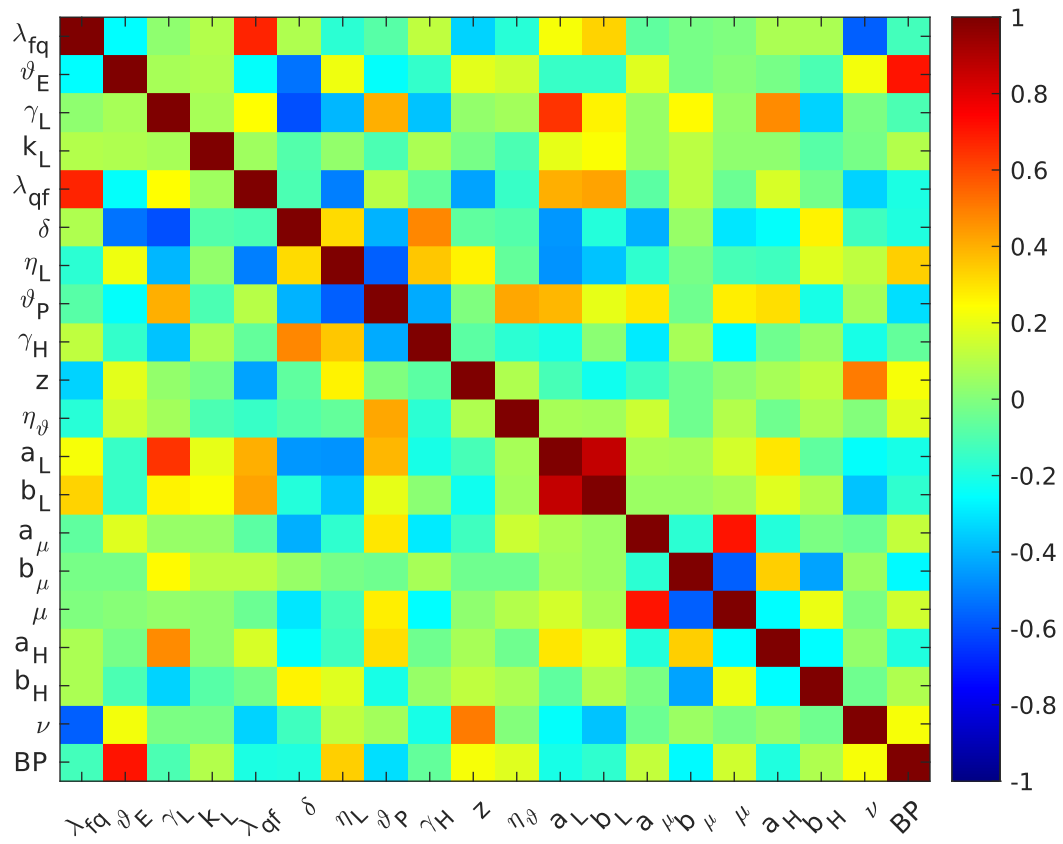
### 4.2. Estimated parameters with their intervals

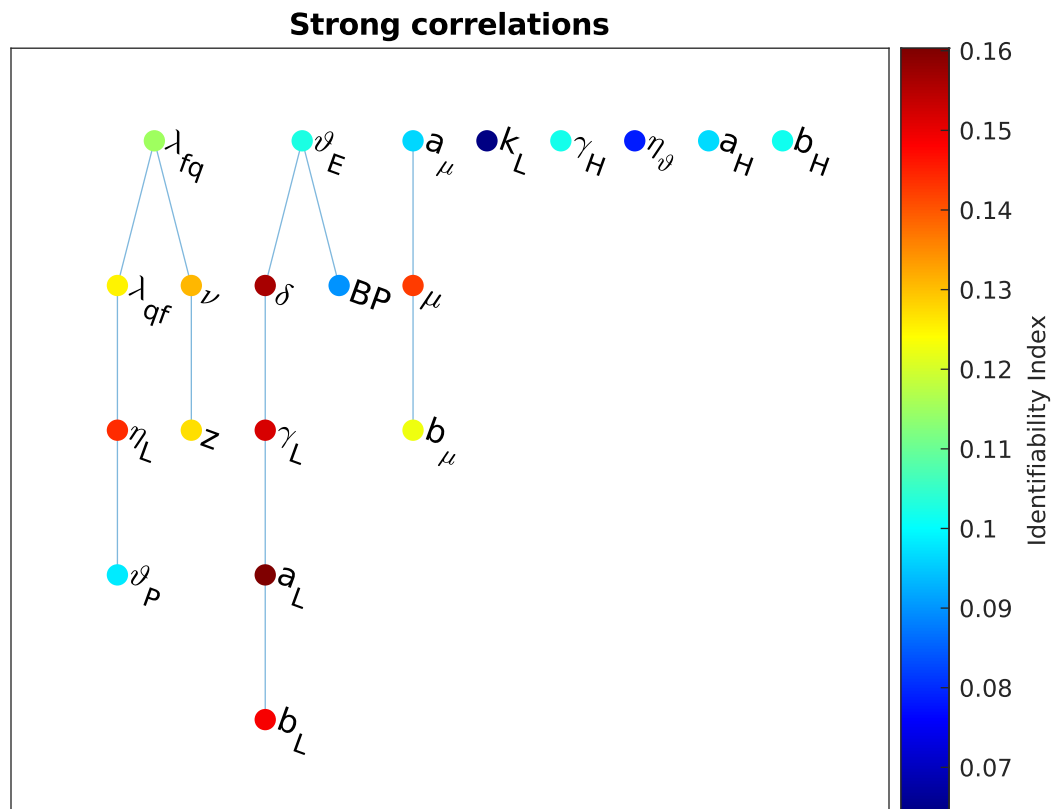
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0317'	'0.0734'	'0.0526'	'0.0702'	'0.1152'
$\vartheta_E$	'0.059'	'0.0719'	'0.0655'	'0.0413'	'0.1029'
$\gamma_L$	'0.0853'	'0.178'	'0.1316'	'0.1563'	'0.1521'
$k_L$	'5.3263'	'5.6738'	'5.5001'	'5.5001'	'0.0644'
$\lambda_{qf}$	'0.1345'	'0.1758'	'0.1552'	'0.2021'	'0.1254'
$\delta$	'0.0756'	'0.0889'	'0.0823'	'0.15'	'0.1565'
$\eta_L$	'0.8548'	'0.9233'	'0.8891'	'0.9991'	'0.1441'
$\vartheta_P$	'0.0005'	'0.001'	'0.0007'	'0'	'0.0981'
$\gamma_H$	'0.5841'	'0.6515'	'0.6178'	'0.9994'	'0.1021'
$z$	'17.9388'	'21.1032'	'19.521'	'29.9611'	'0.1273'
$\eta_{\vartheta}$	'0.8442'	'0.8967'	'0.8705'	'0.9755'	'0.0786'
$a_L$	'4.7359'	'5.9634'	'5.3497'	'8.4681'	'0.1603'
$b_L$	'5.2287'	'6.8461'	'6.0374'	'14.8886'	'0.149'
$a_{\mu}$	'3.3723'	'3.9018'	'3.6371'	'1.0002'	'0.0965'
$b_{\mu}$	'3.0767'	'4.5117'	'3.7942'	'14.9975'	'0.1226'
$\mu$	'0.582'	'0.6836'	'0.6328'	'0.0099'	'0.1424'
$a_H$	'3.9981'	'4.8525'	'4.4253'	'9.5583'	'0.0968'
$b_H$	'11.082'	'12.2681'	'11.6751'	'14.9788'	'0.1015'
$\nu$	'350.7166'	'391.484'	'371.1003'	'499.7474'	'0.131'
BP	'194.319'	'194.681'	'194.5'	'194.5'	'0.09'

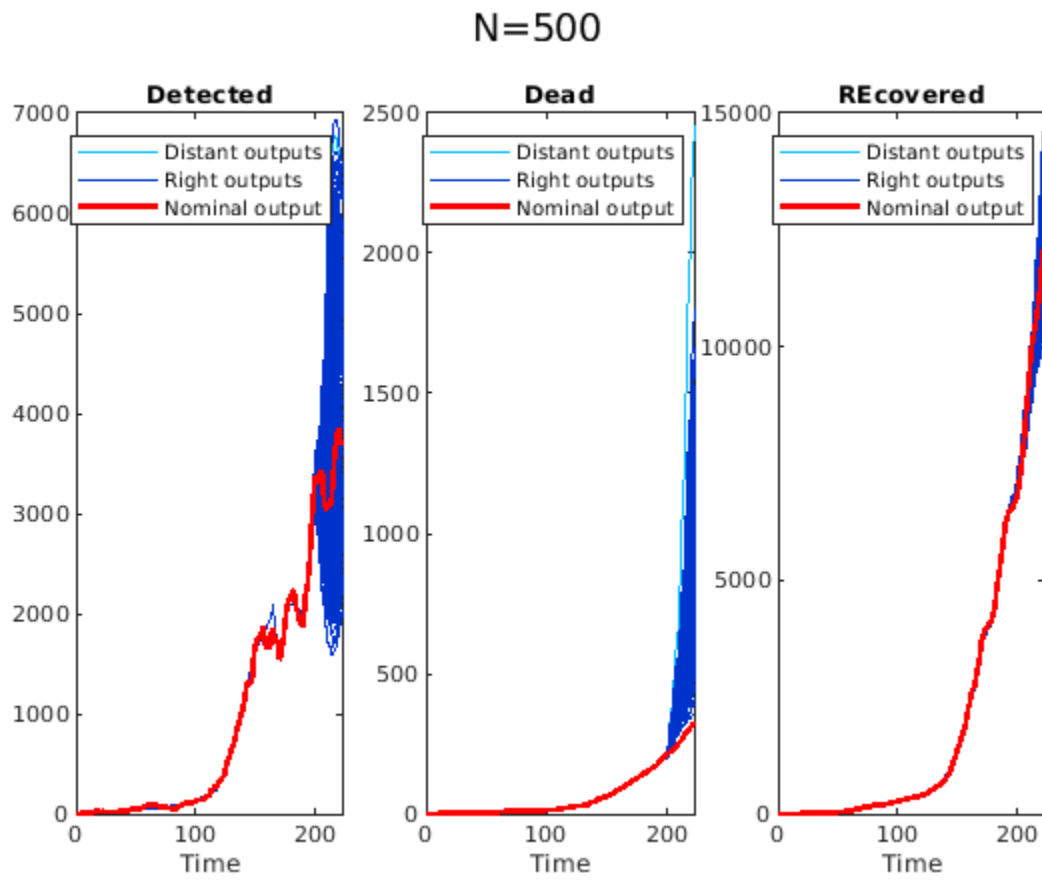
### 4.3. Identifiability analysis







#### 4.4. Uncertainty analysys



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## Chapter 5. Extension number5

### 5.1. Basic information

The extension to be validated consists of the time series from the data223 to the 259. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

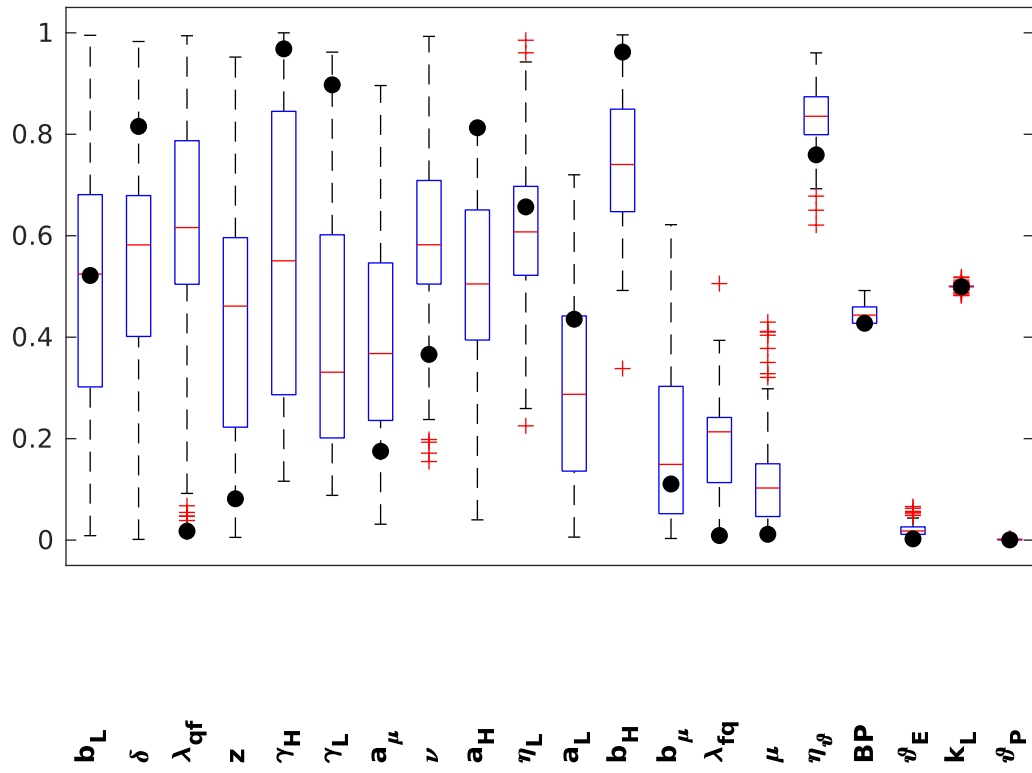
### 5.2. Estimated parameters with their intervals

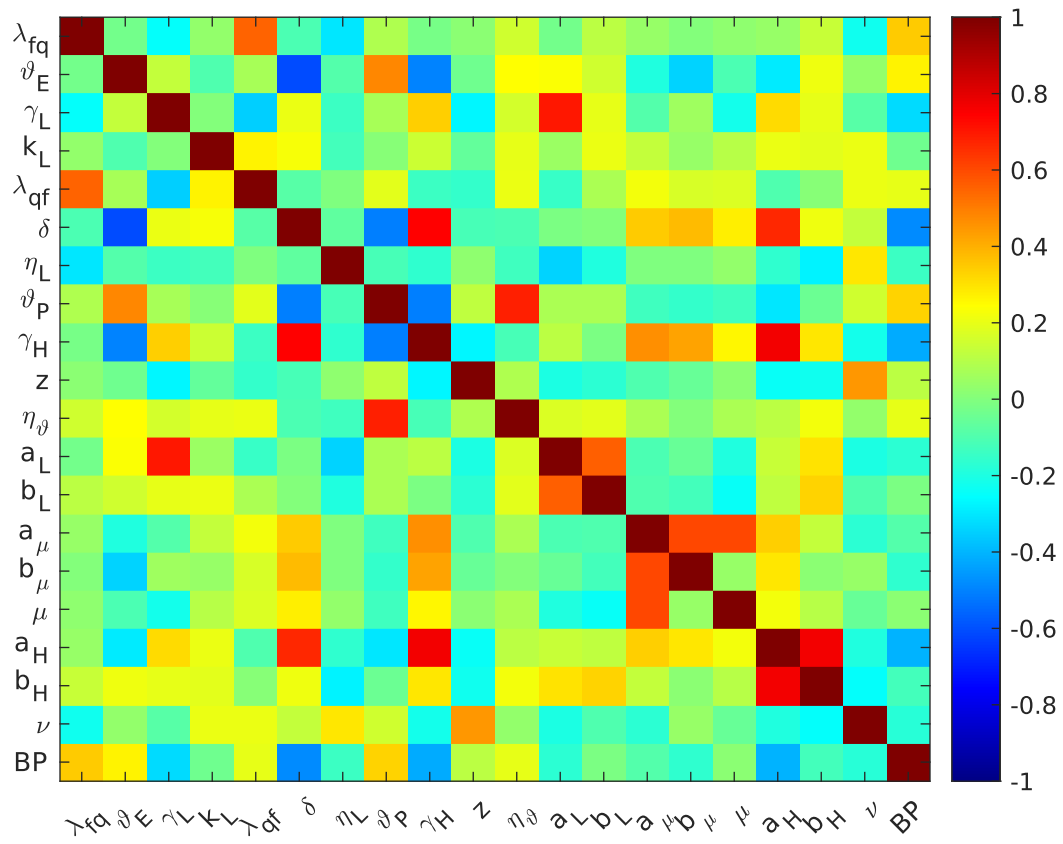
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

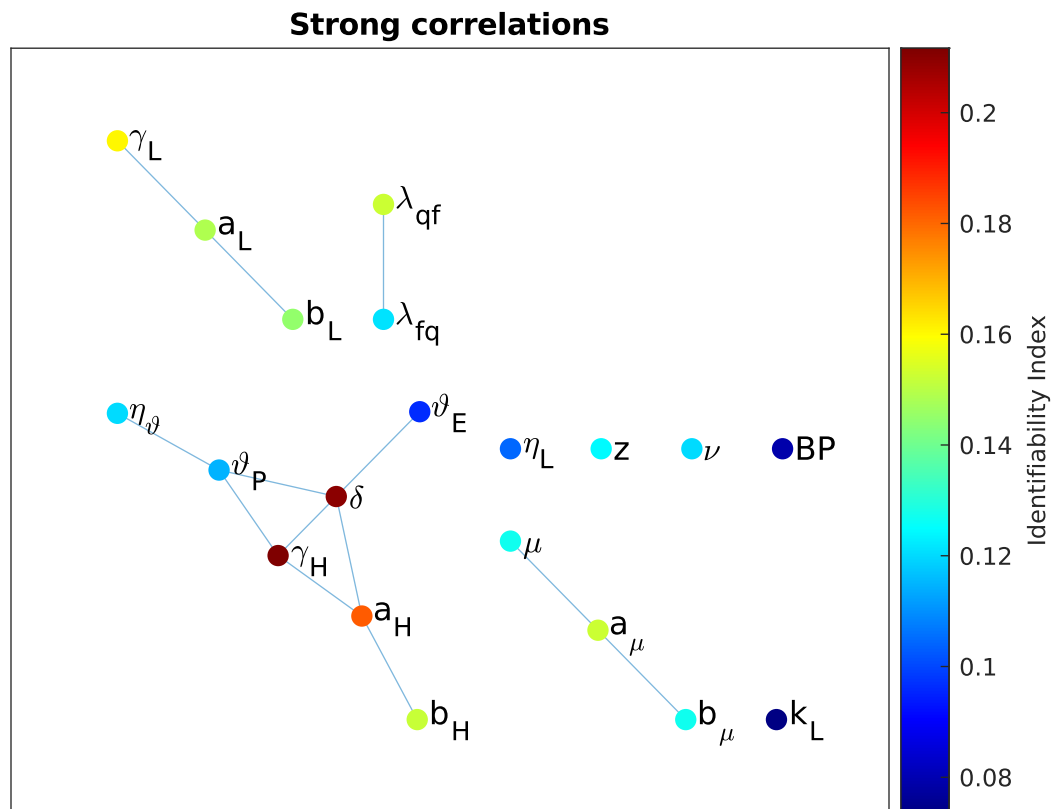
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1612'	'0.2657'	'0.2134'	'0.009'	'0.1212'
$\vartheta_E$	'0.0101'	'0.0258'	'0.018'	'0.0025'	'0.0969'
$\gamma_L$	'0.2588'	'0.4031'	'0.3309'	'0.8975'	'0.1607'
$k_L$	'5.3259'	'5.6736'	'5.4998'	'5.4955'	'0.0737'
$\lambda_{qf}$	'0.5424'	'0.6897'	'0.6161'	'0.0176'	'0.1525'
$\delta$	'0.0769'	'0.0977'	'0.0873'	'0.1223'	'0.21'
$\eta_L$	'0.5602'	'0.6549'	'0.6076'	'0.6568'	'0.1048'
$\vartheta_P$	'0.0009'	'0.0013'	'0.0011'	'0.0004'	'0.1149'
$\gamma_H$	'0.4751'	'0.6259'	'0.5505'	'0.9684'	'0.2116'
$z$	'11.8735'	'15.8055'	'13.8395'	'2.4443'	'0.1244'
$\eta_{\vartheta}$	'0.7928'	'0.8782'	'0.8355'	'0.7595'	'0.1202'
$a_L$	'4.3052'	'5.7419'	'5.0236'	'7.0961'	'0.1486'
$b_L$	'7.3591'	'9.3246'	'8.3419'	'8.3034'	'0.145'
$a_{\mu}$	'5.4025'	'6.8934'	'6.148'	'3.4516'	'0.1526'
$b_{\mu}$	'2.3542'	'3.8244'	'3.0893'	'2.5489'	'0.127'
$\mu$	'0.0489'	'0.1564'	'0.1027'	'0.0115'	'0.1275'
$a_H$	'7.3969'	'8.7412'	'8.0691'	'12.3799'	'0.1816'
$b_H$	'10.4693'	'12.262'	'11.3657'	'14.4689'	'0.1519'
$\nu$	'263.4793'	'318.7577'	'291.1185'	'183.0537'	'0.1201'
BP	'224.2454'	'224.7546'	'224.5'	'223.4997'	'0.0793'



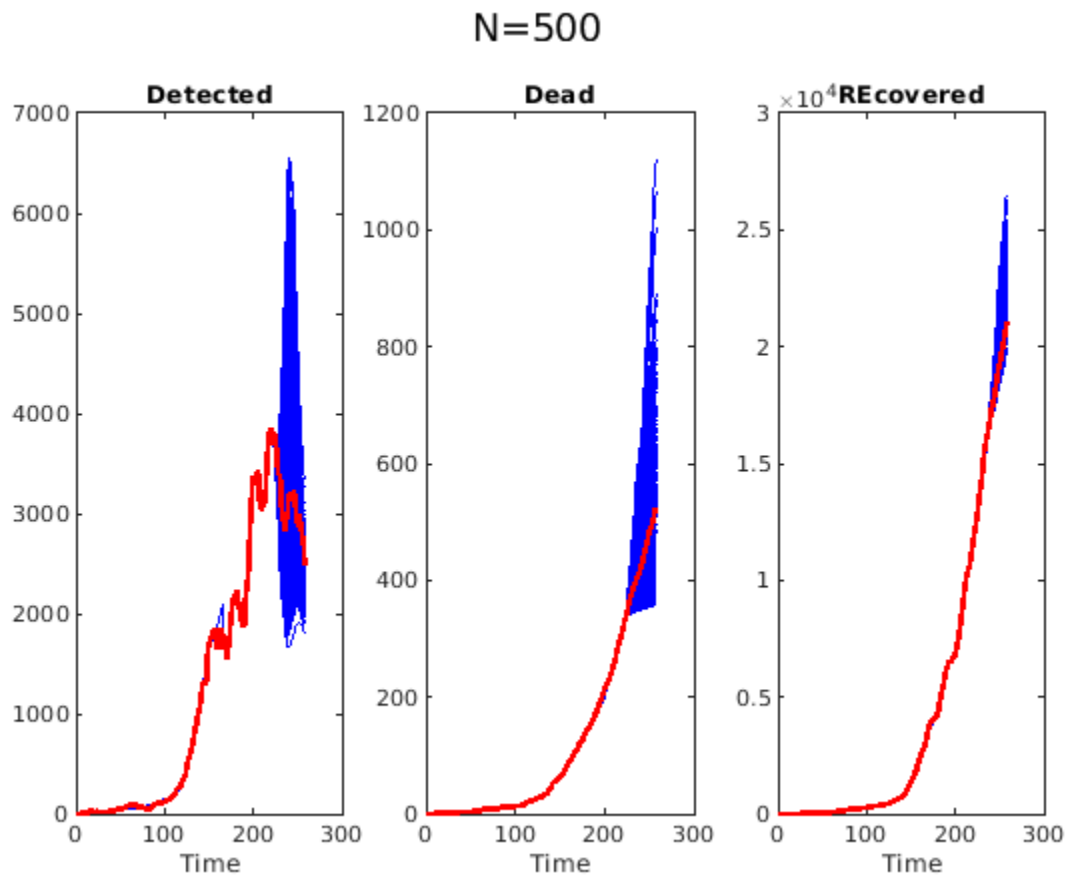
### 5.3. Identifiability analysys







## 5.4. Uncertainty analysis



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## Chapter 6. Extension number6

### 6.1. Basic information

The extension to be validated consists of the time series from the data259 to the 288. The status of the validation is: COMPLETED.

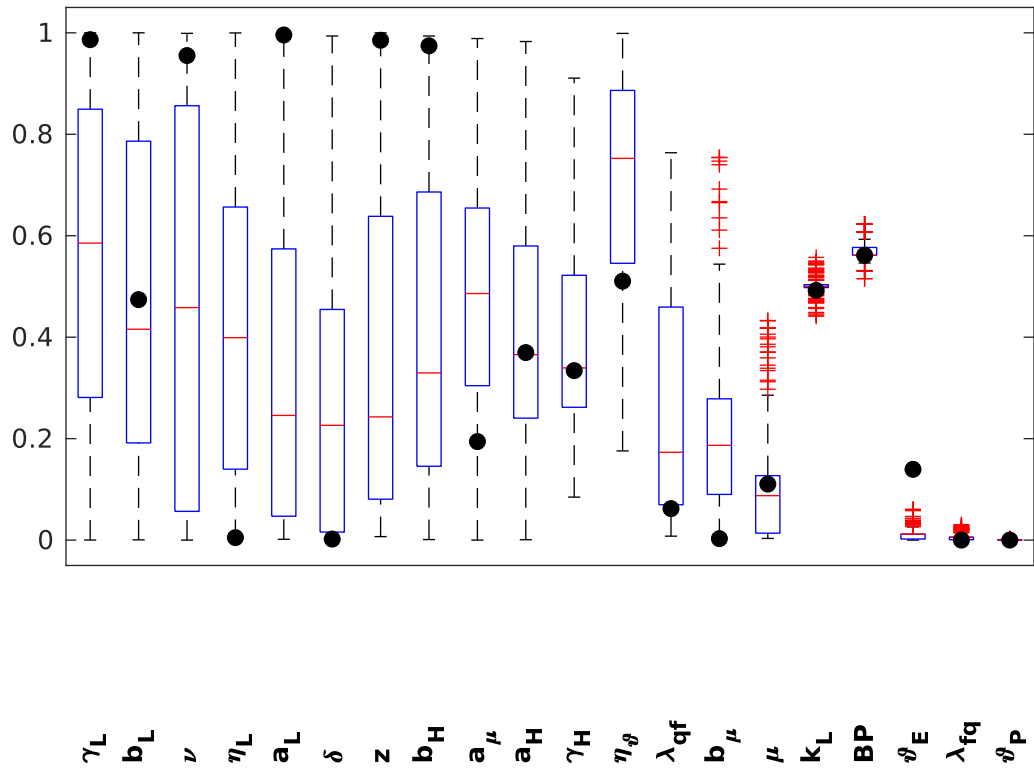
The number of estimations needed to perform the validation was1000.

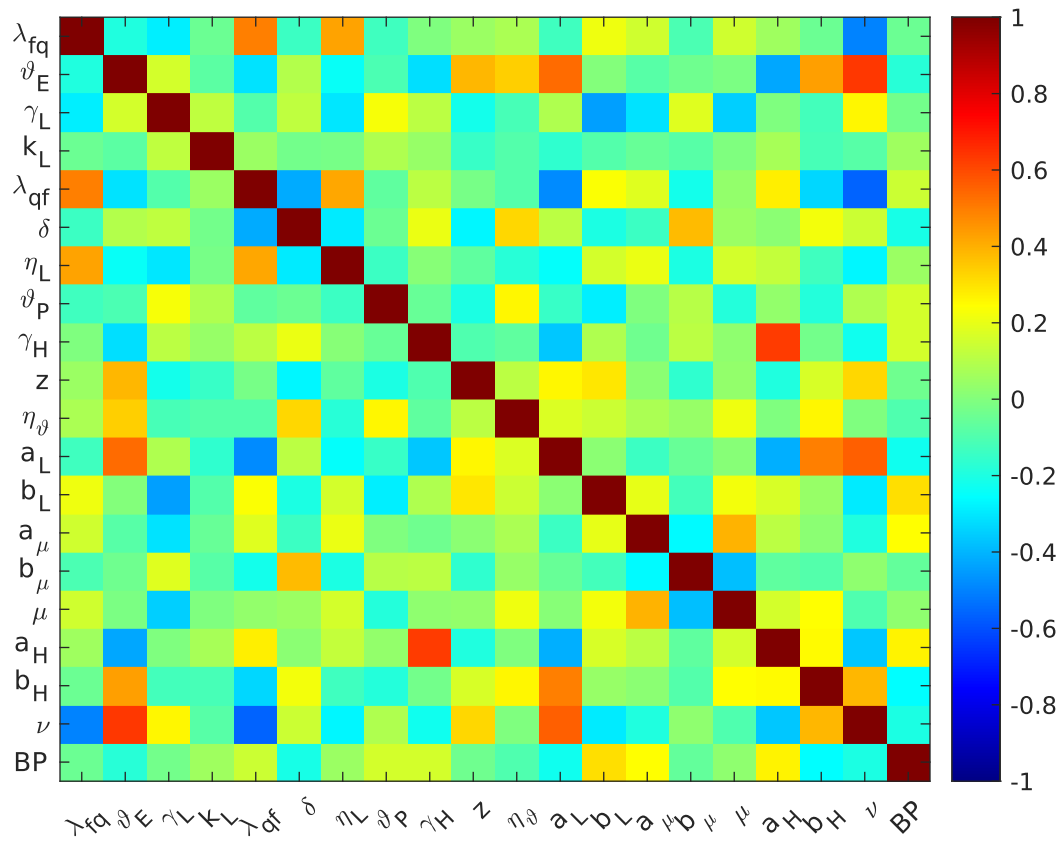
### 6.2. Estimated parameters with their intervals

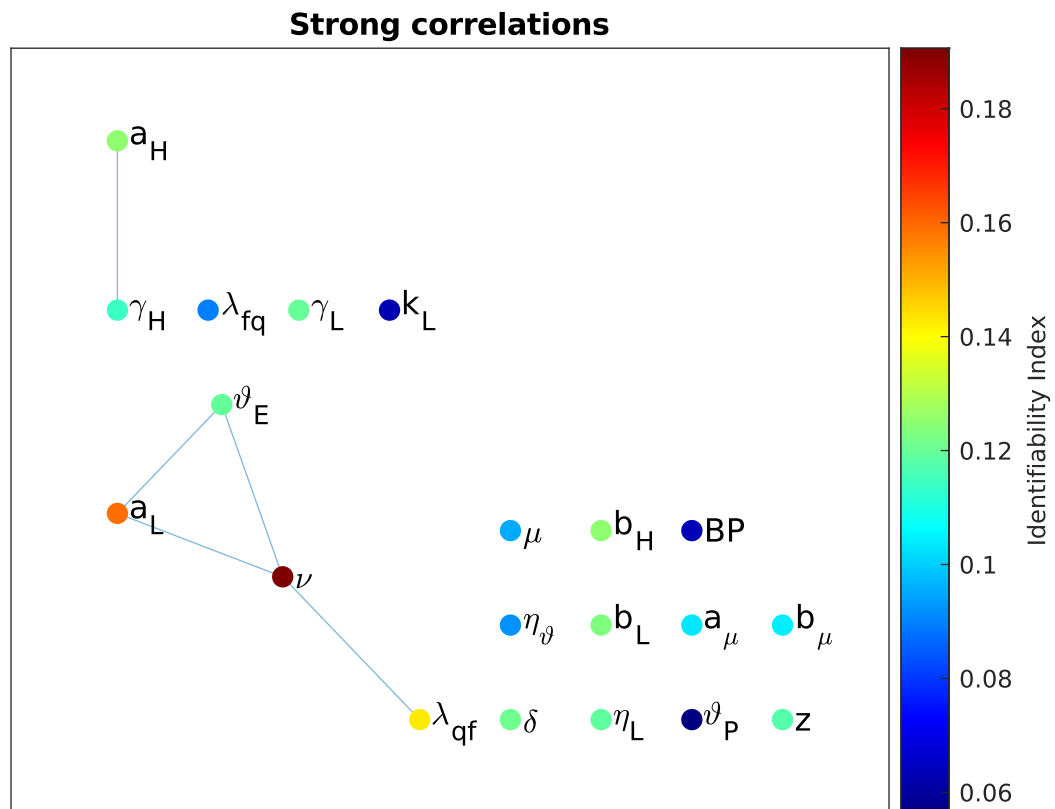
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.049'	'0.0058'	'0'	'0.0898'
$\vartheta_E$	'0'	'0.0253'	'0.0118'	'0.1395'	'0.1196'
$\gamma_L$	'0.5348'	'0.6363'	'0.5855'	'0.9865'	'0.12'
$k_L$	'5.3178'	'5.6866'	'5.5022'	'5.4312'	'0.0633'
$\lambda_{qf}$	'0.1248'	'0.2223'	'0.1735'	'0.0621'	'0.1428'
$\delta$	'0.0259'	'0.0419'	'0.0339'	'0.0003'	'0.121'
$\eta_L$	'0.3506'	'0.4476'	'0.3991'	'0.0049'	'0.1189'
$\vartheta_P$	'0.0002'	'0.0008'	'0.0005'	'0.0001'	'0.0565'
$\gamma_H$	'0.2972'	'0.3835'	'0.3404'	'0.334'	'0.1143'
$z$	'5.6531'	'8.9179'	'7.2855'	'29.5603'	'0.1175'
$\eta_{\vartheta}$	'0.719'	'0.7861'	'0.7525'	'0.5105'	'0.0922'
$a_L$	'3.7178'	'5.1649'	'4.4414'	'14.9406'	'0.1591'
$b_L$	'6.0655'	'7.5736'	'6.8196'	'7.6371'	'0.1232'
$a_{\mu}$	'7.1971'	'8.4123'	'7.8047'	'3.7198'	'0.1036'
$b_{\mu}$	'2.9796'	'4.2701'	'3.6248'	'1.0403'	'0.1046'
$\mu$	'0.0524'	'0.1242'	'0.0883'	'0.1104'	'0.0954'
$a_H$	'5.5284'	'6.7074'	'6.1179'	'6.1753'	'0.1253'
$b_H$	'4.8763'	'6.3501'	'5.6132'	'14.6424'	'0.1257'
$\nu$	'197.7048'	'260.6031'	'229.154'	'477.5829'	'0.1906'
BP	'259.2359'	'259.7641'	'259.5'	'259.4999'	'0.0634'

### 6.3. Identifiability analysis

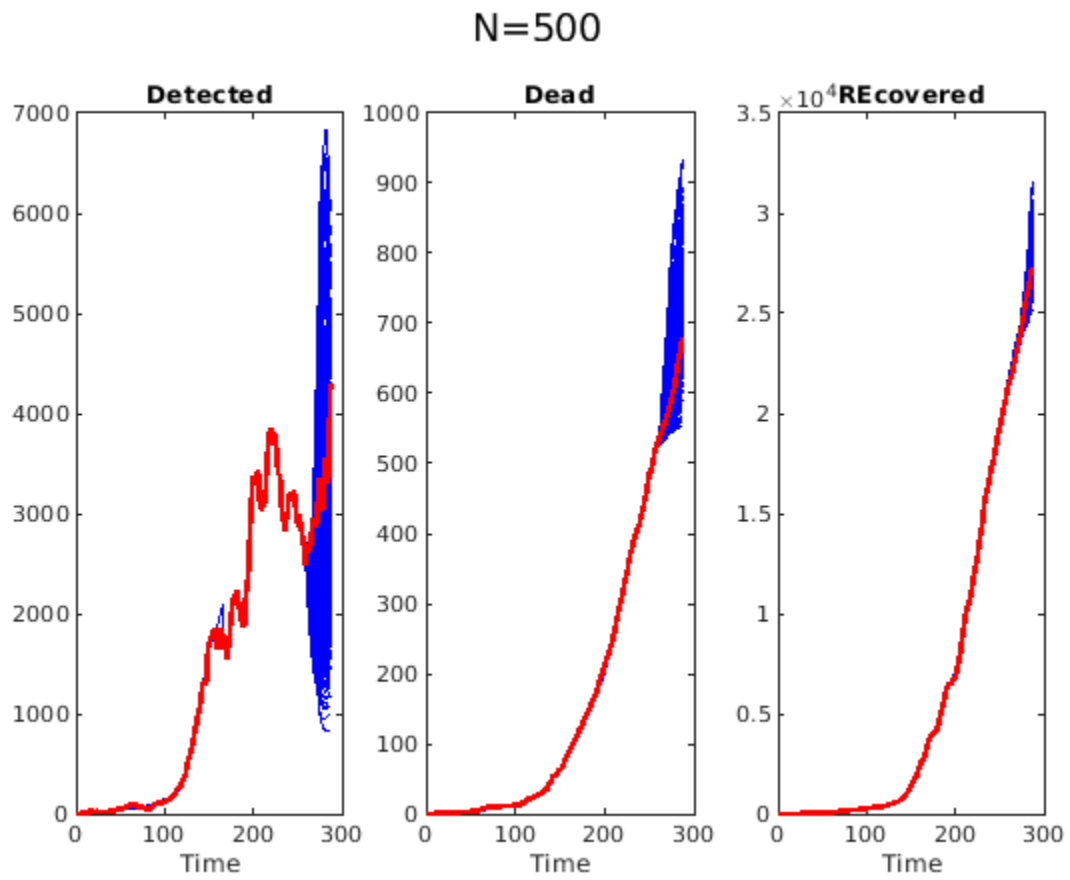








## 6.4. Uncertainty analysis



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## Chapter 7. Extension number7

### 7.1. Basic information

The extension to be validated consists of the time series from the data288 to the 322. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

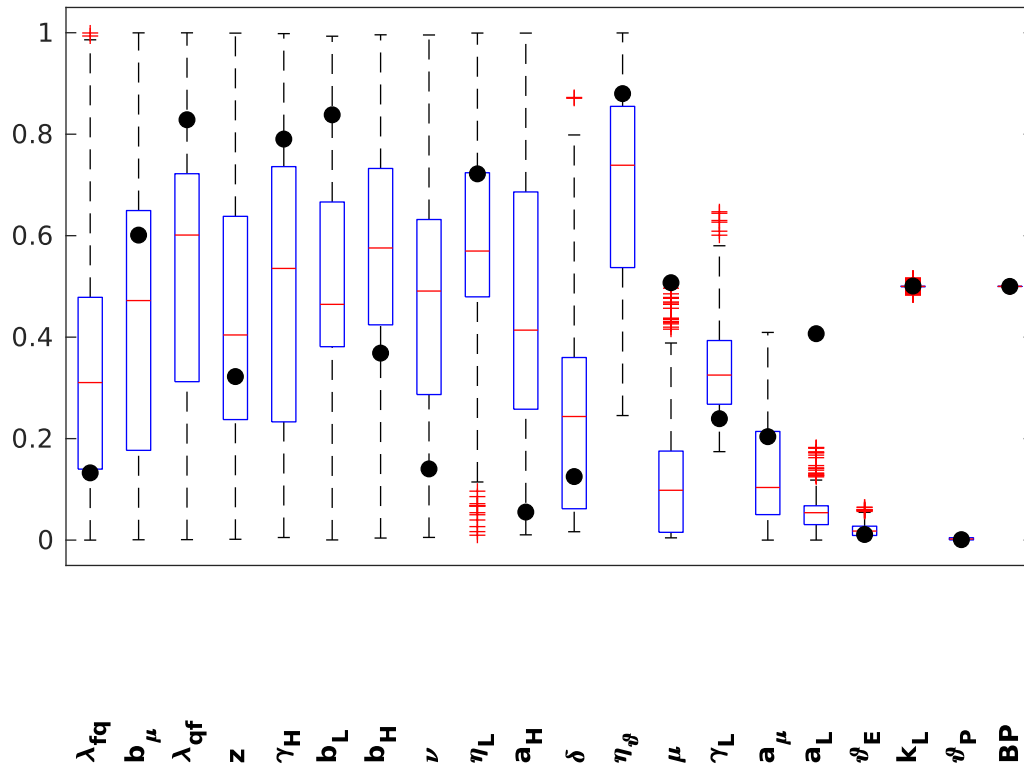
### 7.2. Estimated parameters with their intervals

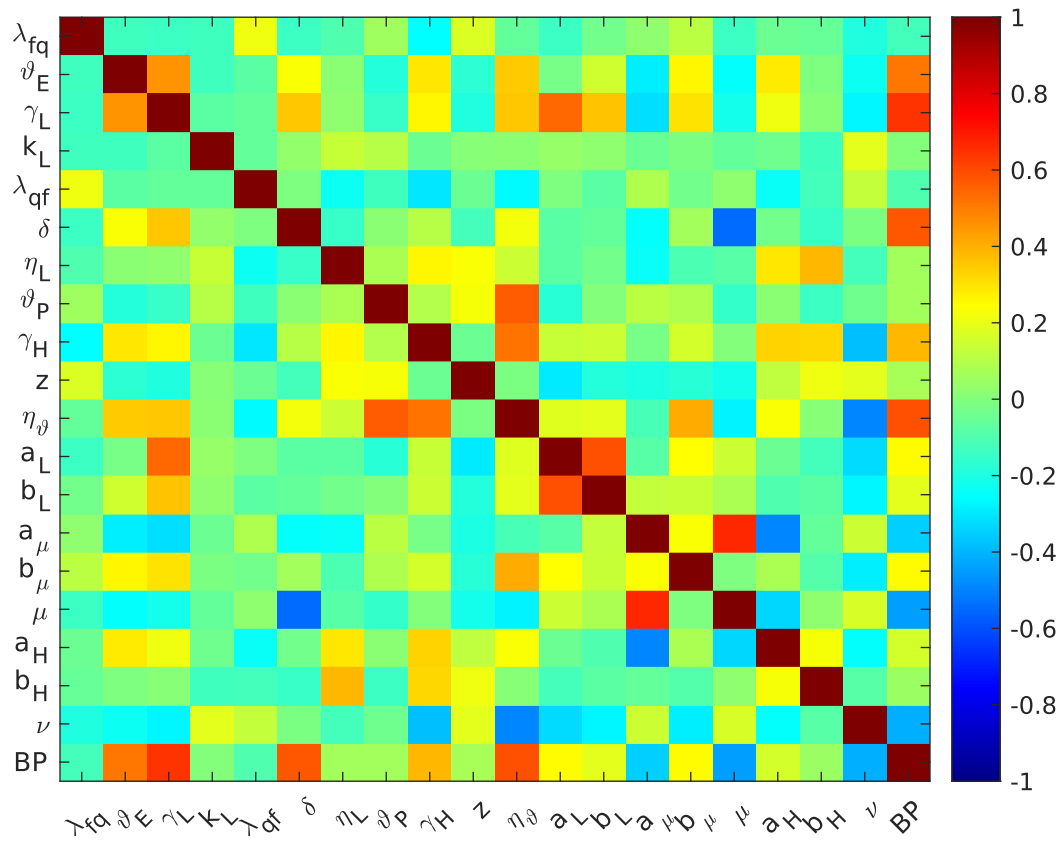
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

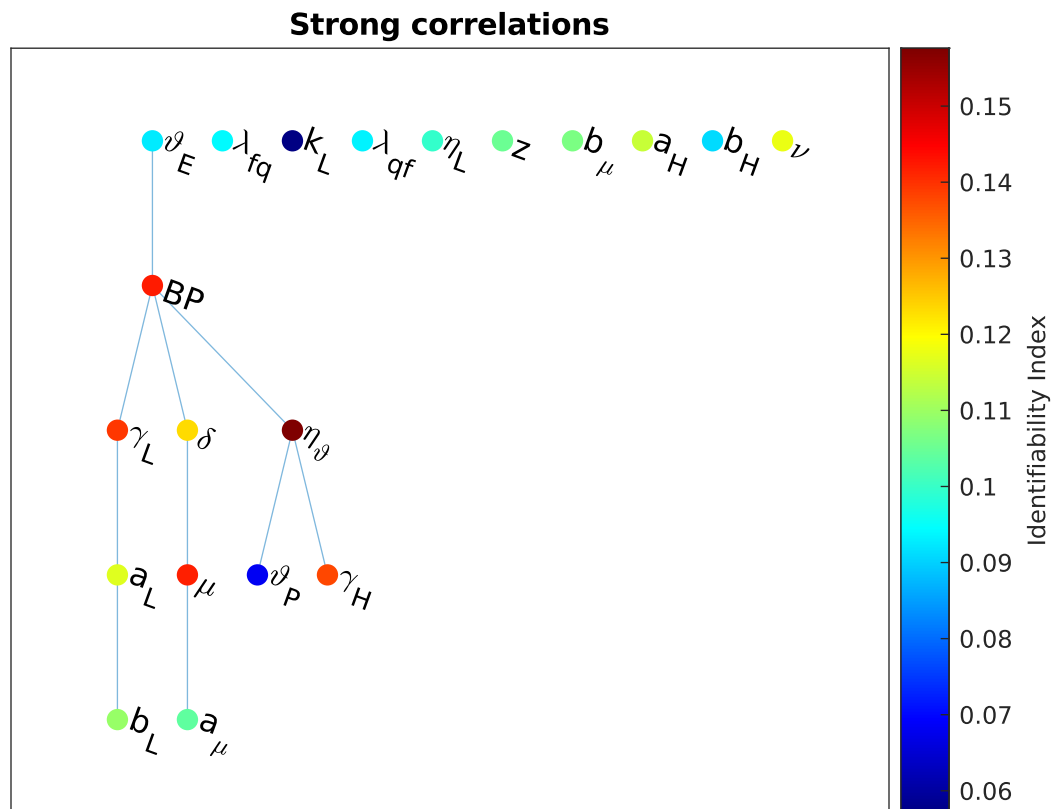
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0299'	'0.1426'	'0.3105'	'0.1325'	'0.0944'
$\vartheta_E$	'0.008'	'0.0233'	'0.0178'	'0.0111'	'0.0925'
$\gamma_L$	'0.1655'	'0.2544'	'0.3253'	'0.2393'	'0.1395'
$k_L$	'2.0445'	'8.2561'	'5.4999'	'5.5067'	'0.0572'
$\lambda_{qf}$	'0.295'	'0.9136'	'0.6012'	'0.8285'	'0.0936'
$\delta$	'0.0029'	'0.033'	'0.0365'	'0.0188'	'0.1232'
$\eta_L$	'0.1131'	'0.7897'	'0.5697'	'0.7219'	'0.0997'
$\vartheta_P$	'0.0005'	'0.0016'	'0.0022'	'0.0009'	'0.0682'
$\gamma_H$	'0.4392'	'0.9035'	'0.5354'	'0.7904'	'0.1379'
$z$	'6.5178'	'18.7208'	'12.1294'	'9.6691'	'0.1051'
$\eta_{\vartheta}$	'0.8226'	'0.9775'	'0.7388'	'0.88'	'0.1576'
$a_L$	'2.003'	'8.0216'	'1.7561'	'6.6955'	'0.1164'
$b_L$	'9.1239'	'14.4783'	'7.505'	'12.7355'	'0.1096'
$a_{\mu}$	'3.8459'	'12.0342'	'2.452'	'3.8539'	'0.1039'
$b_{\mu}$	'1.8574'	'13.0015'	'7.6095'	'9.4159'	'0.1069'
$\mu$	'0'	'0.95'	'0.0982'	'0.5073'	'0.1416'
$a_H$	'1.072'	'2.4398'	'6.7937'	'1.774'	'0.1143'
$b_H$	'2.26'	'13.1464'	'9.0606'	'6.1599'	'0.0913'
$\nu$	'68.6236'	'139.4814'	'245.432'	'70.1558'	'0.1178'
BP	'288.5866'	'291.5497'	'290.5'	'290.4998'	'0.1422'

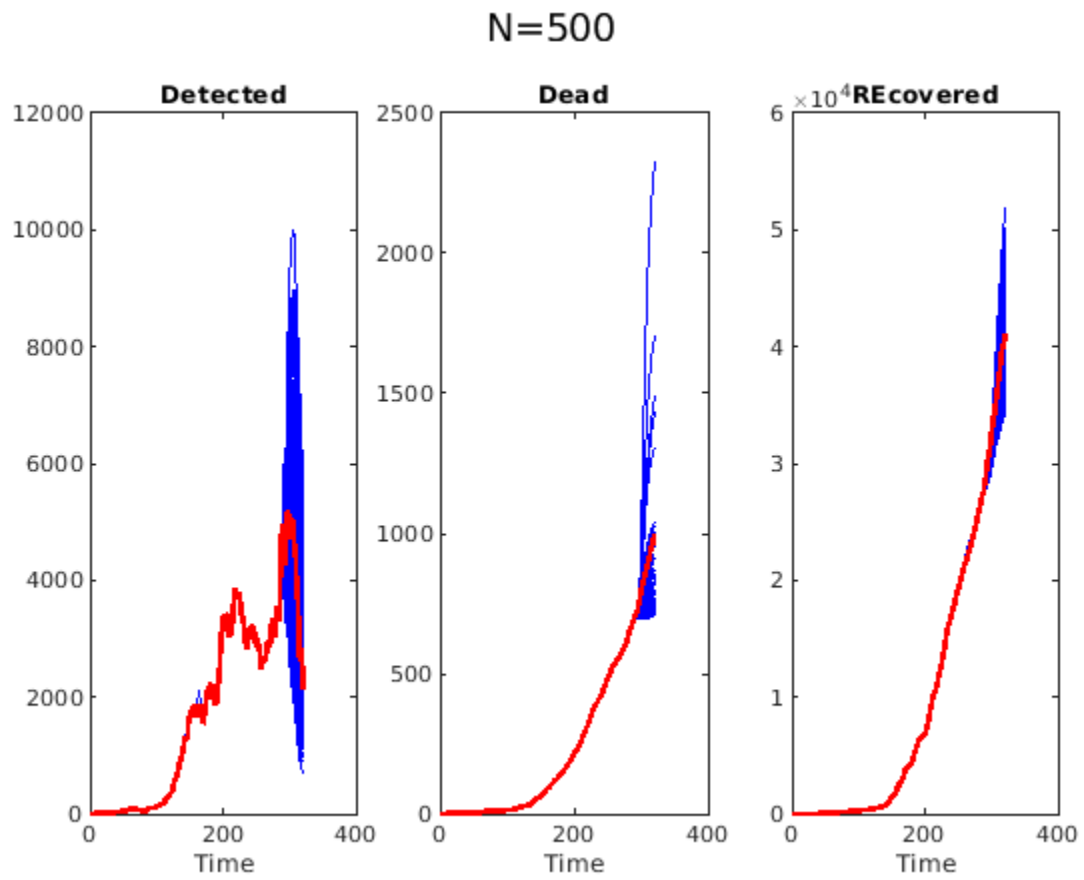
### 7.3. Identifiability analysis







## 7.4. Uncertainty analysis



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## Chapter 8. Extension number8

### 8.1. Basic information

The extension to be validated consists of the time series from the data322 to the 342. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

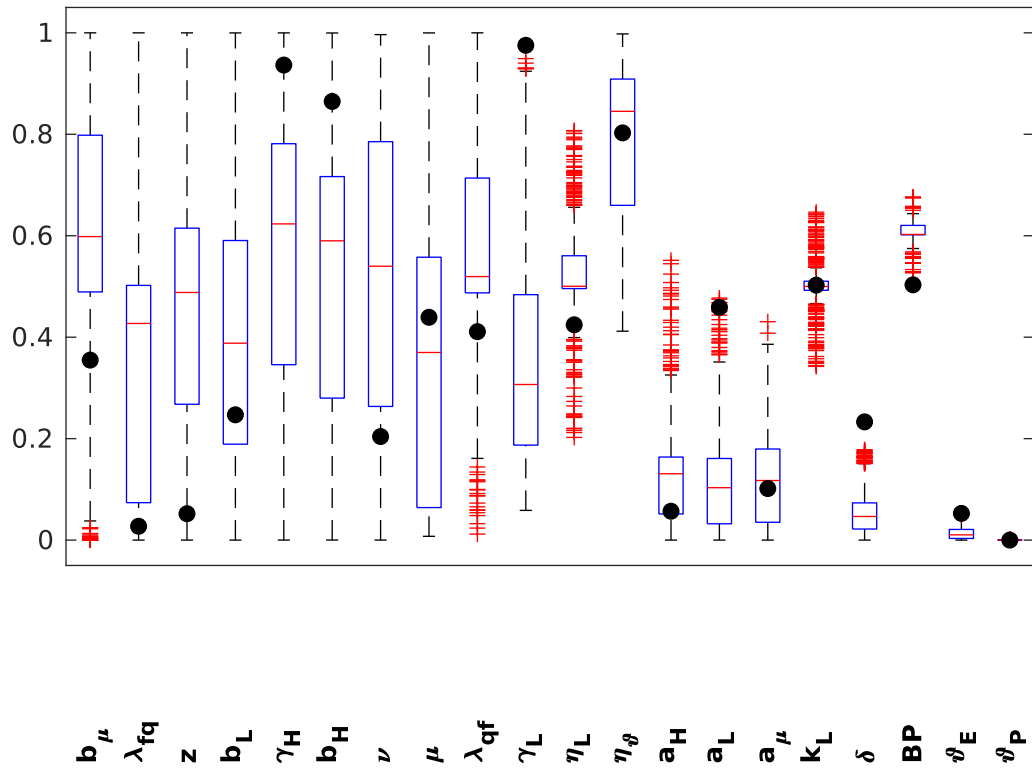
### 8.2. Estimated parameters with their intervals

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

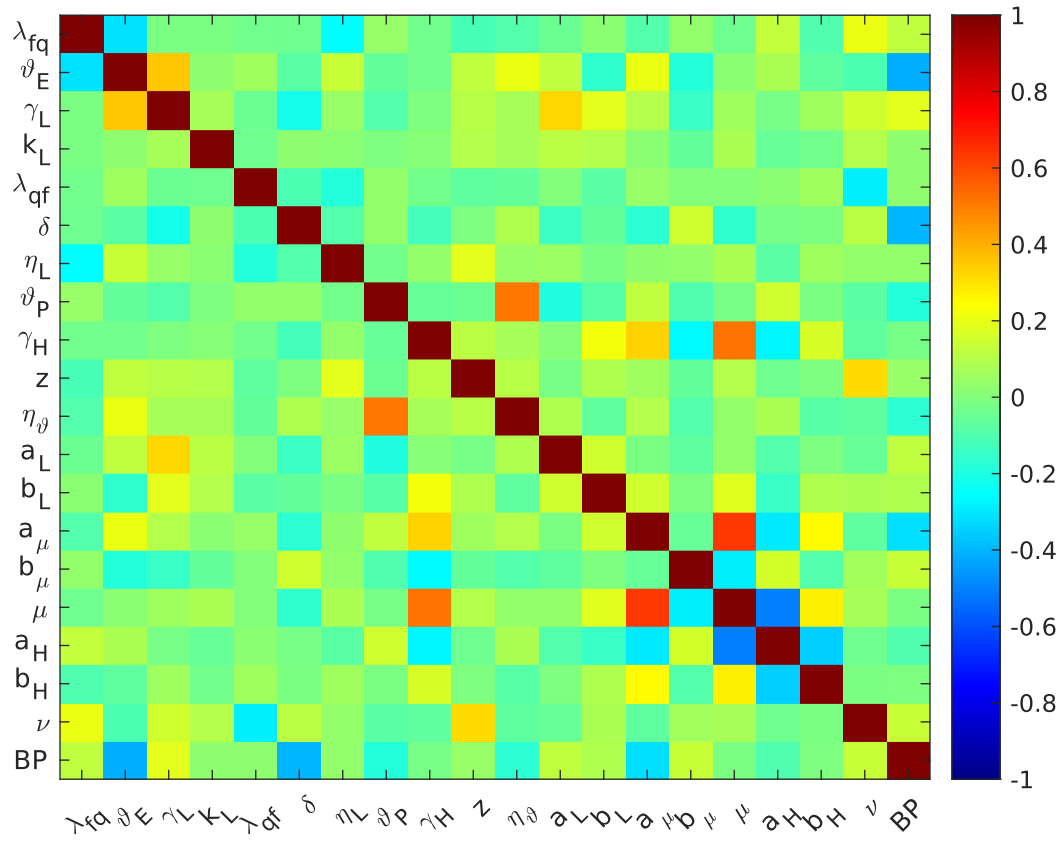
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

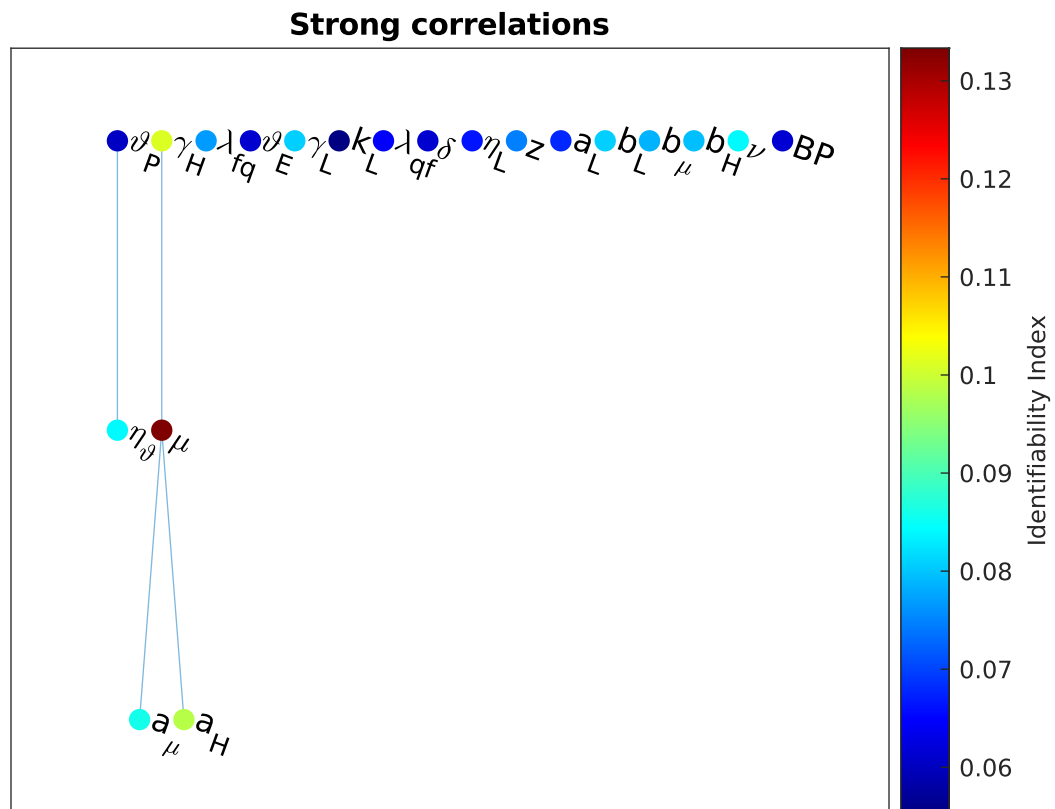
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.003'	'0.9003'	'0.4271'	'0.0273'	'0.0769'
$\vartheta_E$	'0.0436'	'0.0683'	'0.0104'	'0.0526'	'0.0613'
$\gamma_L$	'0.4192'	'1'	'0.3071'	'0.9754'	'0.081'
$k_L$	'1'	'10'	'5.5001'	'5.5232'	'0.0554'
$\lambda_{qf}$	'0'	'0.9246'	'0.5195'	'0.4109'	'0.0646'
$\delta$	'0'	'0.044'	'0.007'	'0.035'	'0.0613'
$\eta_L$	'0'	'0.955'	'0.5004'	'0.4244'	'0.0665'
$\vartheta_P$	'0'	'0.0001'	'0.0001'	'0'	'0.0603'
$\gamma_H$	'0.2681'	'1'	'0.6233'	'0.9365'	'0.1013'
$z$	'0.0878'	'3.5101'	'14.6447'	'1.5601'	'0.0748'
$\eta_{\vartheta}$	'0.6807'	'0.96'	'0.8451'	'0.8028'	'0.0841'
$a_L$	'6.9741'	'9.6372'	'2.4465'	'7.423'	'0.0681'
$b_L$	'4.2714'	'7.3498'	'6.4343'	'4.4577'	'0.0808'
$a_{\mu}$	'2.2466'	'6.6542'	'2.6463'	'2.4227'	'0.086'
$b_{\mu}$	'1'	'15'	'9.3766'	'5.9676'	'0.0787'
$\mu$	'0'	'0.9389'	'0.3699'	'0.4392'	'0.1333'
$a_H$	'1'	'3.3688'	'2.8312'	'1.7967'	'0.0985'
$b_H$	'2.6177'	'15'	'9.2594'	'13.106'	'0.0796'
$\nu$	'68.7663'	'500'	'269.9478'	'102.0651'	'0.0842'
BP	'314.5246'	'317.75'	'320.5318'	'315.1744'	'0.0617'

## 8.3. Identifiability analysis

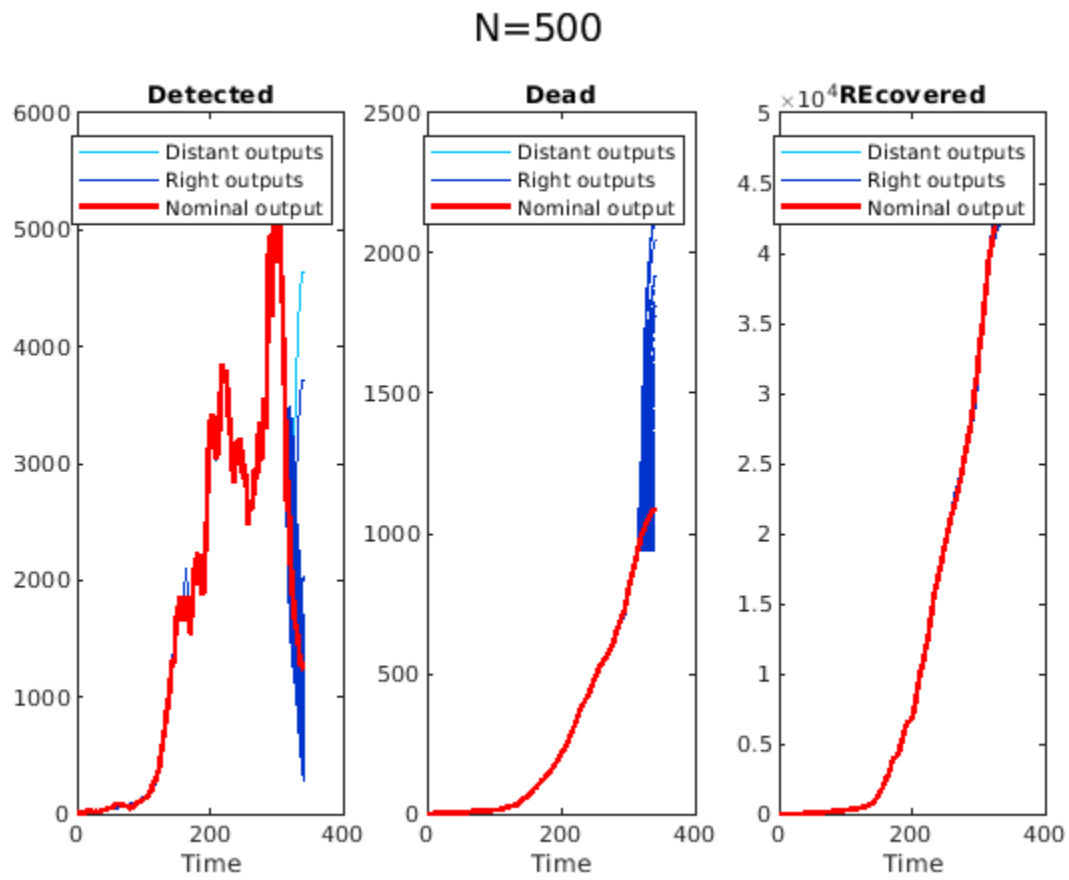








## 8.4. Uncertainty analysis



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## Chapter 9. Extension number9

### 9.1. Basic information

The extension to be validated consists of the time series from the data342 to the 374. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

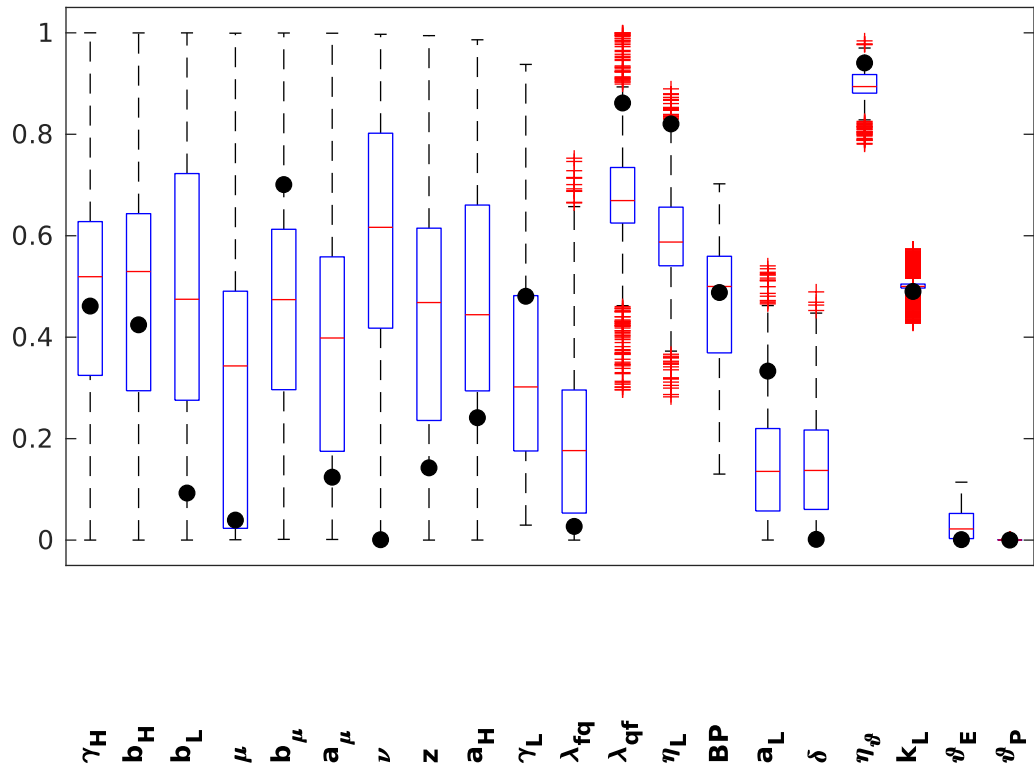
### 9.2. Estimated parameters with their intervals

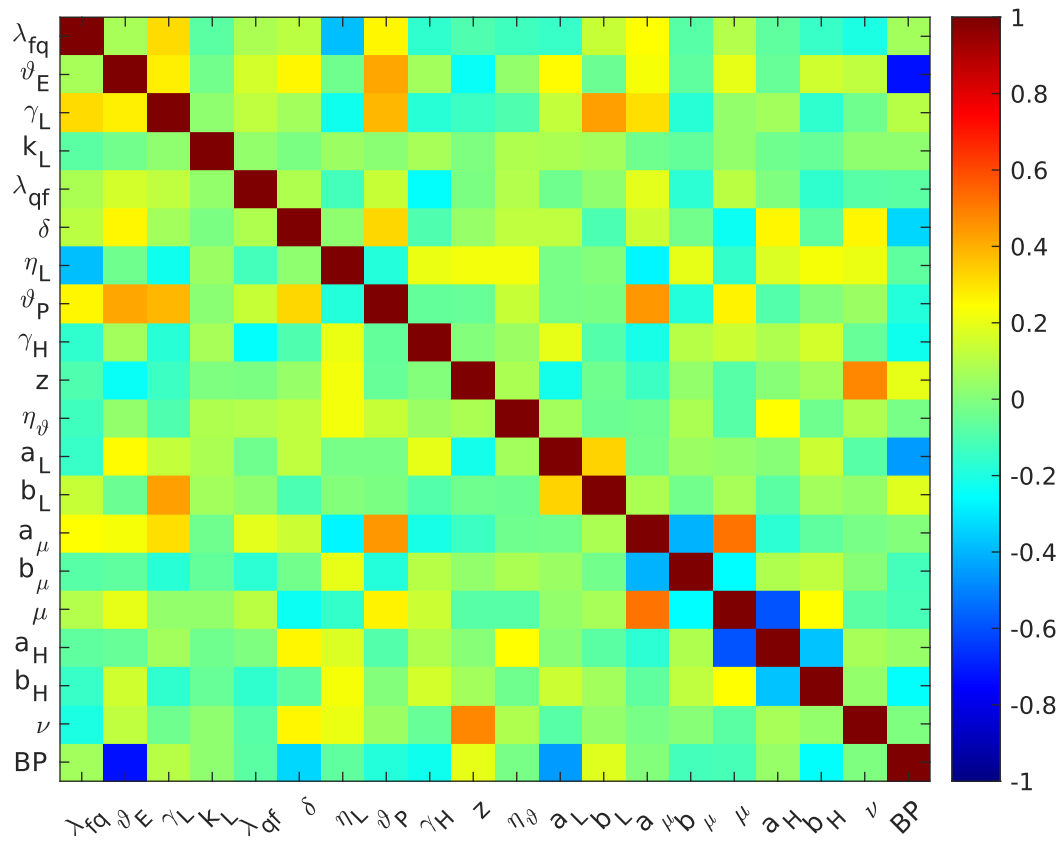
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

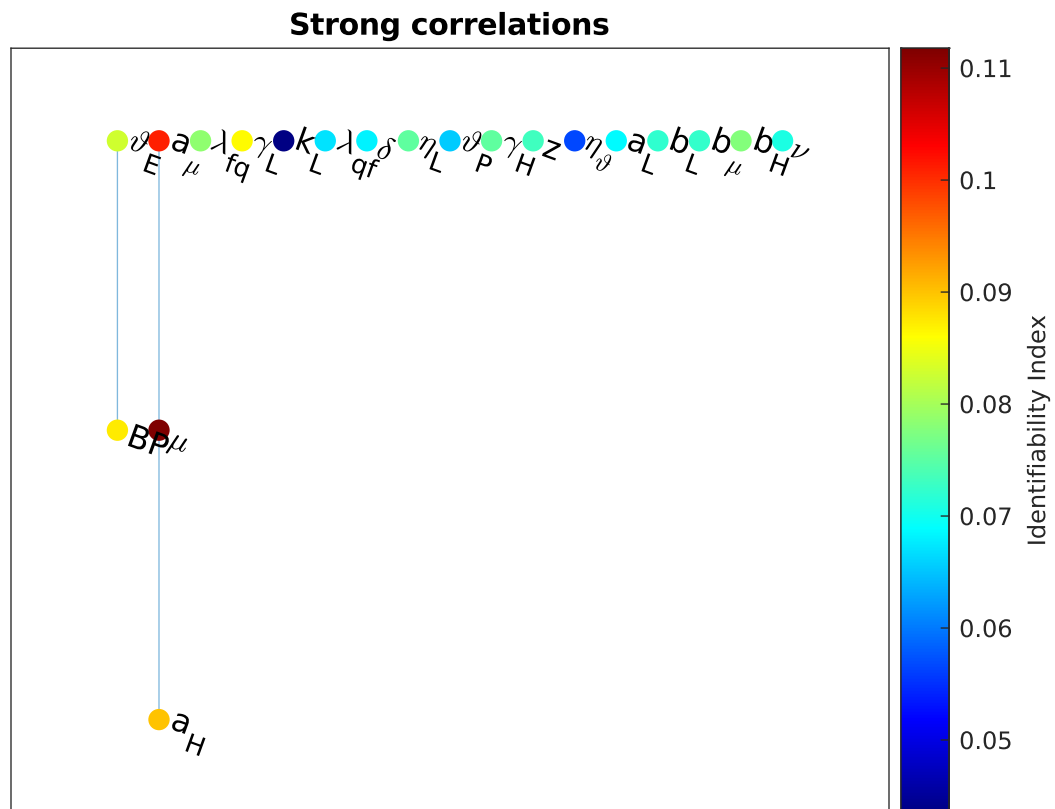
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0607'	'0.1765'	'0.027'	'0.0786'
$\vartheta_E$	'0.0004'	'0.001'	'0.0221'	'0.0009'	'0.0829'
$\gamma_L$	'0.3519'	'0.9604'	'0.3021'	'0.4807'	'0.0862'
$k_L$	'1'	'10'	'5.5007'	'5.4113'	'0.0436'
$\lambda_{qf}$	'0.0674'	'0.9618'	'0.6693'	'0.8617'	'0.067'
$\delta$	'0'	'0.0005'	'0.0206'	'0.0002'	'0.0682'
$\eta_L$	'0'	'1'	'0.5876'	'0.8204'	'0.0753'
$\vartheta_P$	'0'	'0'	'0.0002'	'0'	'0.0656'
$\gamma_H$	'0.05'	'1'	'0.5192'	'0.4614'	'0.0755'
$z$	'4.273'	'20.0716'	'14.0489'	'4.275'	'0.0732'
$\eta_{\vartheta}$	'0.8589'	'0.9942'	'0.894'	'0.9407'	'0.0567'
$a_L$	'5.4947'	'8.4359'	'2.8984'	'5.6644'	'0.0687'
$b_L$	'2.1723'	'4.3295'	'7.6468'	'2.2988'	'0.0721'
$a_{\mu}$	'1'	'15'	'6.5778'	'2.7359'	'0.1009'
$b_{\mu}$	'1'	'15'	'7.6369'	'10.8115'	'0.0726'
$\mu$	'0'	'0.0852'	'0.3434'	'0.0394'	'0.1118'
$a_H$	'1.258'	'13.3966'	'7.2202'	'4.3781'	'0.0902'
$b_H$	'1'	'15'	'8.4123'	'6.9418'	'0.0778'
$\nu$	'0.0214'	'0.8553'	'308.2896'	'0.3801'	'0.0709'
BP	'339.7717'	'346.1343'	'342.9985'	'342.4982'	'0.0874'

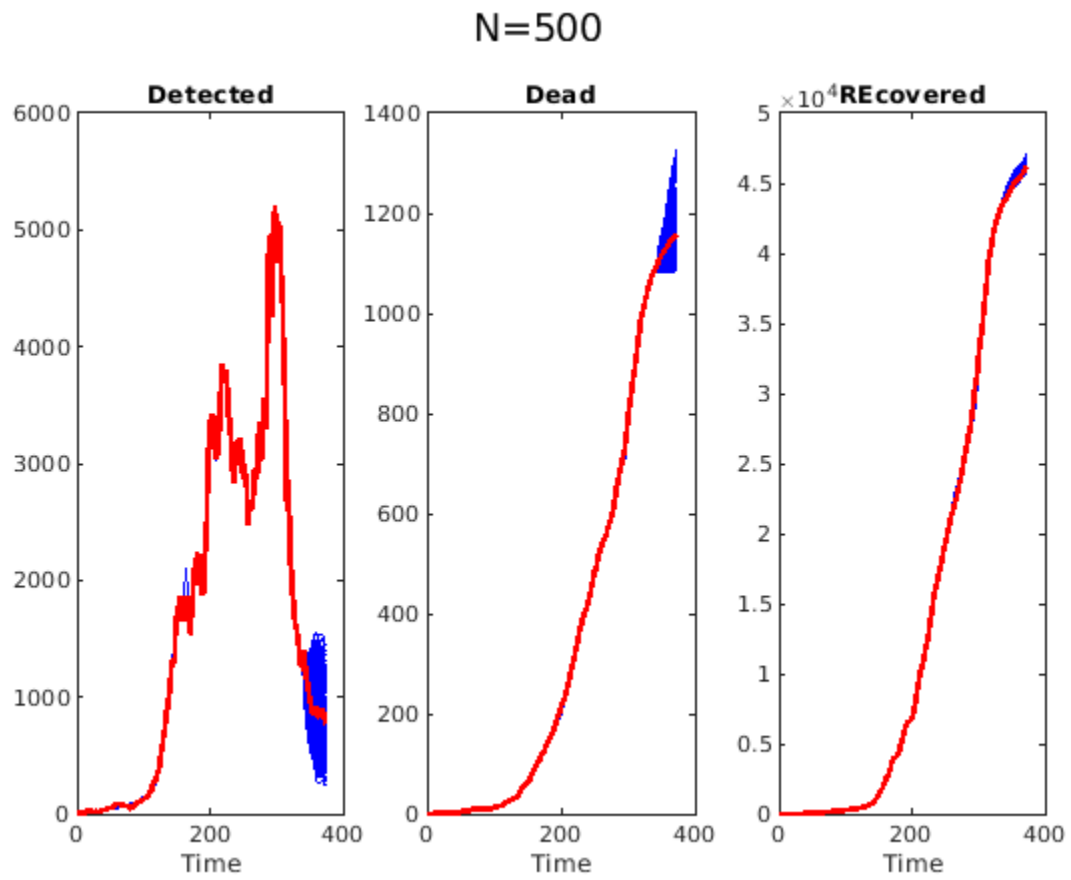
### 9.3. Identifiability analysis







## 9.4. Uncertainty analysis





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## Chapter 10. Extension number10

### 10.1. Basic information

The extension to be validated consists of the time series from the data374 to the 425. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was3000.

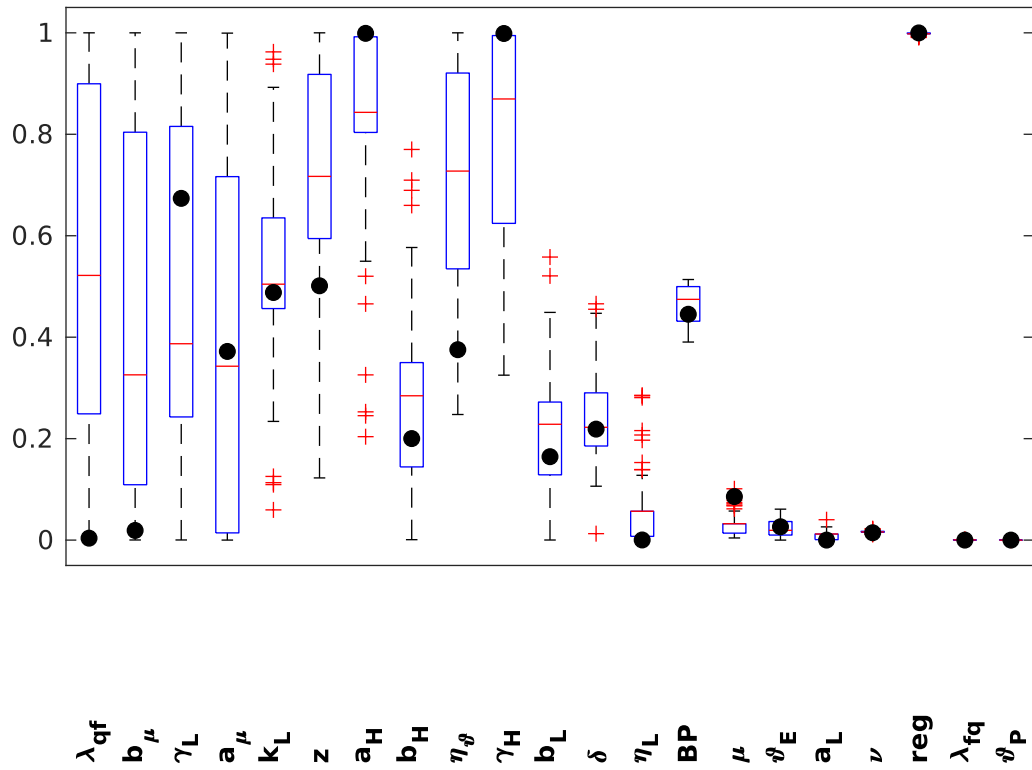
### 10.2. Estimated parameters with their intervals

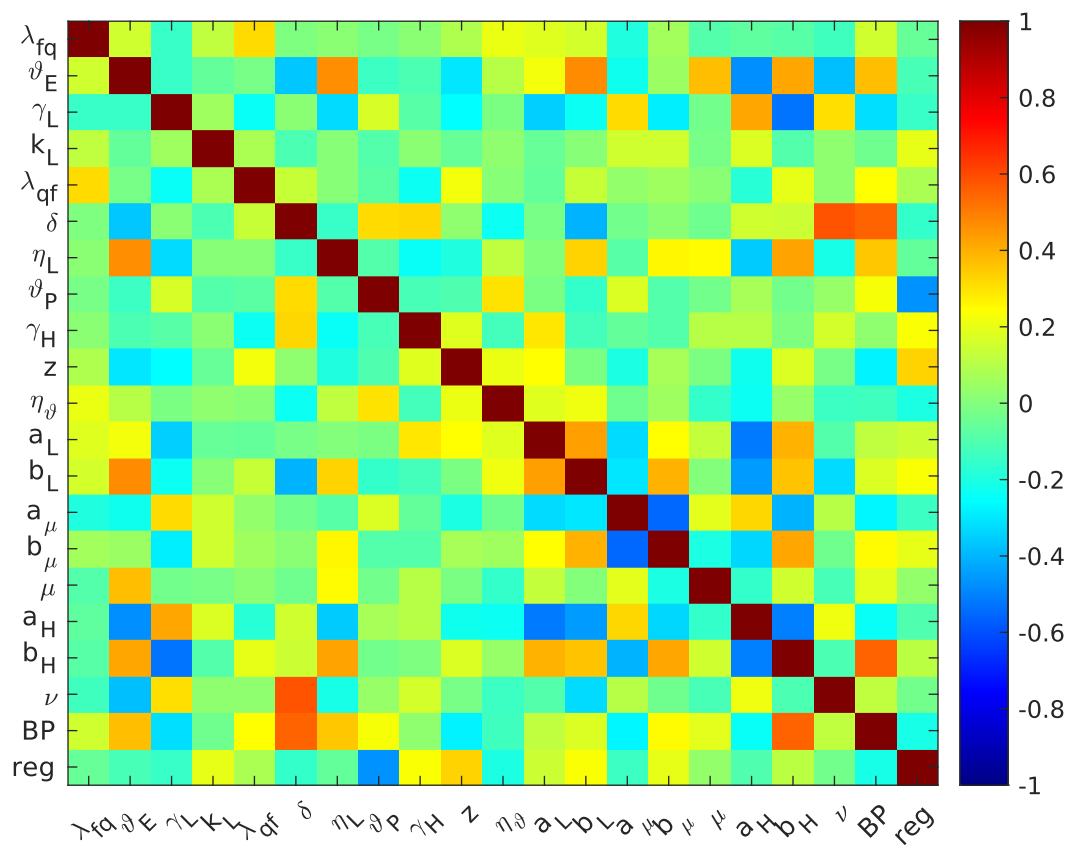
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

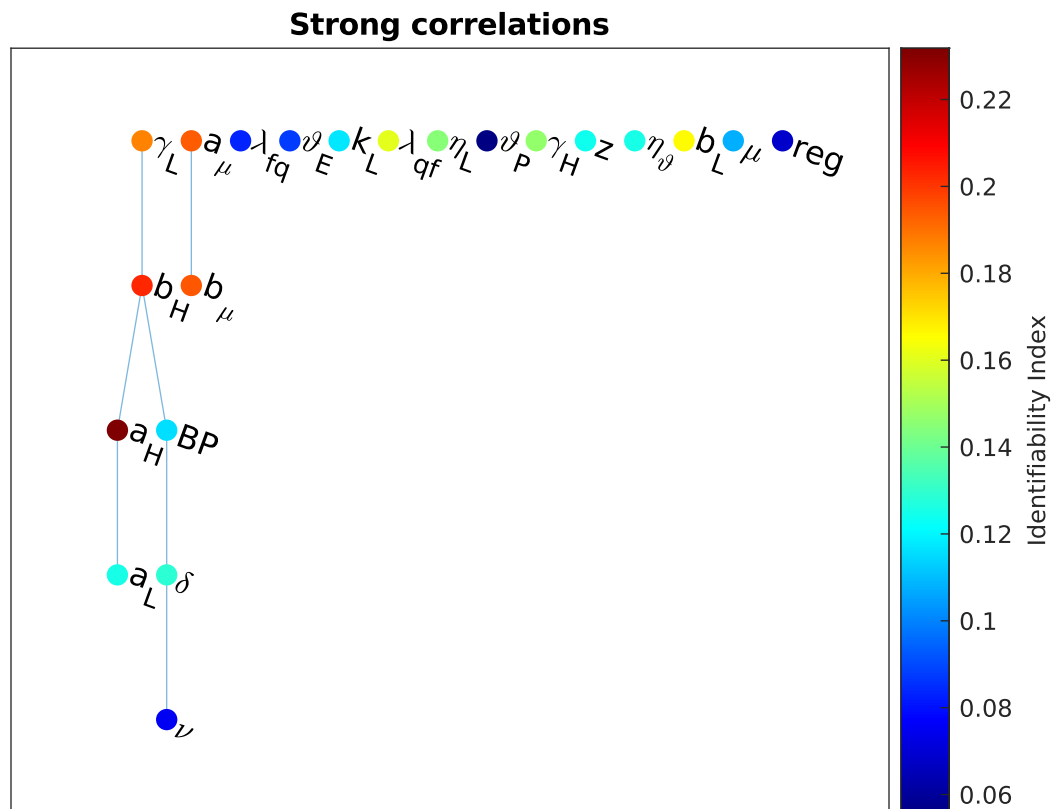
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0'	'0.0004'	'0'	'0.084'
$\vartheta_E$	'0.0143'	'0.0528'	'0.0193'	'0.0263'	'0.088'
$\gamma_L$	'0.5442'	'0.8222'	'0.3871'	'0.6737'	'0.1871'
$k_L$	'1.36'	'8.7677'	'5.5405'	'5.3928'	'0.1177'
$\lambda_{qf}$	'0'	'0.0074'	'0.5218'	'0.0038'	'0.1605'
$\delta$	'0.0285'	'0.0405'	'0.0334'	'0.0328'	'0.1288'
$\eta_L$	'0'	'0.0005'	'0.0569'	'0.0002'	'0.145'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0559'
$\gamma_H$	'0.2826'	'1'	'0.8696'	'0.9987'	'0.1472'
$z$	'14.7818'	'25.2697'	'21.5099'	'15.0398'	'0.1246'
$\eta_{\vartheta}$	'0.2968'	'0.9212'	'0.7275'	'0.3753'	'0.126'
$a_L$	'1'	'1.0966'	'1.1678'	'1.0003'	'0.1259'
$b_L$	'2.965'	'3.5582'	'4.1968'	'3.3019'	'0.1664'
$a_{\mu}$	'5.6683'	'12.2568'	'5.7988'	'6.2067'	'0.1938'
$b_{\mu}$	'1.2546'	'2.8052'	'5.5609'	'1.2661'	'0.194'
$\mu$	'0.0044'	'0.1689'	'0.0323'	'0.0858'	'0.1081'
$a_H$	'8.4535'	'15'	'12.8053'	'14.9856'	'0.2318'
$b_H$	'3.3157'	'8.6418'	'4.9832'	'3.8017'	'0.2027'
$\nu$	'5.7615'	'7.8364'	'8.0456'	'7.2442'	'0.0754'
BP	'374.4688'	'376.7029'	'376.6451'	'374.5'	'0.116'
reg	'0.2123'	'0.25'	'0.2495'	'0.25'	'0.069'

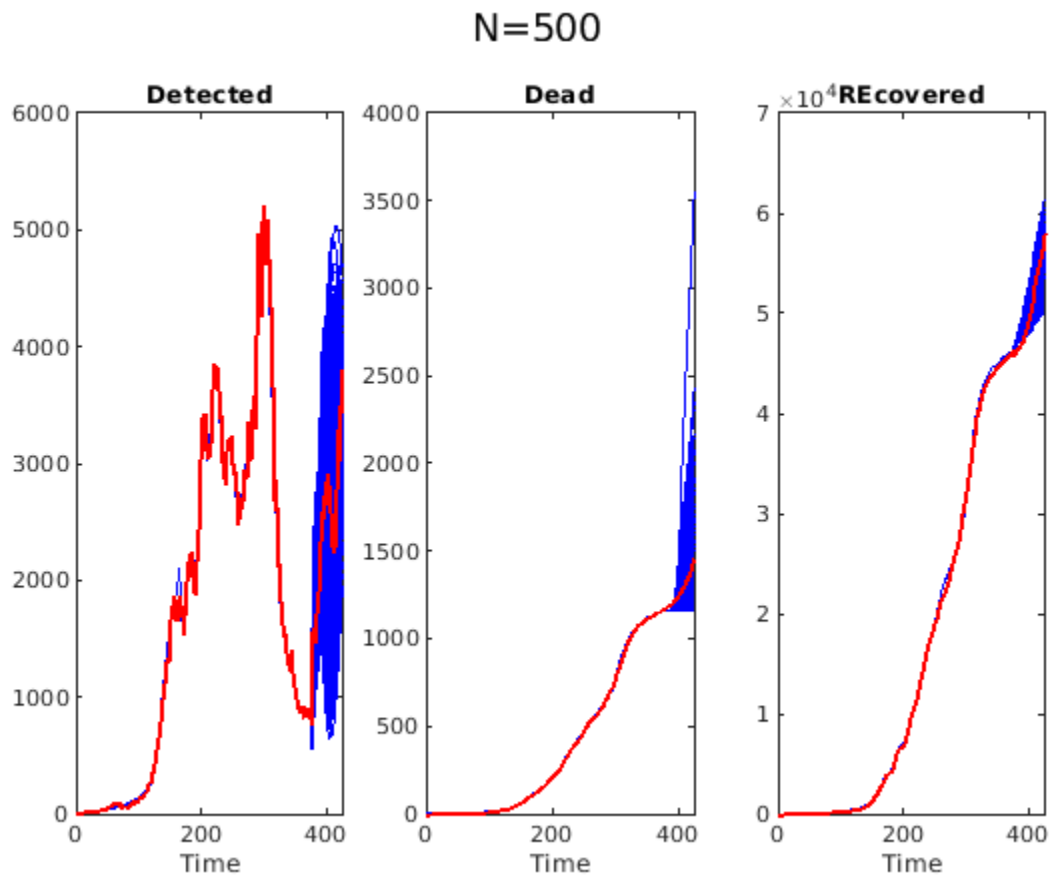
### 10.3. Identifiability analysis







## 10.4. Uncertainty analysys



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## Chapter 11. Extension number11

### 11.1. Basic information

The extension to be validated consists of the time series from the data425 to the 445. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

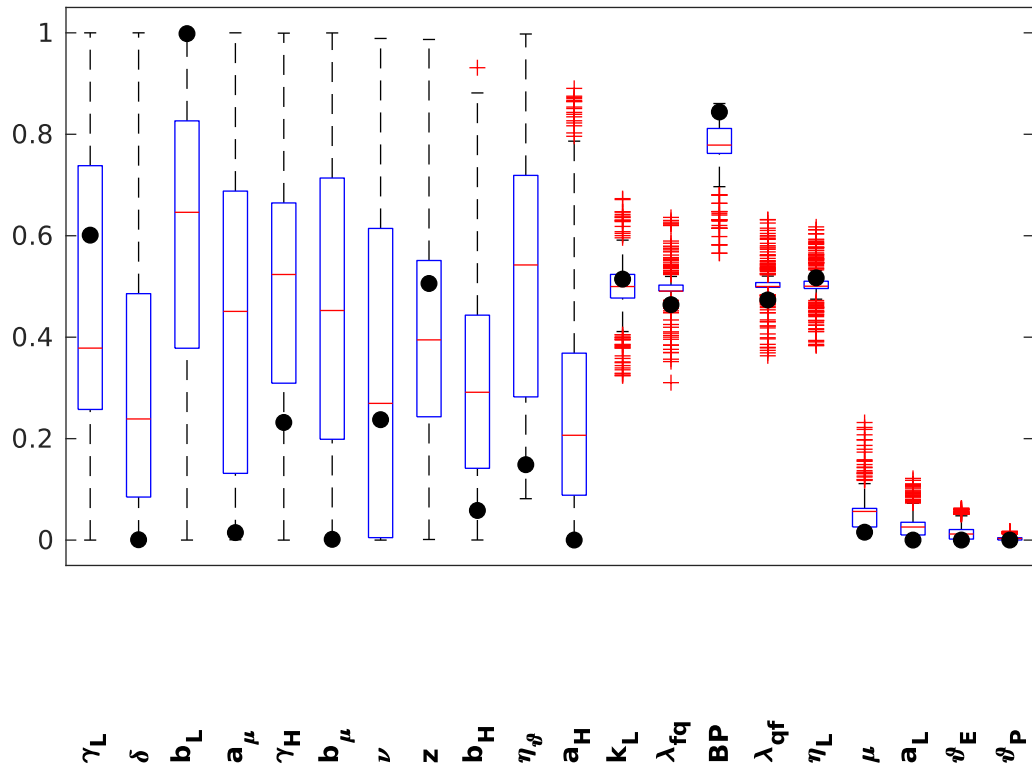
### 11.2. Estimated parameters with their intervals

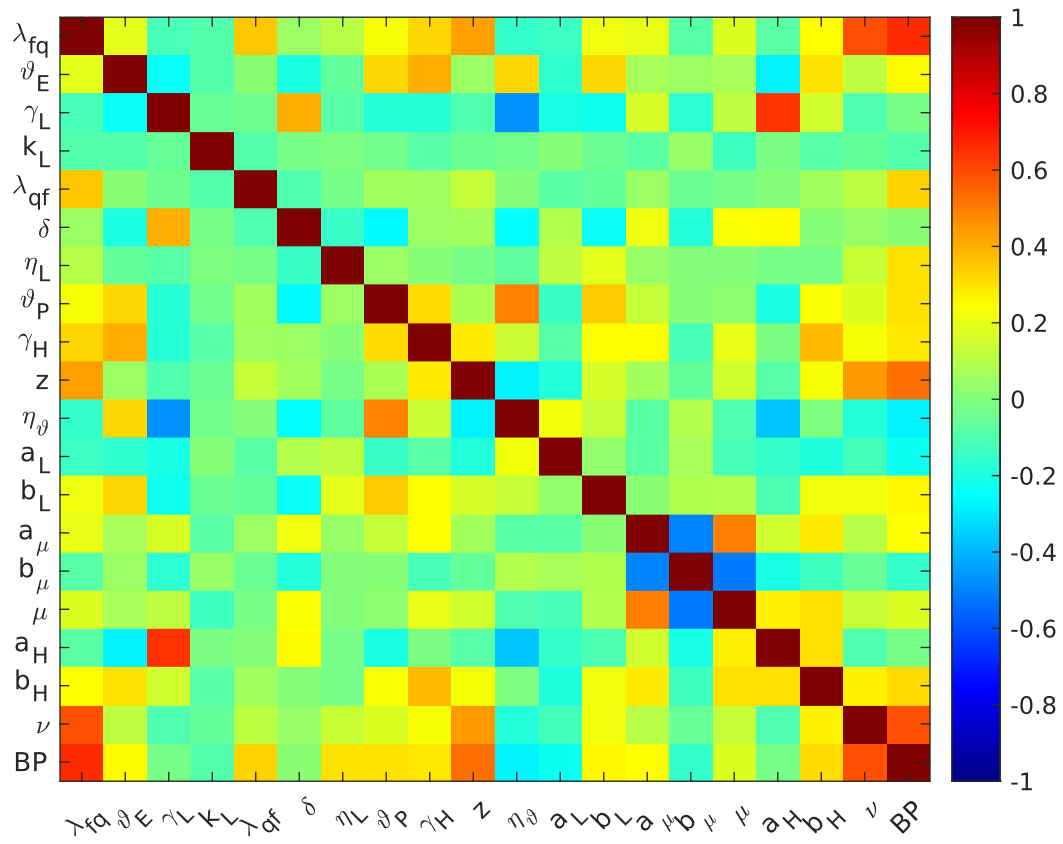
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

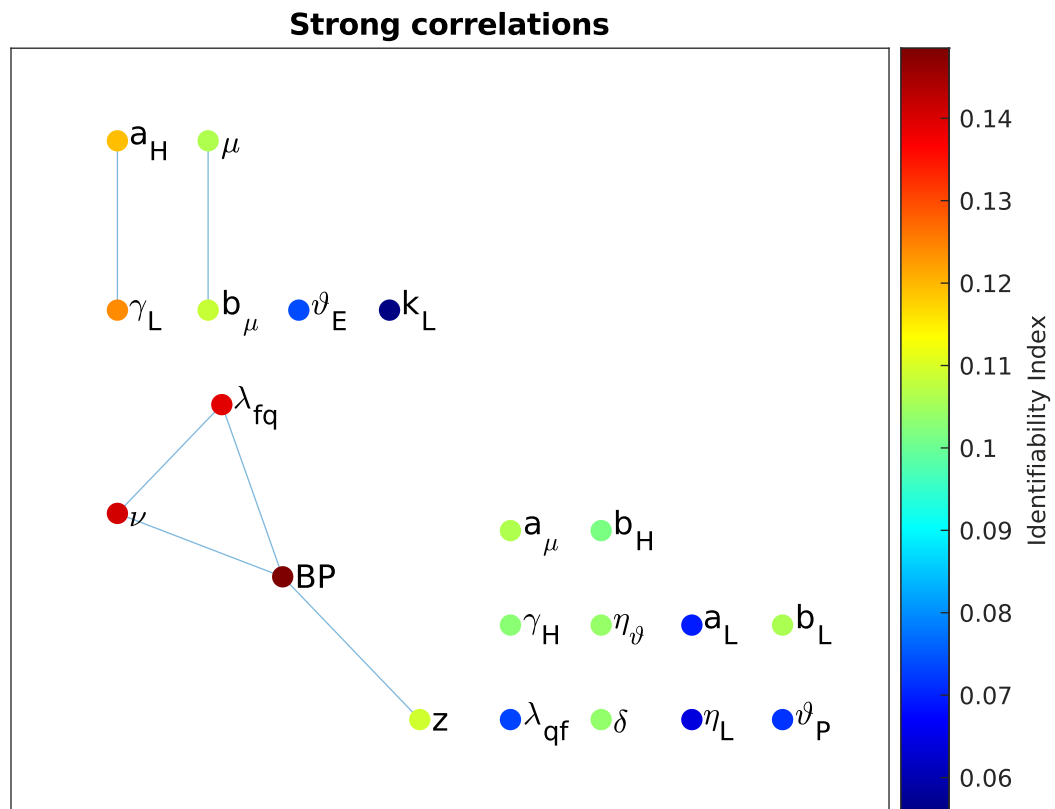
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'1'	'0.4908'	'0.4641'	'0.1393'
$\vartheta_E$	'0'	'0.0002'	'0.012'	'0.0001'	'0.074'
$\gamma_L$	'0.5284'	'0.6289'	'0.3785'	'0.6012'	'0.1239'
$k_L$	'1'	'9.55'	'5.4986'	'5.6306'	'0.0558'
$\lambda_{qf}$	'0'	'1'	'0.4999'	'0.4734'	'0.0735'
$\delta$	'0'	'0.0002'	'0.0358'	'0.0001'	'0.1038'
$\eta_L$	'0'	'1'	'0.5005'	'0.5169'	'0.0645'
$\vartheta_P$	'0.0001'	'0.0034'	'0.0032'	'0.0001'	'0.0719'
$\gamma_H$	'0.1031'	'1'	'0.5236'	'0.2319'	'0.1032'
$z$	'0.6'	'30'	'11.841'	'15.1765'	'0.1094'
$\eta_{\vartheta}$	'0.1122'	'0.223'	'0.5424'	'0.1487'	'0.1041'
$a_L$	'1'	'1.1914'	'1.3609'	'1.0008'	'0.0698'
$b_L$	'11.4766'	'15'	'10.0466'	'14.9778'	'0.1058'
$a_{\mu}$	'1'	'15'	'7.3119'	'1.2069'	'0.1064'
$b_{\mu}$	'1'	'15'	'7.3365'	'1.0211'	'0.1087'
$\mu$	'0'	'0.0333'	'0.0565'	'0.0156'	'0.1063'
$a_H$	'1'	'9.4499'	'3.893'	'1.0017'	'0.1194'
$b_H$	'1.5972'	'9.0973'	'5.0801'	'1.8179'	'0.1014'
$\nu$	'23.4165'	'480.9367'	'134.7599'	'118.6925'	'0.1408'
BP	'425.4547'	'432.3971'	'421.5'	'425.4855'	'0.1485'

### 11.3. Identifiability analysis



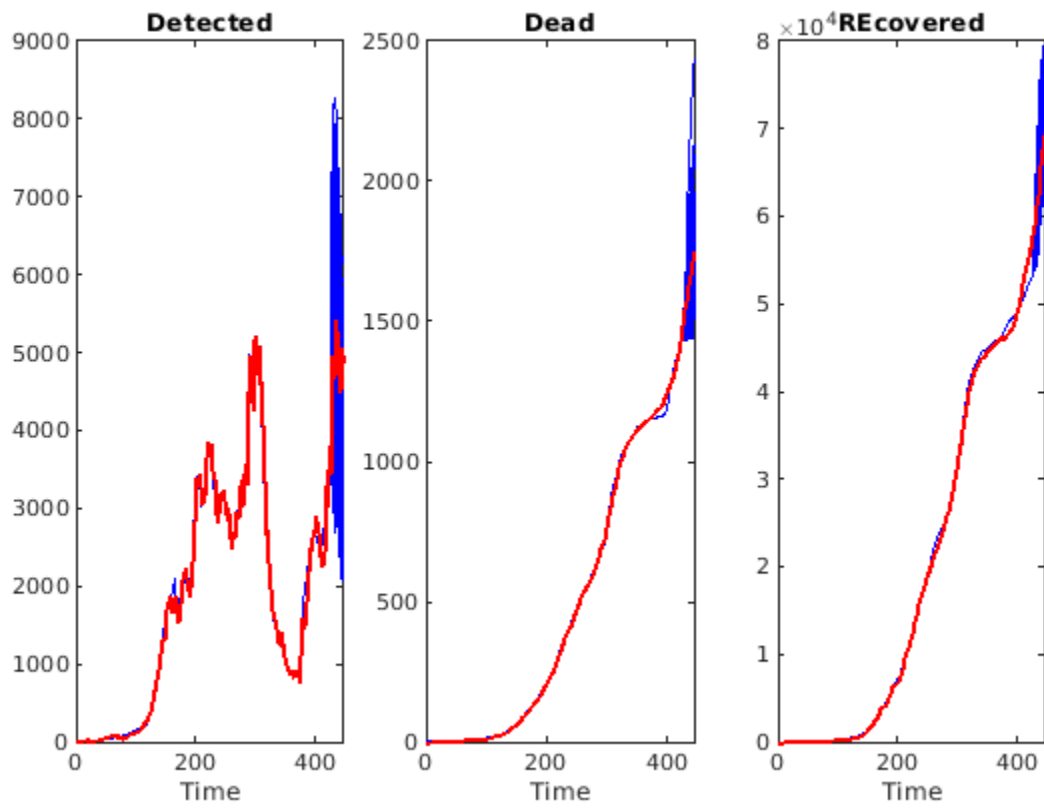






## 11.4. Uncertainty analysys

N=500



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## Chapter 12. Extension number12

### 12.1. Basic information

The extension to be validated consists of the time series from the data445 to the 446. The status of the validation is: COMPLETED.

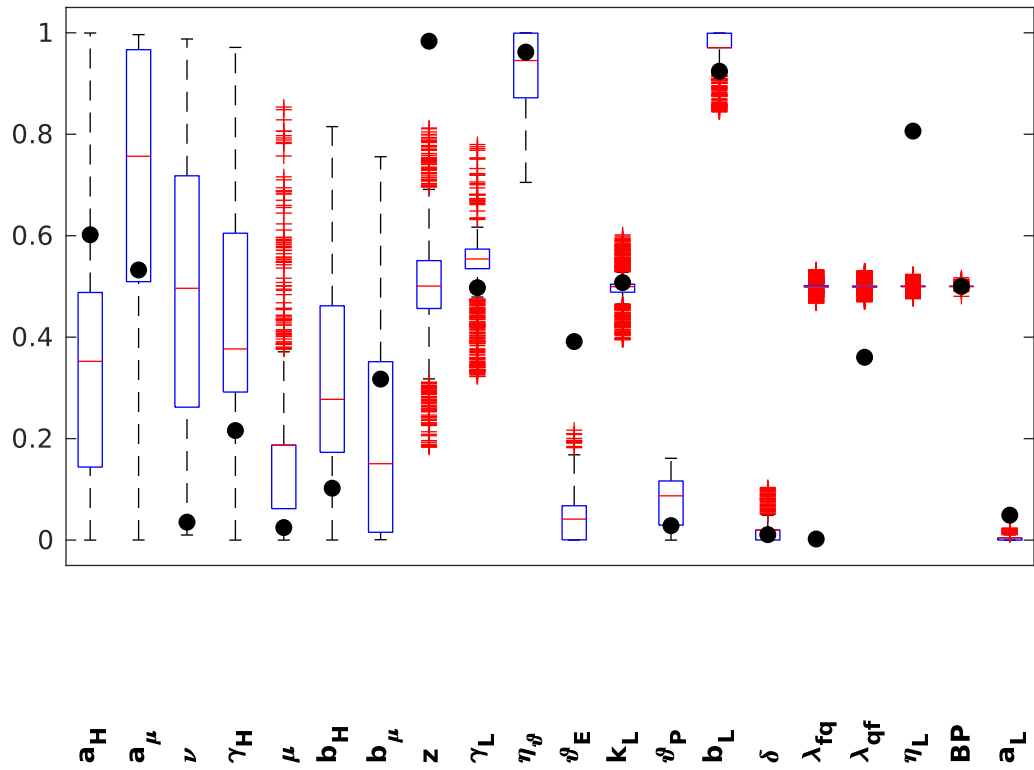
The number of estimations needed to perform the validation was1000.

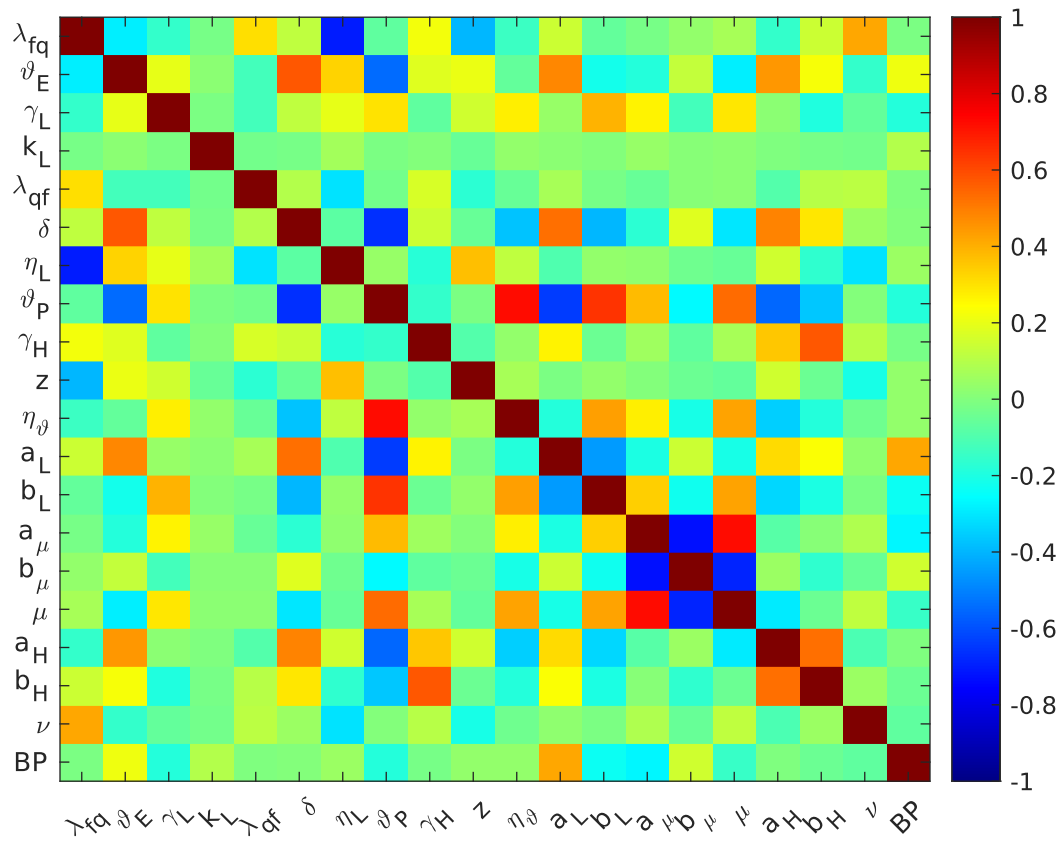
### 12.2. Estimated parameters with their intervals

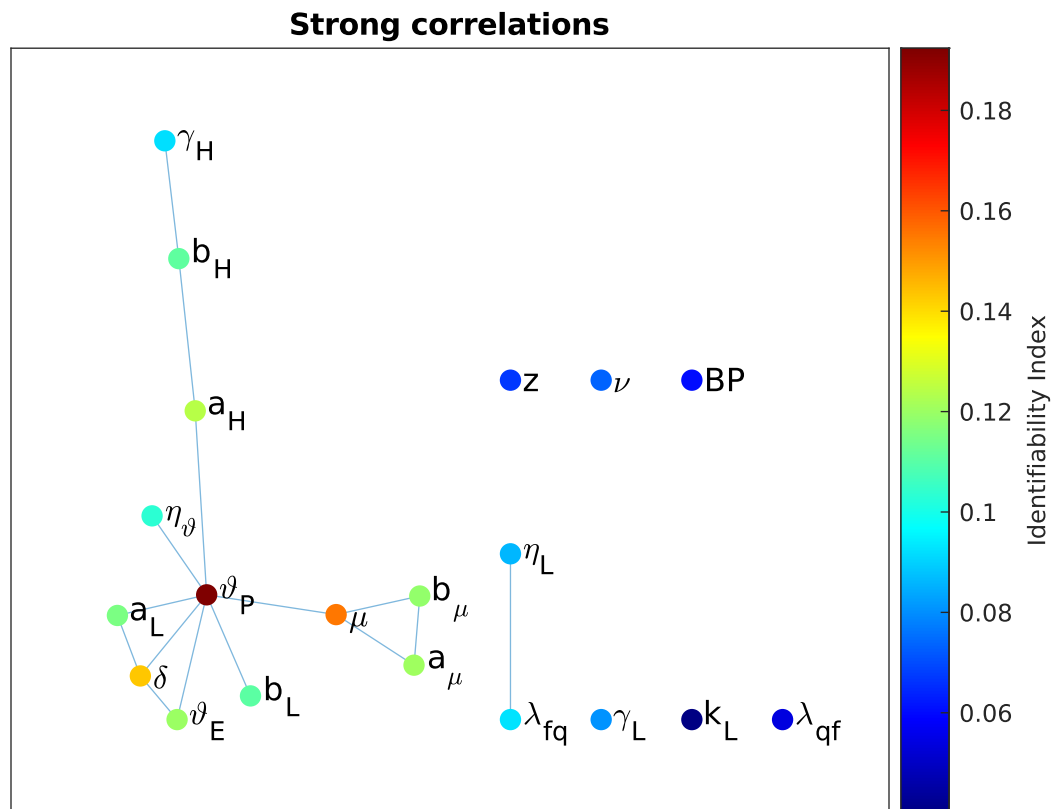
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4882'	'0.5117'	'0.4999'	'0.0022'	'0.0925'
\vartheta_E	'0.0322'	'0.0506'	'0.0414'	'0.3914'	'0.1201'
\gamma_L	'0.5376'	'0.5707'	'0.5541'	'0.4975'	'0.0811'
k_L	'5.4186'	'5.5743'	'5.4964'	'5.5683'	'0.0402'
\lambda_{qf}	'0.4943'	'0.5055'	'0.4999'	'0.3604'	'0.0542'
\delta	'0'	'0.0068'	'0.003'	'0.0016'	'0.1432'
\eta_L	'0.4924'	'0.5079'	'0.5002'	'0.8062'	'0.0865'
\vartheta_P	'0.0835'	'0.0911'	'0.0873'	'0.0285'	'0.1924'
\gamma_H	'0.3573'	'0.3963'	'0.3768'	'0.2159'	'0.0921'
z	'14.5698'	'15.4739'	'15.0219'	'29.503'	'0.0672'
\eta_{\vartheta}	'0.9292'	'0.9614'	'0.9453'	'0.9619'	'0.1036'
a_L	'1'	'1.2501'	'1.0617'	'1.688'	'0.1152'
b_L	'14.3512'	'14.8252'	'14.5882'	'13.9391'	'0.1105'
a_{\mu}	'11.2903'	'11.8957'	'11.593'	'8.4548'	'0.1207'
b_{\mu}	'2.7174'	'3.4981'	'3.1078'	'5.4434'	'0.1192'
\mu	'0.1544'	'0.2201'	'0.1873'	'0.0247'	'0.155'
a_H	'5.6753'	'6.1917'	'5.9335'	'9.4262'	'0.1243'
b_H	'4.6527'	'5.1178'	'4.8852'	'2.4316'	'0.1114'
\nu	'236.3317'	'260.0404'	'248.186'	'17.6871'	'0.0737'
BP	'430.4043'	'430.5964'	'430.5003'	'430.5'	'0.0607'

### 12.3. Identifiability analysis

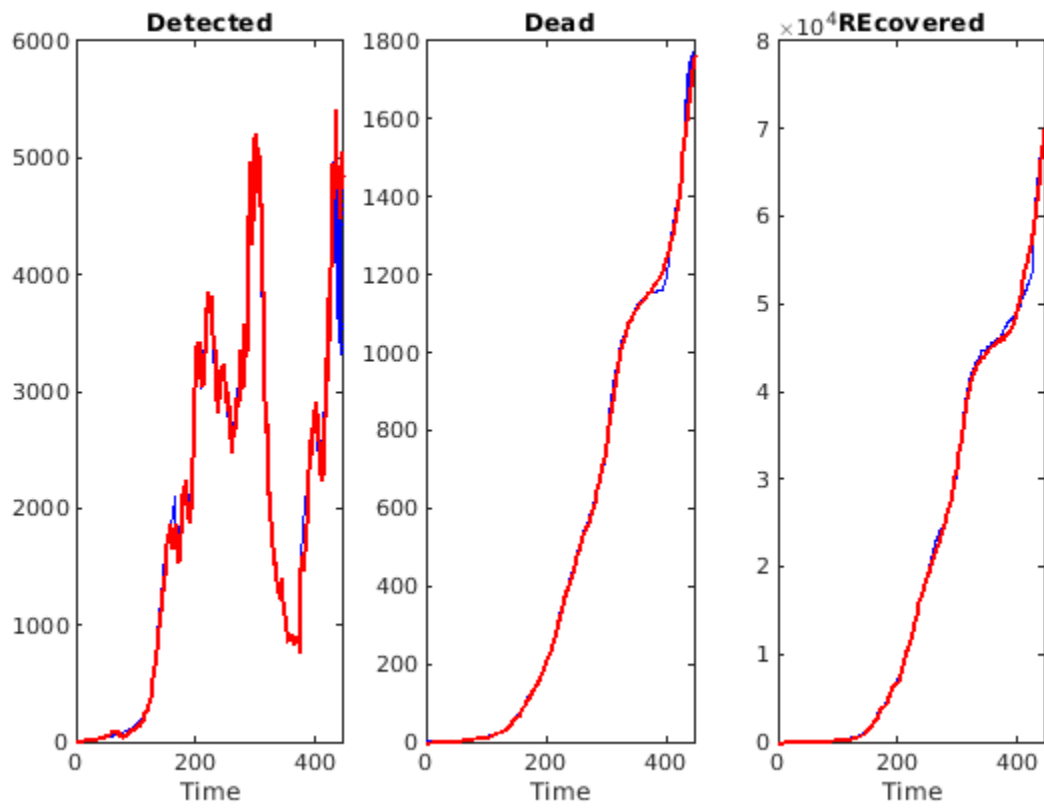






## 12.4. Uncertainty analysis

N=500



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## Chapter 13. Extension number13

### 13.1. Basic information

The extension to be validated consists of the time series from the data446 to the 527. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was24000.

### 13.2. Estimated parameters with their intervals

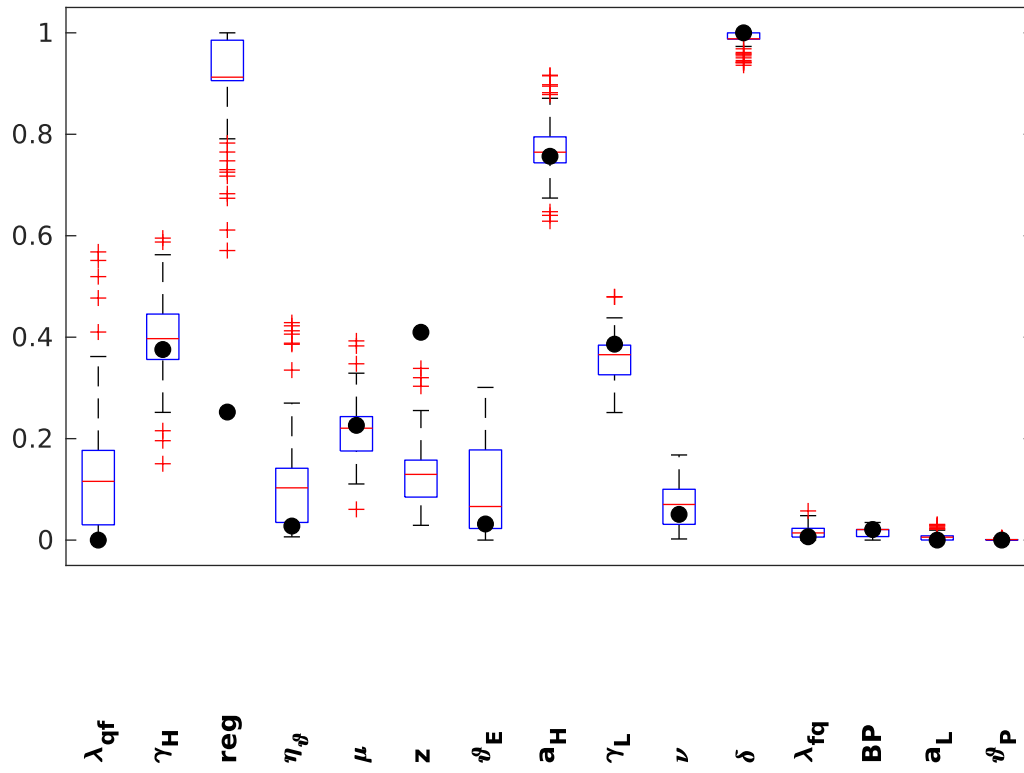
It was necessary to fix 6 parameters of 11 that could be fixed to complete validation.

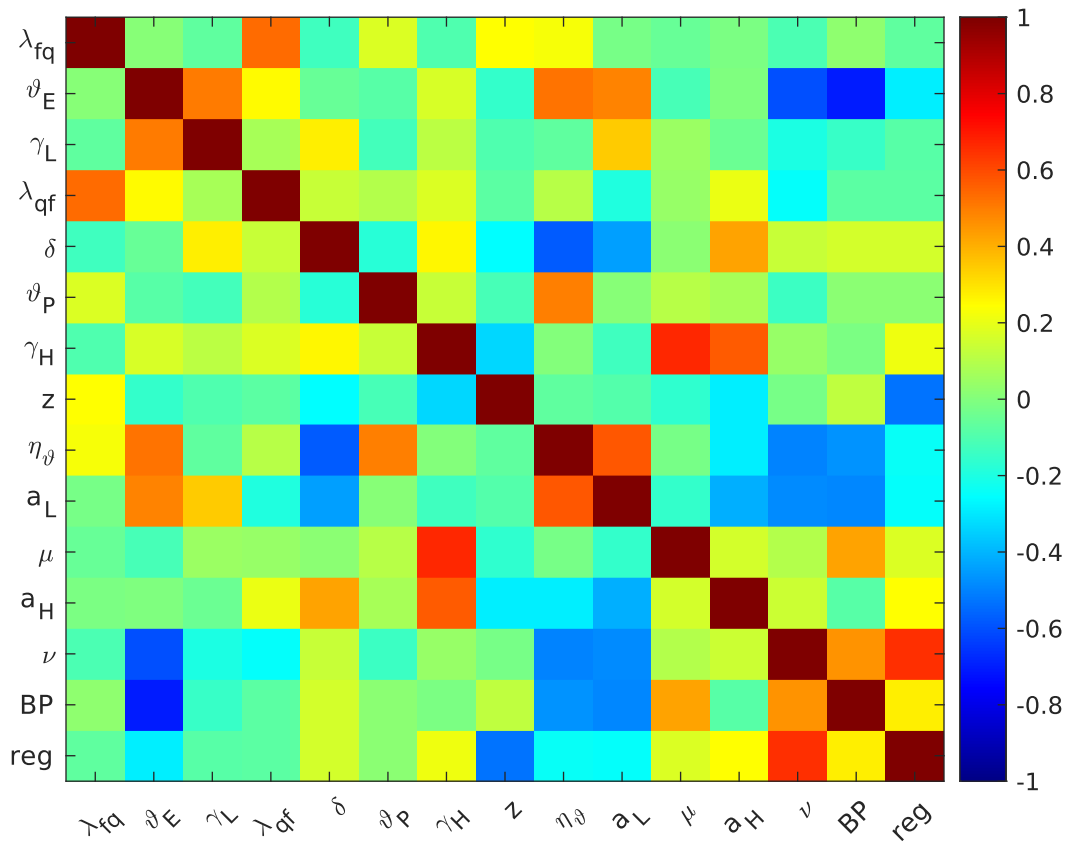
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

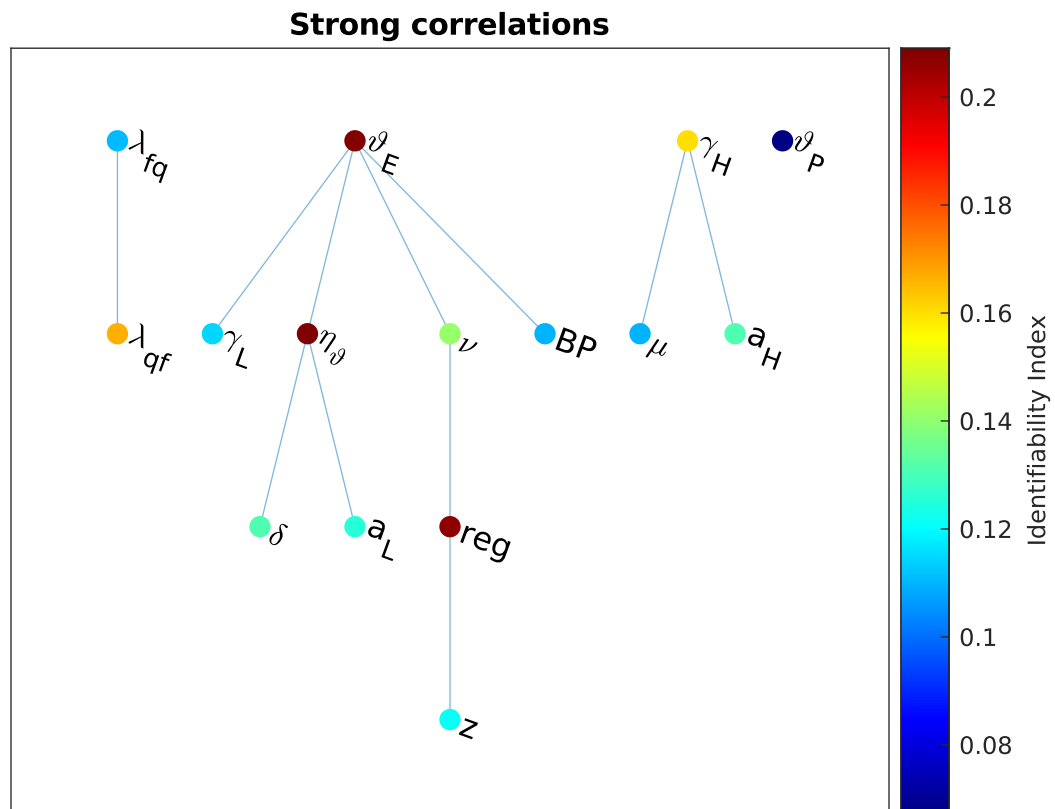
	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.004'	'0.0147'	'0.0141'	'0.0065'	'0.1108'
\vartheta_E	'0'	'0.0715'	'0.0662'	'0.0318'	'0.2082'
\gamma_L	'0.324'	'0.3941'	'0.3655'	'0.3862'	'0.1148'
k_L	'5.5547'	'5.5547'	'5.5547'	'5.5547'	'0'
\lambda_{qf}	'0'	'0'	'0.1158'	'0'	'0.1669'
\delta	'0.015'	'0.15'	'0.1482'	'0.15'	'0.1312'
\eta_L	'0.695'	'0.695'	'0.695'	'0.695'	'0'
\vartheta_P	'0'	'0.0001'	'0.001'	'0'	'0.0675'
\gamma_H	'0.1098'	'1'	'0.3971'	'0.3757'	'0.1601'
z	'9.1926'	'27.6529'	'3.8862'	'12.2902'	'0.1214'
\eta_{\vartheta}	'0'	'0.0623'	'0.103'	'0.0277'	'0.209'
a_L	'1'	'2.8661'	'1.0804'	'1.0009'	'0.1257'
b_L	'7.4886'	'7.4886'	'7.4886'	'7.4886'	'0'
a_{\mu}	'7.253'	'7.253'	'7.253'	'7.253'	'0'
b_{\mu}	'2.8426'	'2.8426'	'2.8426'	'2.8426'	'0'
\mu	'0'	'0.5089'	'0.2206'	'0.2262'	'0.1099'
a_H	'3.8'	'14.44'	'11.7056'	'11.5923'	'0.1312'
b_H	'10.304'	'10.304'	'10.304'	'10.304'	'0'
\nu	'21.0577'	'38.7452'	'35.1251'	'25.3608'	'0.1411'
BP	'445.9797'	'451.1084'	'446.5'	'446.5'	'0.11'
reg	'0.0607'	'0.1222'	'0.2281'	'0.0631'	'0.2065'



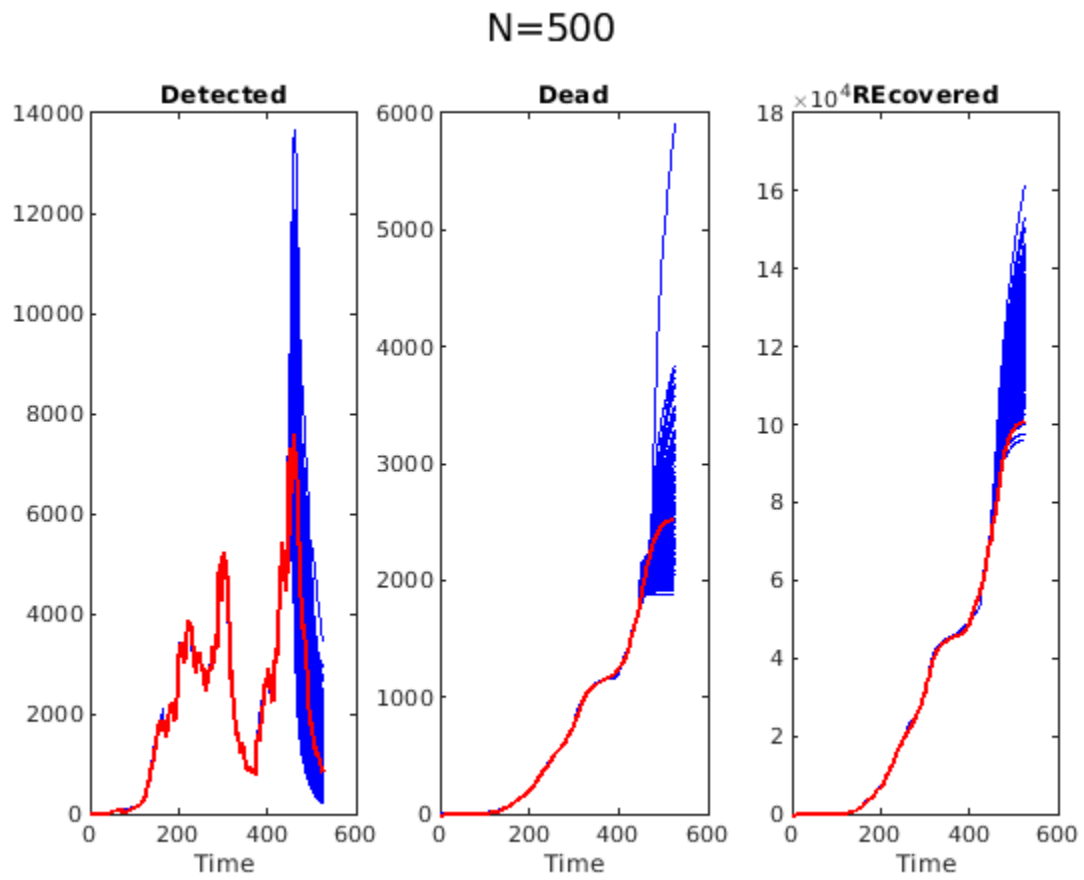
### 13.3. Identifiability analysis







### 13.4. Uncertainty analysis



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## Chapter 14. Extension number14

### 14.1. Basic information

The extension to be validated consists of the time series from the data527 to the 527. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

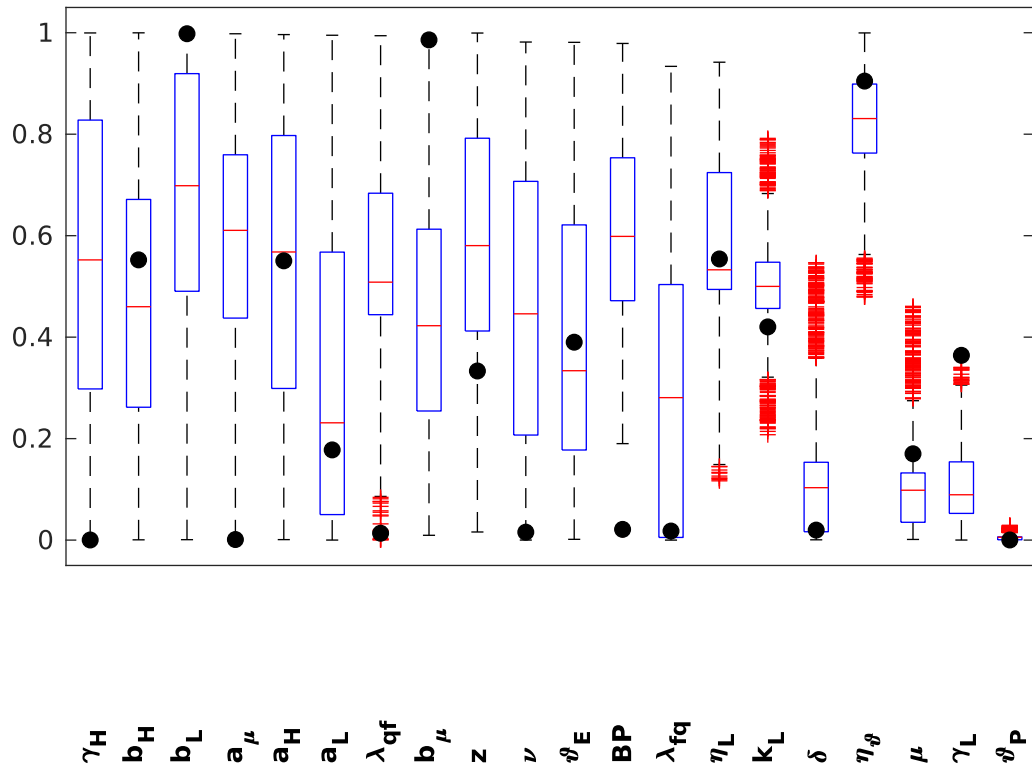
### 14.2. Estimated parameters with their intervals

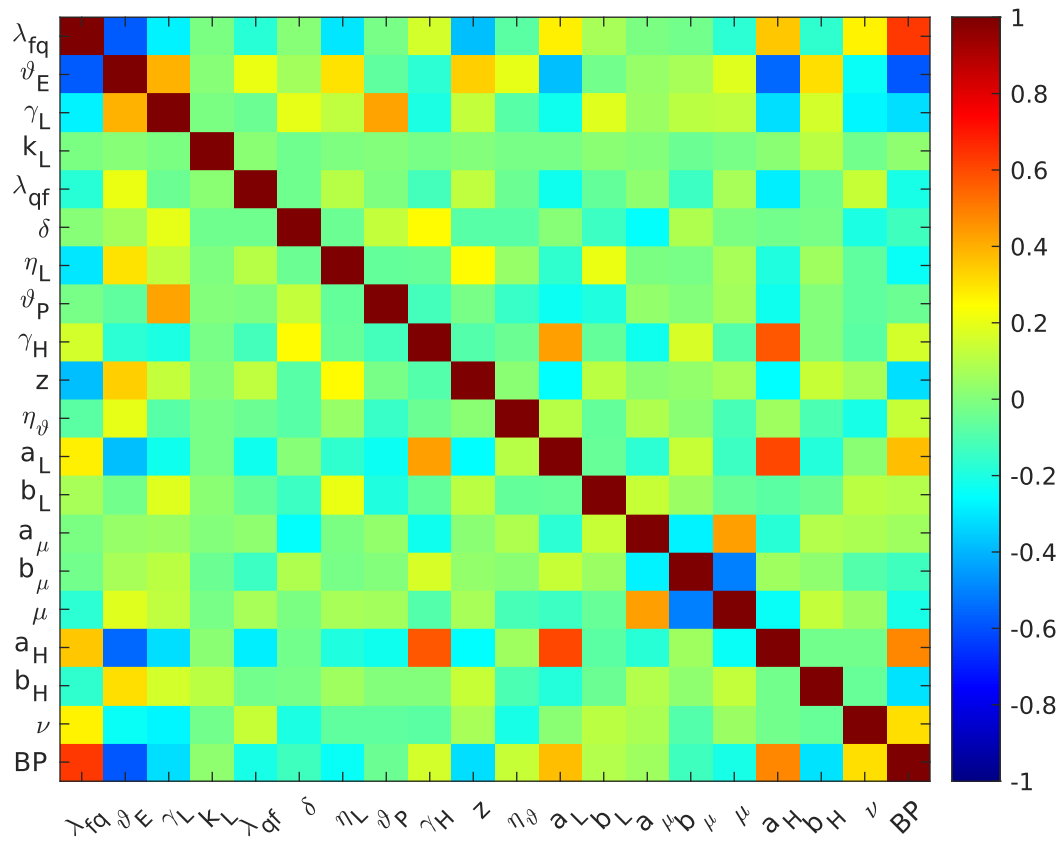
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

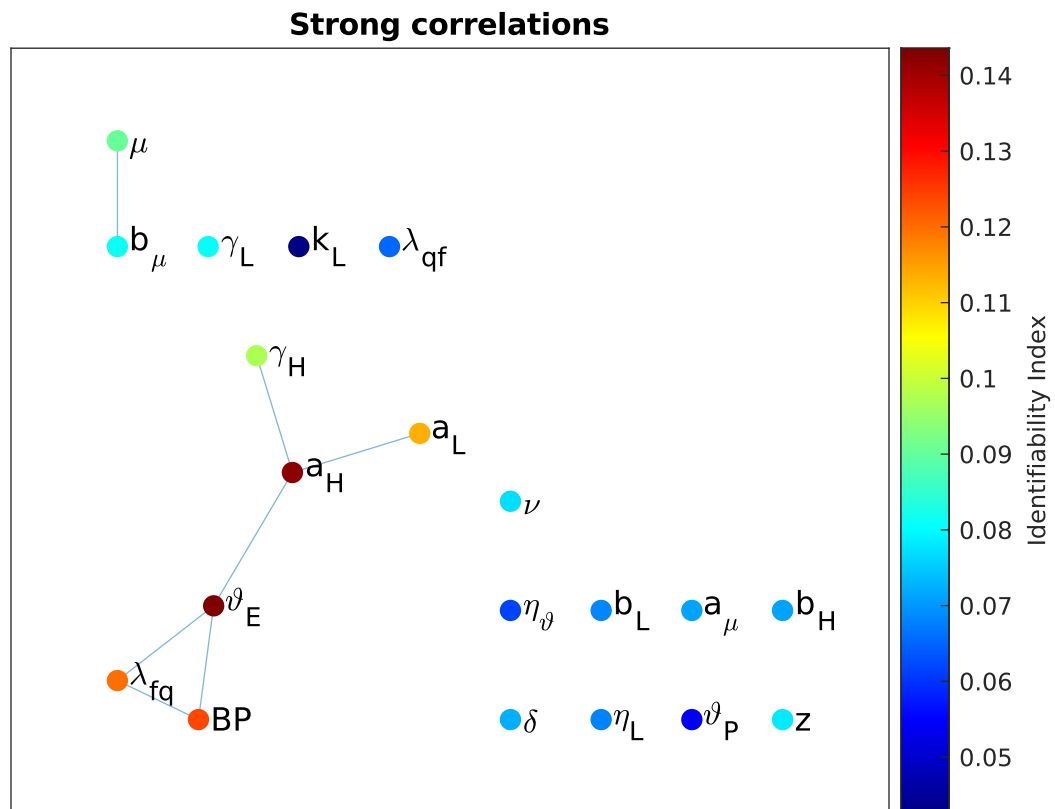
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0179'	'0.0179'	'0.2808'	'0.0179'	'0.1196'
$\vartheta_E$	'0.273'	'0.5851'	'0.3338'	'0.39'	'0.1436'
$\gamma_L$	'0.2549'	'0.5463'	'0.0894'	'0.3642'	'0.0807'
$k_L$	'3.3472'	'7.1727'	'5.5003'	'4.7818'	'0.0427'
$\lambda_{qf}$	'0.0095'	'0.0203'	'0.5084'	'0.0135'	'0.0652'
$\delta$	'0.0021'	'0.0044'	'0.0155'	'0.003'	'0.0724'
$\eta_L$	'0.3879'	'0.8312'	'0.5327'	'0.5541'	'0.0681'
$\vartheta_P$	'0.0002'	'0.0004'	'0.0057'	'0.0002'	'0.0544'
$\gamma_H$	'0.0002'	'0.0003'	'0.5523'	'0.0002'	'0.0973'
$z$	'6.9993'	'14.9985'	'17.4124'	'9.999'	'0.0782'
$\eta_{\vartheta}$	'0.6333'	'1'	'0.8307'	'0.9047'	'0.0617'
$a_L$	'2.4421'	'5.233'	'4.2364'	'3.4887'	'0.1135'
$b_L$	'10.4806'	'15'	'10.7787'	'14.9723'	'0.0685'
$a_{\mu}$	'1'	'1.5234'	'9.5469'	'1.0156'	'0.0715'
$b_{\mu}$	'10.362'	'15'	'6.9158'	'14.8028'	'0.0815'
$\mu$	'0.1191'	'0.2552'	'0.0985'	'0.1701'	'0.0906'
$a_H$	'6.0943'	'13.0592'	'8.9503'	'8.7061'	'0.1423'
$b_H$	'6.1125'	'13.0983'	'7.4399'	'8.7322'	'0.0713'
$\nu$	'5.4788'	'11.7402'	'222.9899'	'7.8268'	'0.0771'
BP	'446'	'517'	'488.5'	'447.5'	'0.1235'

### 14.3. Identifiability analysis

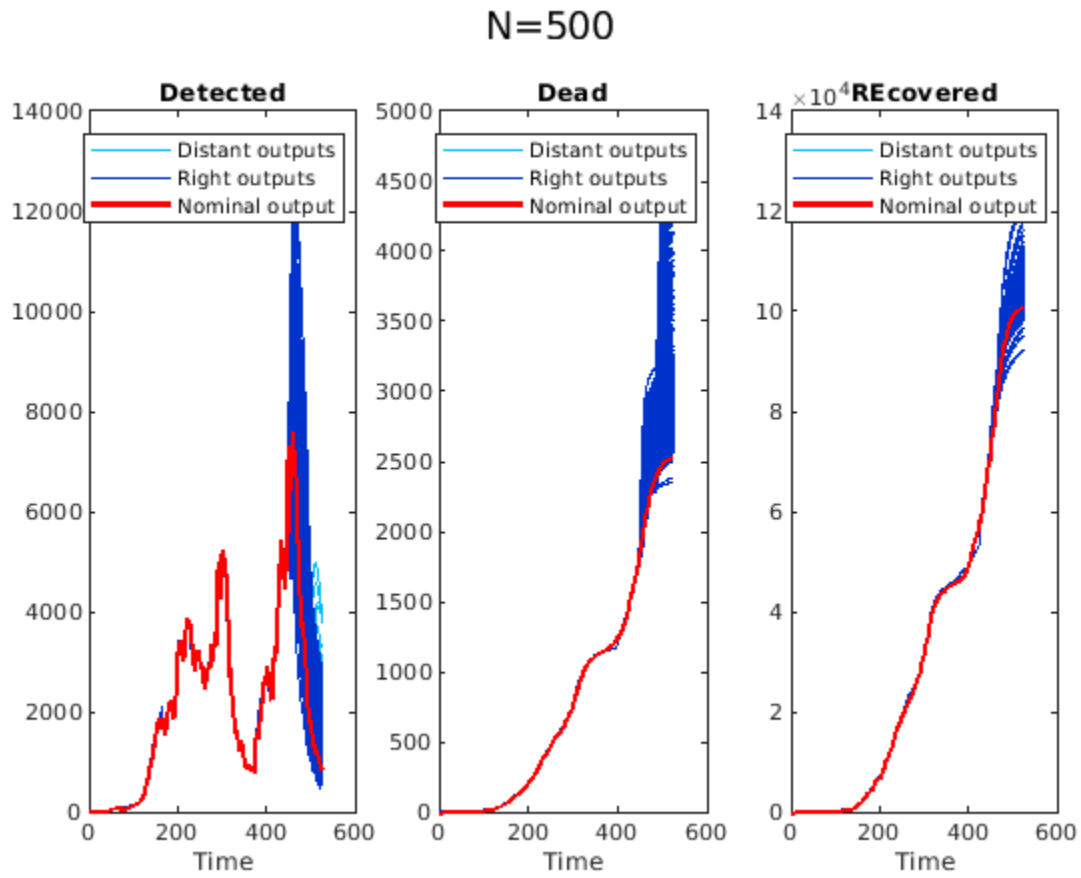








## 14.4. Uncertainty analysys



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## Chapter 15. Extension number15

### 15.1. Basic information

The extension to be validated consists of the time series from the data527 to the 709. The status of the validation is: COMPLETED.

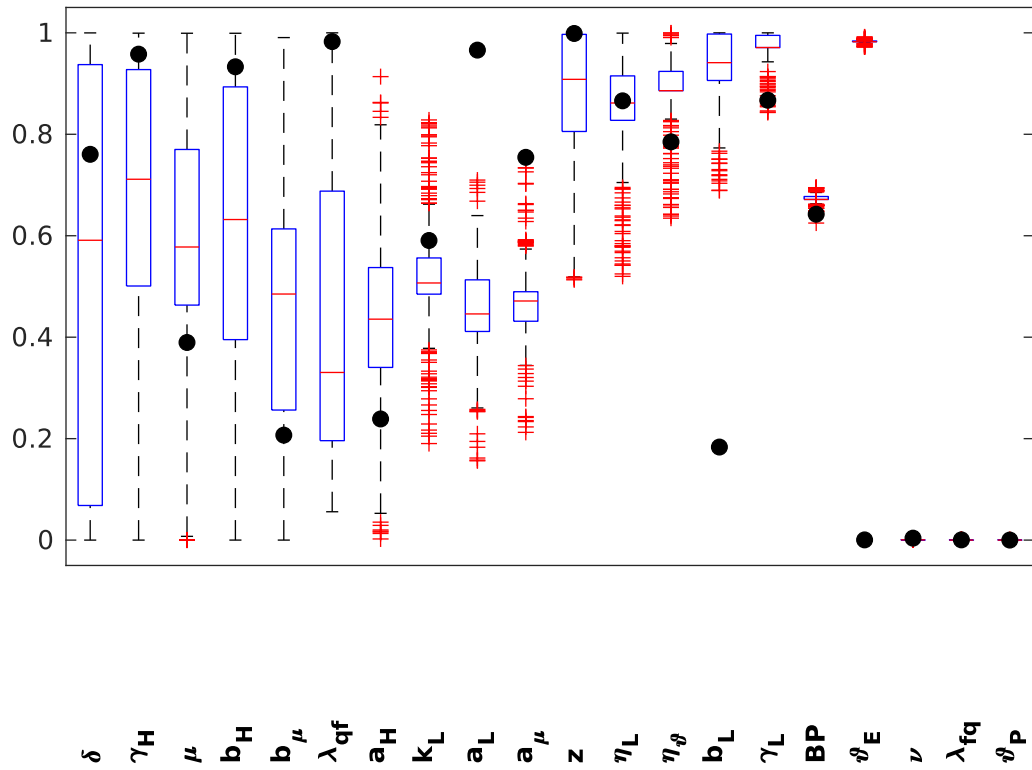
The number of estimations needed to perform the validation was3000.

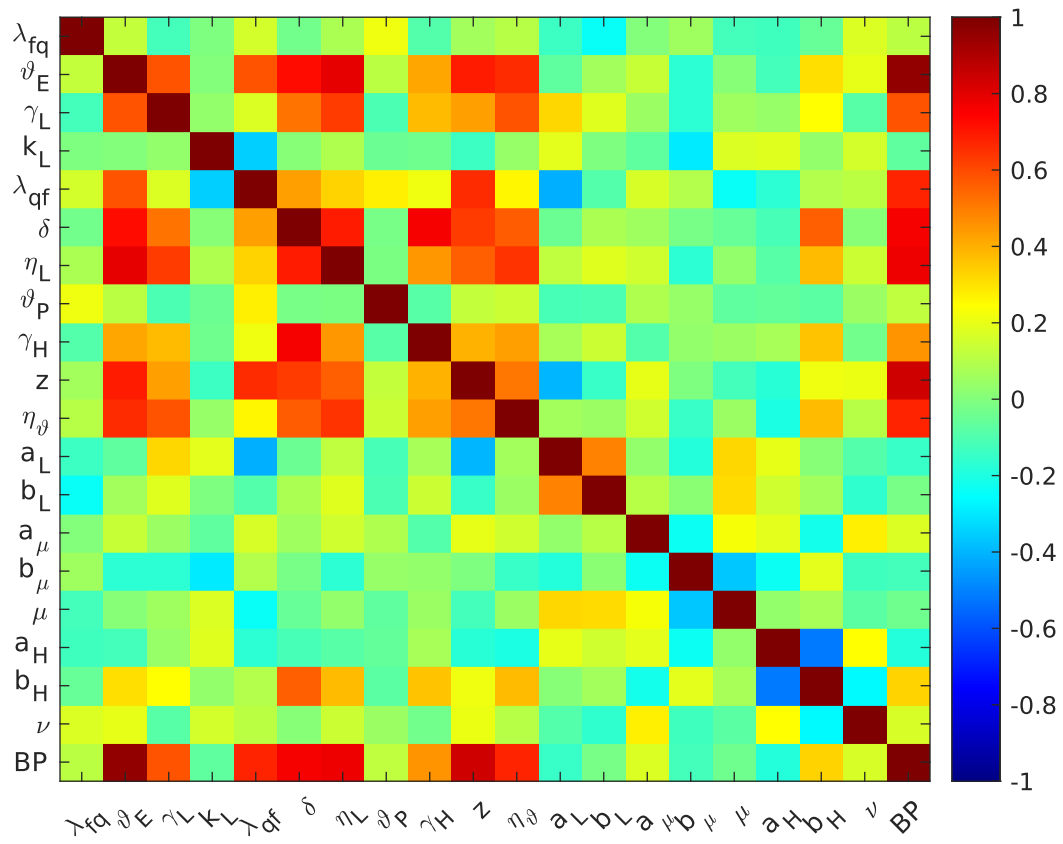
### 15.2. Estimated parameters with their intervals

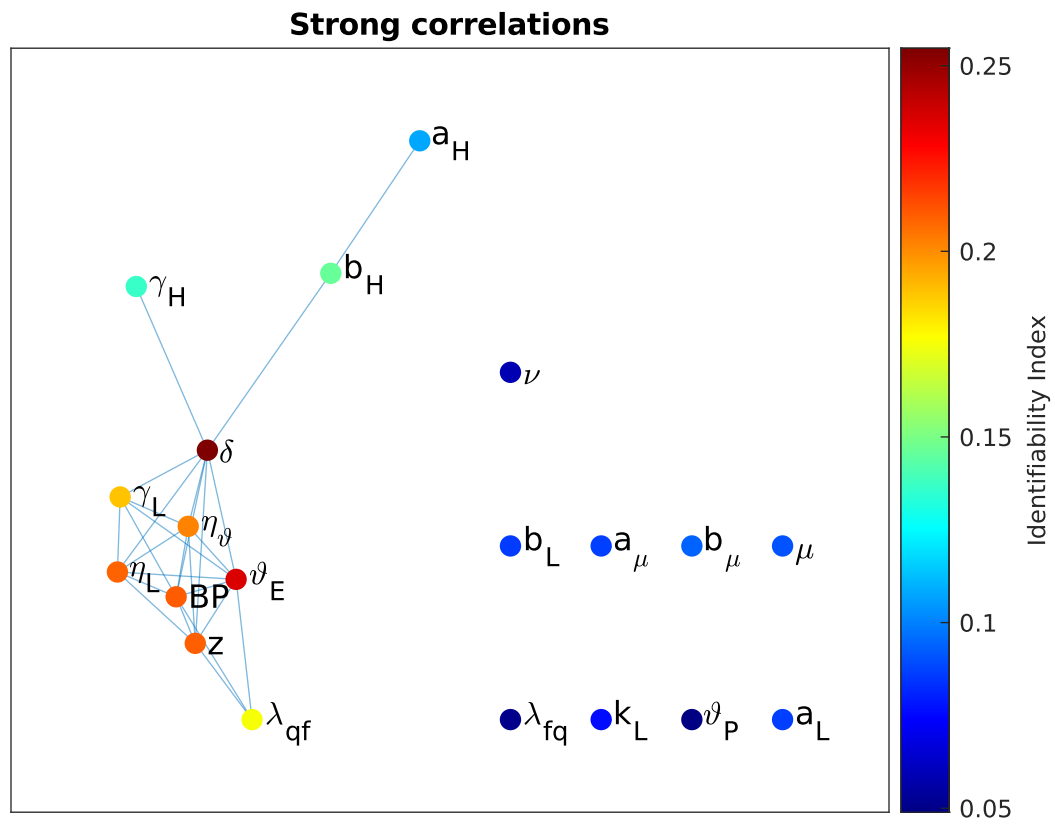
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0012'	'0.0001'	'0.0005'	'0.051'
\vartheta_E	'0.9218'	'1'	'0.9824'	'0.0004'	'0.2357'
\gamma_L	'0.9283'	'1'	'0.971'	'0.8671'	'0.1895'
k_L	'5.3151'	'5.8087'	'5.5619'	'6.3157'	'0.0765'
\lambda_{qf}	'0.2858'	'0.3752'	'0.3305'	'0.9827'	'0.1759'
\delta	'0.0806'	'0.0967'	'0.0887'	'0.1141'	'0.2547'
\eta_L	'0.8319'	'0.8912'	'0.8615'	'0.8659'	'0.2087'
\vartheta_P	'0'	'0.0015'	'0.0001'	'0.0001'	'0.0489'
\gamma_H	'0.6691'	'0.7536'	'0.7114'	'0.958'	'0.1371'
z	'26.418'	'28.0789'	'27.2484'	'29.9616'	'0.2092'
\eta_{\vartheta}	'0.8565'	'0.9154'	'0.8859'	'0.7851'	'0.2018'
a_L	'6.9672'	'7.5166'	'7.2419'	'14.523'	'0.0874'
b_L	'13.7763'	'14.5757'	'14.176'	'3.5679'	'0.0863'
a_{\mu}	'7.1921'	'8.006'	'7.599'	'11.564'	'0.0868'
b_{\mu}	'7.2885'	'8.2938'	'7.7912'	'3.897'	'0.0943'
\mu	'0.542'	'0.6136'	'0.5778'	'0.3896'	'0.0911'
a_H	'6.6558'	'7.5566'	'7.1062'	'4.3432'	'0.108'
b_H	'9.2577'	'10.4366'	'9.8472'	'14.0629'	'0.1466'
\nu	'0'	'1.1449'	'0.2101'	'1.9188'	'0.0594'
BP	'641.1269'	'643.8731'	'642.5'	'637.5'	'0.2105'

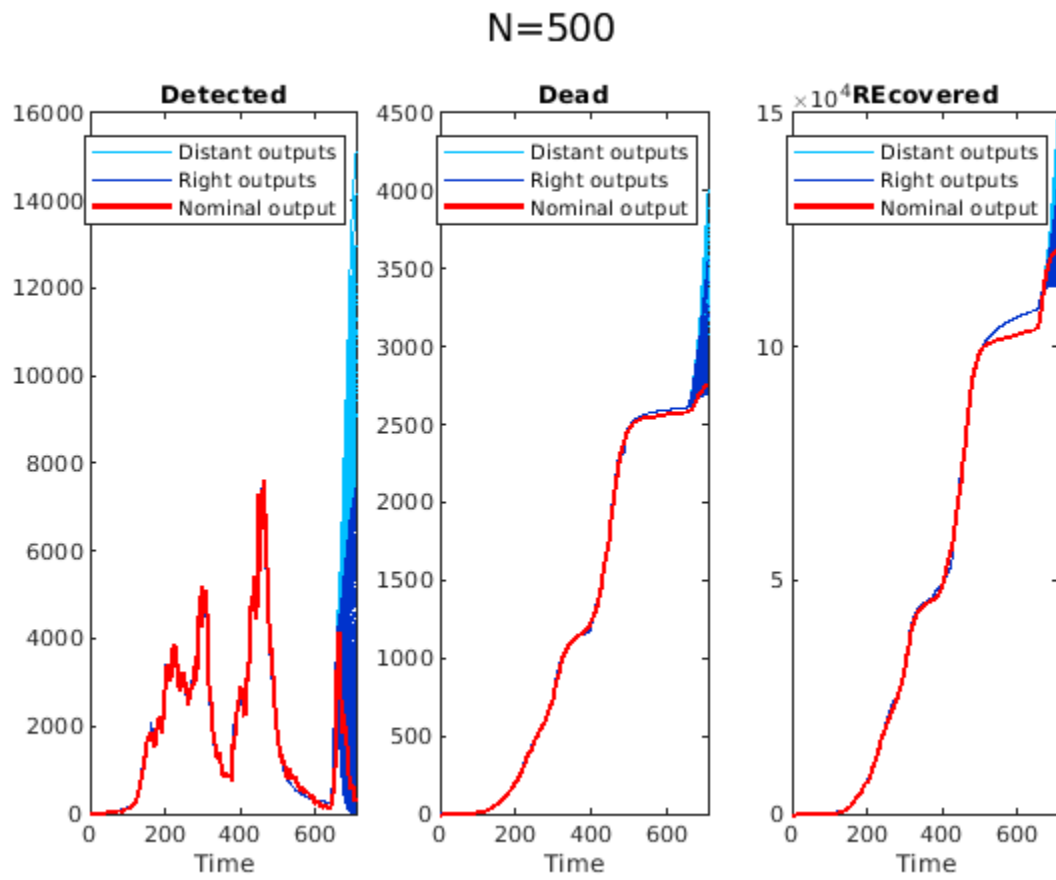
### 15.3. Identifiability analysis







## 15.4. Uncertainty analysis



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## Chapter 16. Extension number16

### 16.1. Basic information

The extension to be validated consists of the time series from the data709 to the 723. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

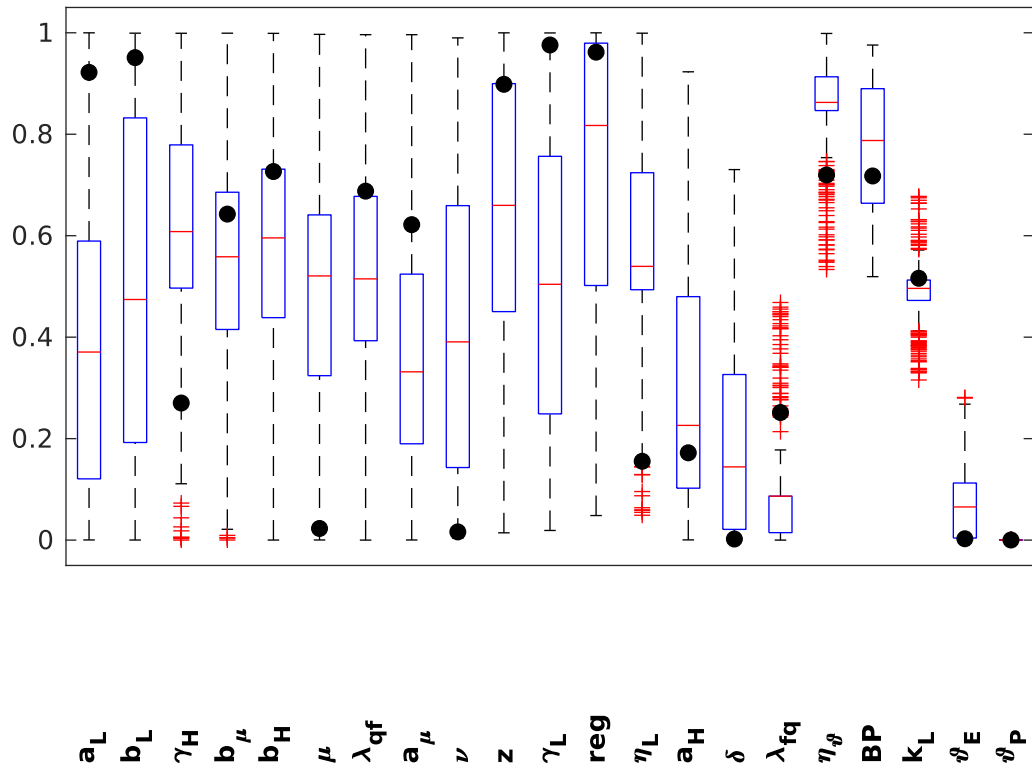
### 16.2. Estimated parameters with their intervals

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

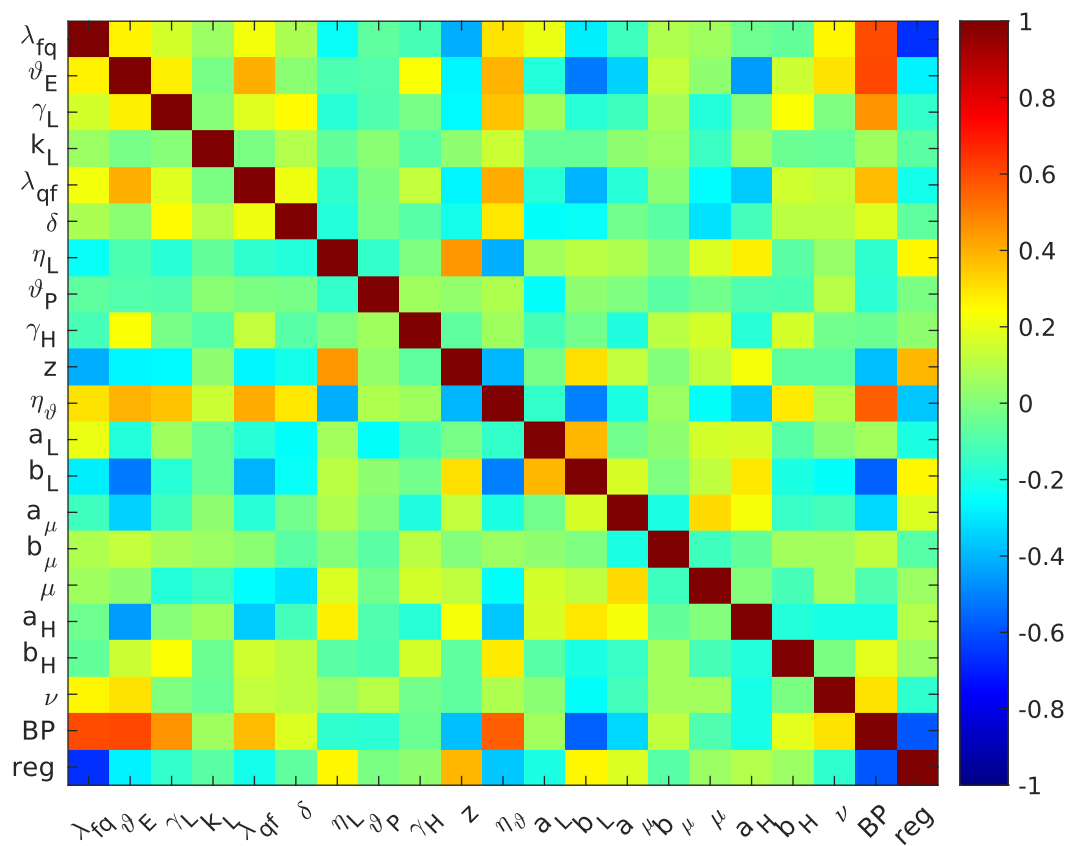
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

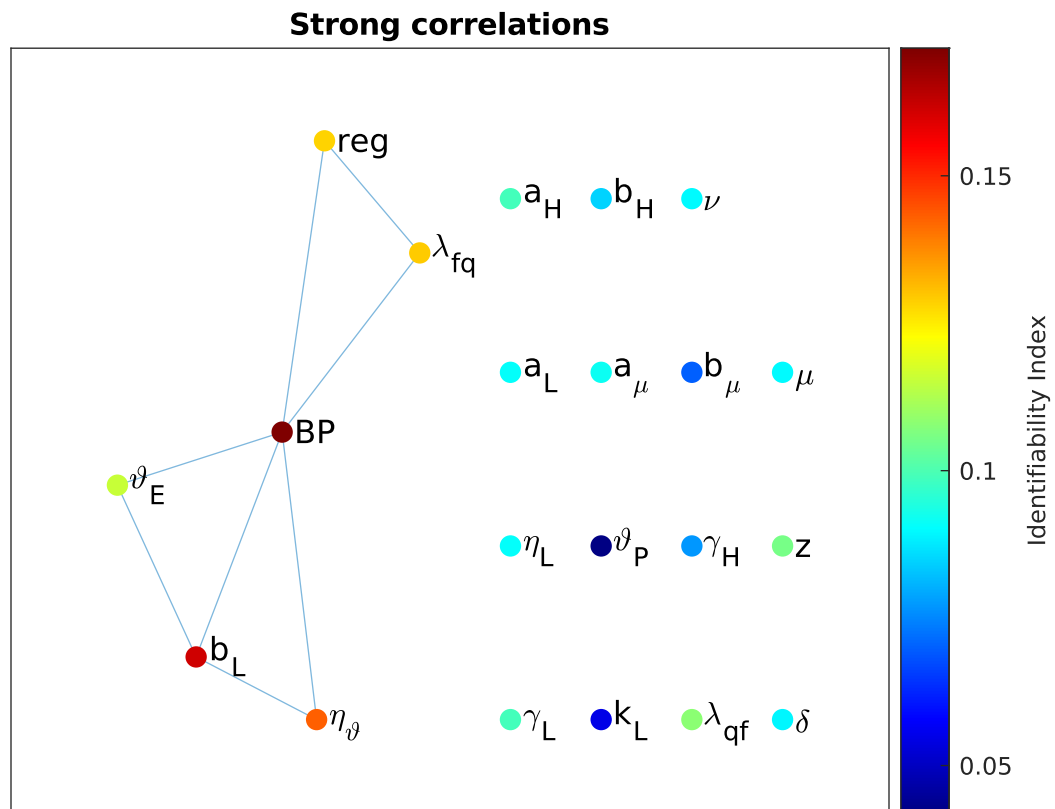
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0617'	'0.418'	'0.0866'	'0.2515'	'0.1294'
$\vartheta_E$	'0.0012'	'0.005'	'0.0653'	'0.0027'	'0.1158'
$\gamma_L$	'0.6468'	'1'	'0.5042'	'0.9759'	'0.099'
$k_L$	'1.225'	'10'	'5.4652'	'5.6449'	'0.0552'
$\lambda_{qf}$	'0.6439'	'0.9027'	'0.5149'	'0.6878'	'0.1083'
$\delta$	'0'	'0.0006'	'0.0216'	'0.0003'	'0.0893'
$\eta_L$	'0.1473'	'0.8472'	'0.5395'	'0.1554'	'0.0909'
$\vartheta_P$	'0.0002'	'0.0002'	'0.0003'	'0.0002'	'0.0421'
$\gamma_H$	'0.2295'	'0.9156'	'0.6081'	'0.2702'	'0.0773'
$z$	'8.6812'	'27.8734'	'19.7934'	'26.9532'	'0.1054'
$\eta_{\vartheta}$	'0.7163'	'0.7506'	'0.8628'	'0.7197'	'0.1429'
$a_L$	'12.1743'	'14.0047'	'6.1897'	'13.907'	'0.0909'
$b_L$	'11.7219'	'14.3599'	'7.6395'	'14.3138'	'0.1612'
$a_{\mu}$	'1.35'	'15'	'5.6435'	'9.7049'	'0.0919'
$b_{\mu}$	'2.1502'	'10.9118'	'8.8184'	'9.9963'	'0.0703'
$\mu$	'0'	'0.0421'	'0.5207'	'0.0229'	'0.0901'
$a_H$	'2.232'	'10.8429'	'4.1653'	'3.4091'	'0.0992'
$b_H$	'2.1665'	'13.6896'	'9.3392'	'11.1709'	'0.0848'
$\nu$	'6.013'	'12.8846'	'195.3634'	'8.0918'	'0.0897'
BP	'638.4852'	'662.9547'	'673.5'	'660.4998'	'0.1716'
reg	'0.1888'	'0.2409'	'0.2043'	'0.2404'	'0.1285'

### 16.3. Identifiability analysis









## 16.4. Uncertainty analysis

N=500

