

# **Validation process forAMAZONAS**

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

The number of estimations needed to perform the validation was 1000.

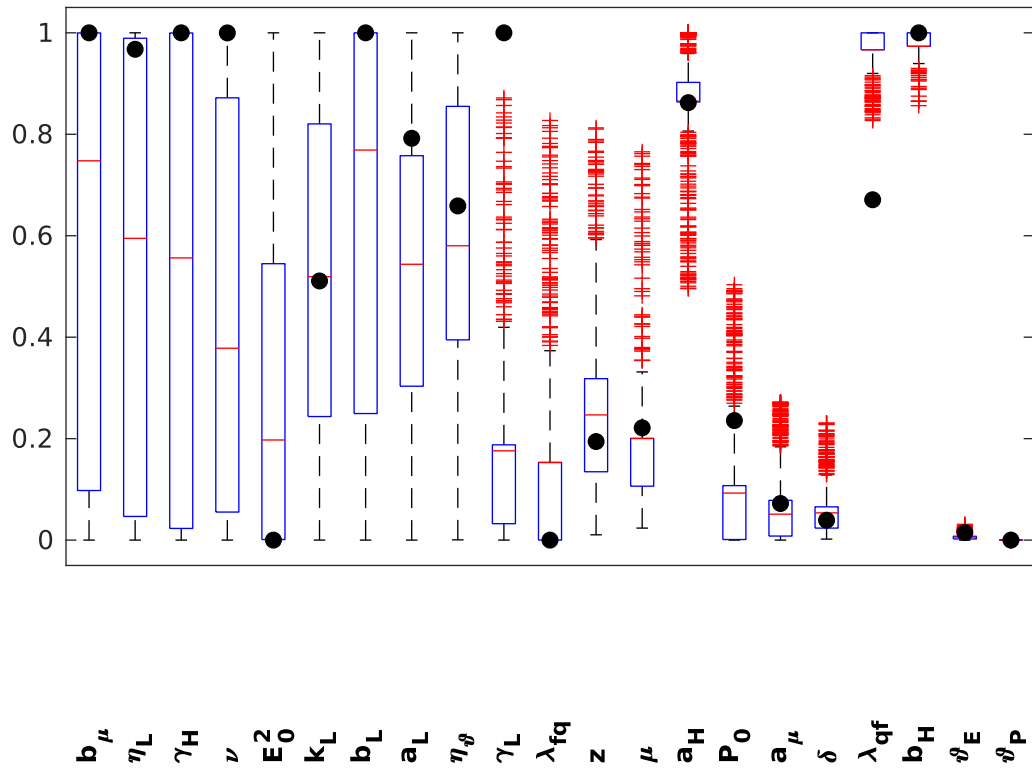
### 1.2. Estimated parameters with their intervals

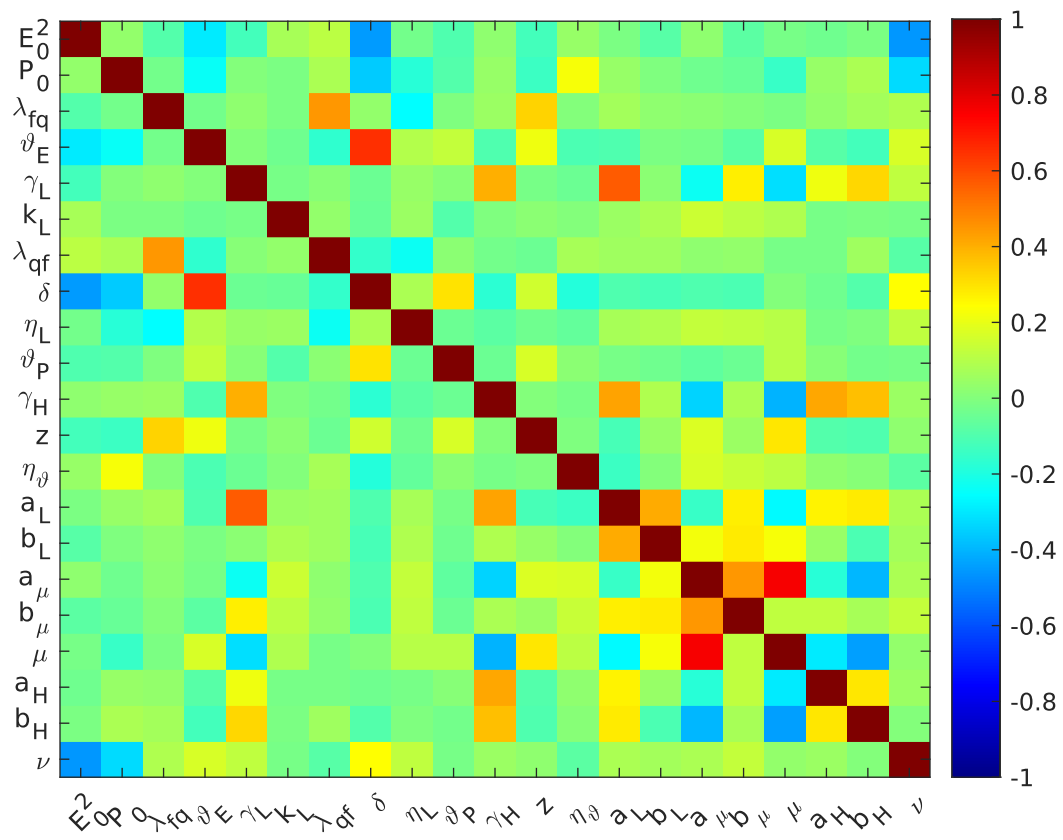
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

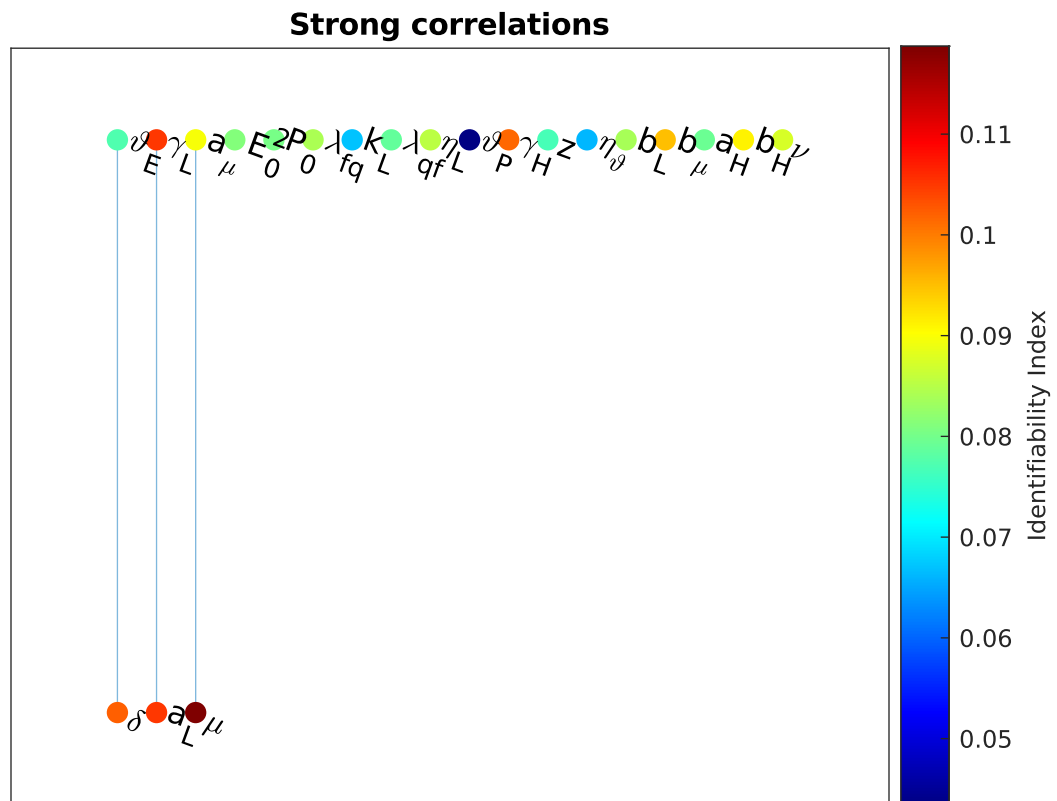
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$E^2_0$	'0.0002'	'0.0055'	'394.726'	'0.0027'	'0.0814'
$P_0$	'94.151'	'125.9353'	'37.0619'	'94.2604'	'0.0803'
$\lambda_{fq}$	'0'	'0'	'0.1531'	'0'	'0.0841'
$\vartheta_E$	'0.0104'	'0.0163'	'0.0059'	'0.0148'	'0.0774'
$\gamma_L$	'0.6463'	'1'	'0.1761'	'1'	'0.1051'
$k_L$	'1'	'9.1225'	'5.6736'	'5.5977'	'0.067'
$\lambda_{qf}$	'0'	'1'	'0.9666'	'0.6709'	'0.0788'
$\delta$	'0.004'	'0.006'	'0.008'	'0.0059'	'0.1022'
$\eta_L$	'0.2006'	'1'	'0.5948'	'0.9676'	'0.0853'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0435'
$\gamma_H$	'0'	'1'	'0.5562'	'1'	'0.1016'
$z$	'4.6586'	'5.9015'	'7.4045'	'5.8279'	'0.0768'
$\eta_{\vartheta}$	'0.6138'	'0.6591'	'0.5802'	'0.6588'	'0.0664'
$a_L$	'11.2748'	'12.1808'	'8.6128'	'12.0893'	'0.1051'
$b_L$	'13.2155'	'15'	'11.7648'	'15'	'0.0839'
$a_{\mu}$	'1'	'2.5023'	'1.7156'	'2.0095'	'0.0898'
$b_{\mu}$	'7.0917'	'15'	'11.4679'	'14.9999'	'0.0951'
$\mu$	'0.1983'	'0.3234'	'0.2004'	'0.2213'	'0.1187'
$a_H$	'9.3787'	'14.4117'	'13.1162'	'13.0727'	'0.0796'
$b_H$	'4.1136'	'15'	'14.6273'	'15'	'0.0913'
$\nu$	'238.0747'	'500'	'189.1156'	'499.9239'	'0.0874'

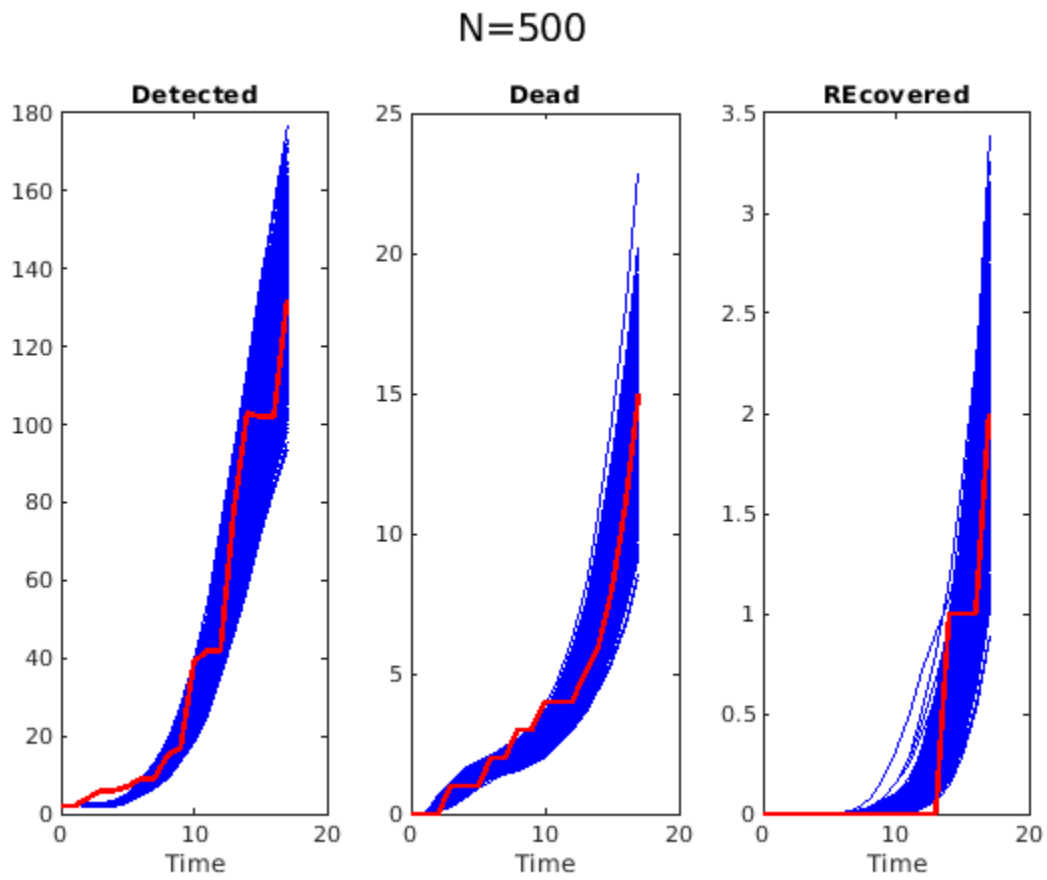
### 1.3. Identifiability analysis







## 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 data18 to the 46. The status of the validation is: COMPLETED.

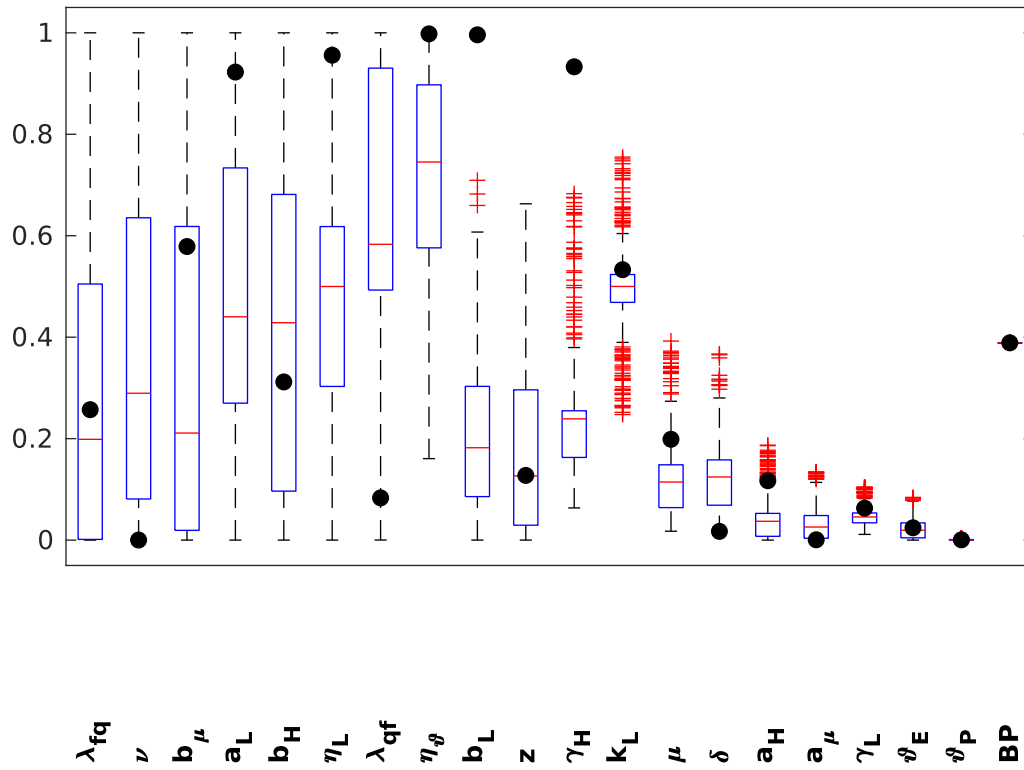
The number of estimations needed to perform the validation was1000.

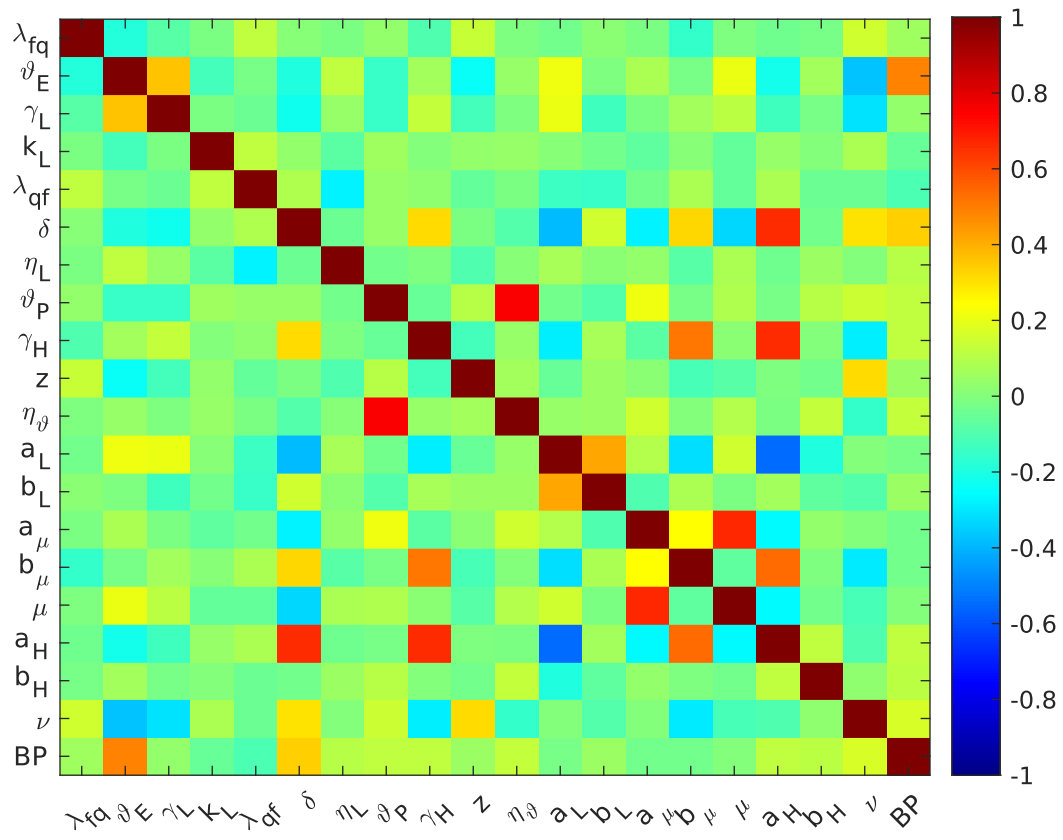
### 2.2. Estimated parameters with their intervals

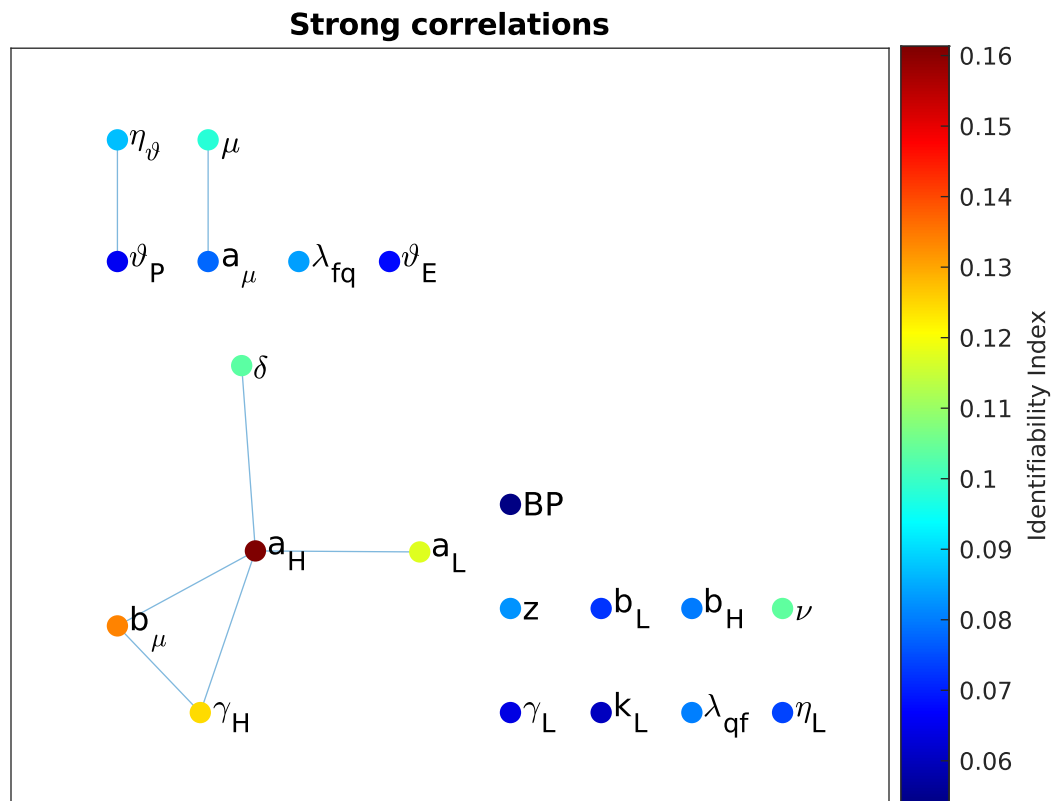
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1545'	'0.2428'	'0.1986'	'0.2571'	'0.0839'
$\vartheta_E$	'0.016'	'0.0229'	'0.0194'	'0.0243'	'0.0679'
$\gamma_L$	'0.0339'	'0.0573'	'0.0456'	'0.063'	'0.0641'
$k_L$	'5.2795'	'5.7217'	'5.5006'	'5.7972'	'0.0605'
$\lambda_{qf}$	'0.5467'	'0.6196'	'0.5831'	'0.0832'	'0.0806'
$\delta$	'0.016'	'0.0214'	'0.0187'	'0.0026'	'0.1037'
$\eta_L$	'0.4655'	'0.5344'	'0.5'	'0.9559'	'0.0743'
$\vartheta_P$	'0.0004'	'0.0008'	'0.0006'	'0.0006'	'0.0657'
$\gamma_H$	'0.2003'	'0.2777'	'0.239'	'0.9331'	'0.1247'
$z$	'2.704'	'4.8966'	'3.8003'	'3.8266'	'0.0828'
$\eta_{\vartheta}$	'0.7189'	'0.7718'	'0.7454'	'0.998'	'0.0871'
$a_L$	'6.6042'	'7.7209'	'7.1625'	'13.9174'	'0.1175'
$b_L$	'3.1719'	'3.9261'	'3.549'	'14.9446'	'0.0724'
$a_{\mu}$	'1.2181'	'1.5029'	'1.3605'	'1.0088'	'0.0779'
$b_{\mu}$	'3.3023'	'4.6071'	'3.9547'	'9.1023'	'0.1337'
$\mu$	'0.0843'	'0.1446'	'0.1145'	'0.1987'	'0.0982'
$a_H$	'1'	'2.045'	'1.5195'	'2.639'	'0.1613'
$b_H$	'6.4196'	'7.5799'	'6.9998'	'5.3653'	'0.08'
$\nu$	'123.7064'	'165.8113'	'144.7588'	'0.06'	'0.1041'
BP	'18.4028'	'18.5972'	'18.5'	'18.5'	'0.0538'

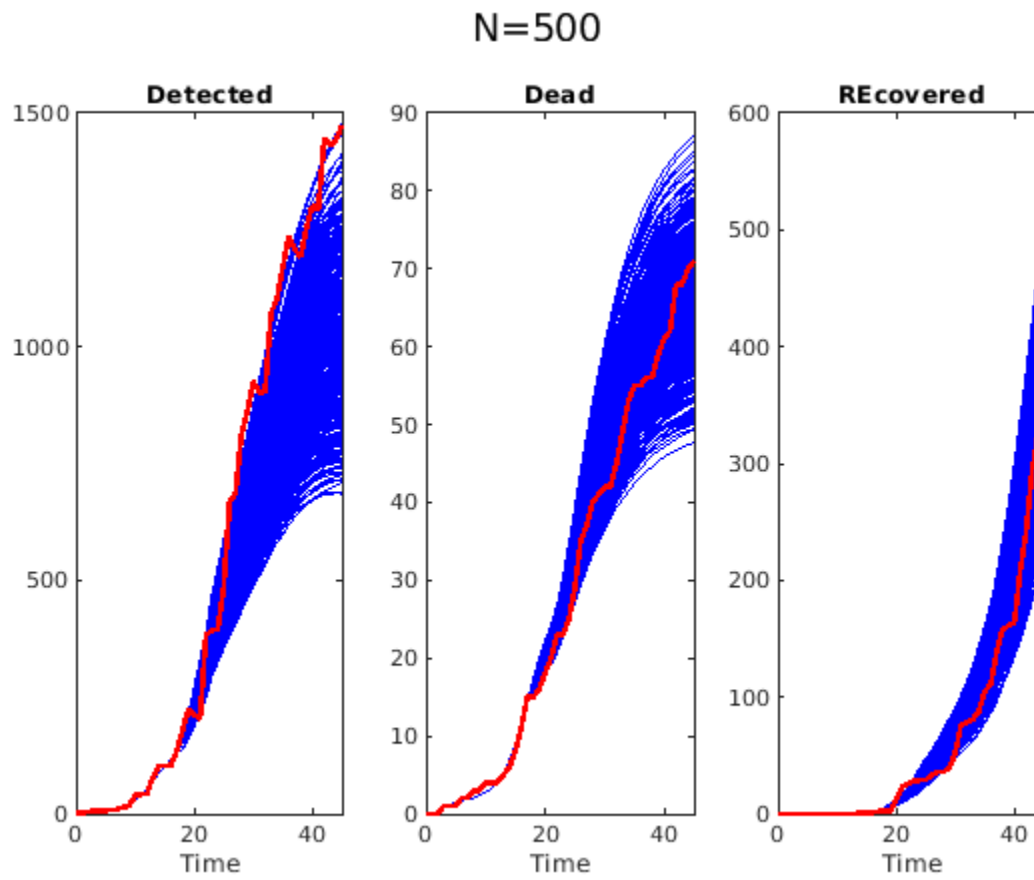
## 2.3. Identifiability analysis







## 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 data46 to the 69. The status of the validation is: COMPLETED.

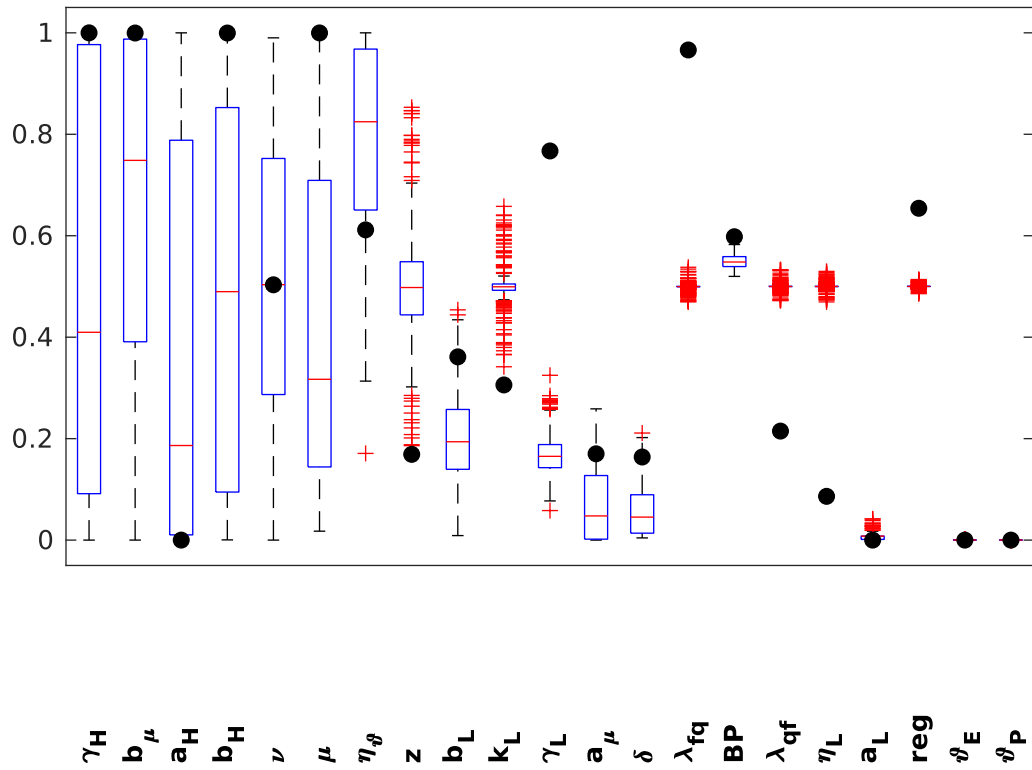
The number of estimations needed to perform the validation was1000.

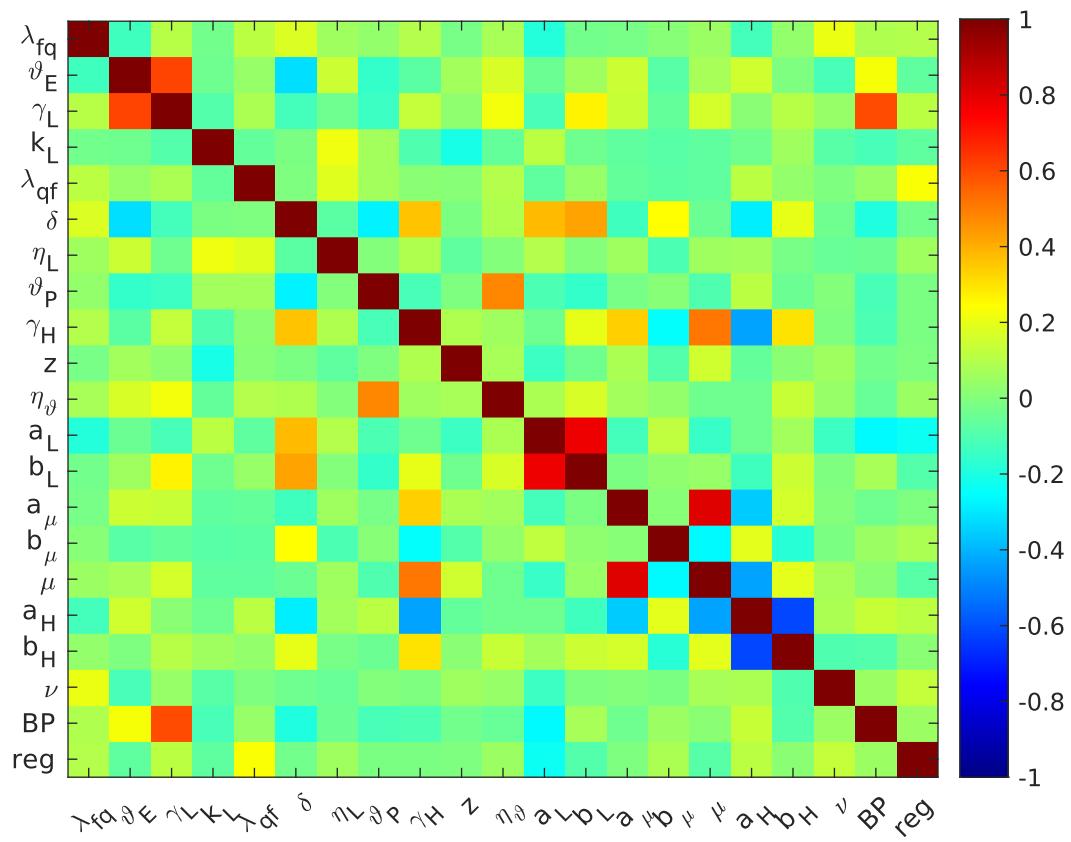
### 3.2. Estimated parameters with their intervals

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

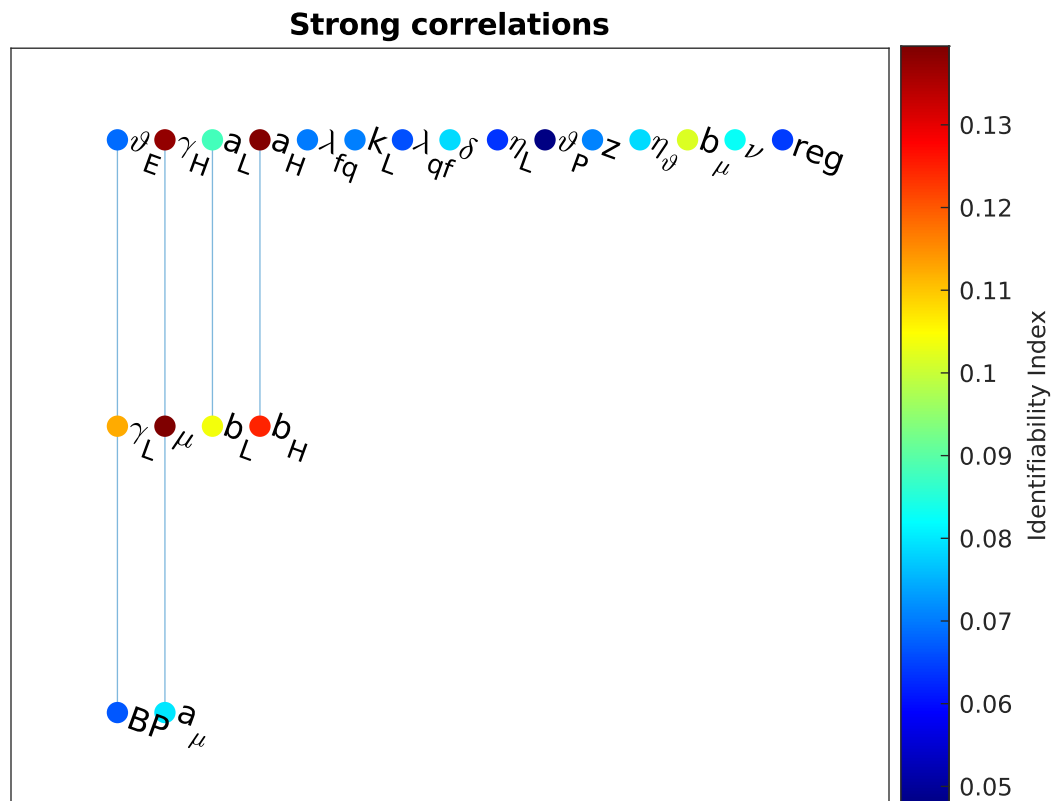
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.473'	'0.5264'	'0.4997'	'0.9662'	'0.0703'
$\vartheta_E$	'0'	'0.0015'	'0.0001'	'0'	'0.0689'
$\gamma_L$	'0.1384'	'0.1927'	'0.1656'	'0.7671'	'0.1125'
$k_L$	'5.2433'	'5.7451'	'5.4942'	'3.7531'	'0.0707'
$\lambda_{qf}$	'0.4746'	'0.5254'	'0.5'	'0.2149'	'0.0663'
$\delta$	'0.0046'	'0.009'	'0.0068'	'0.0246'	'0.079'
$\eta_L$	'0.4771'	'0.523'	'0.5'	'0.0863'	'0.0638'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0478'
$\gamma_H$	'0.3473'	'0.4721'	'0.4097'	'1'	'0.1375'
$z$	'13.9662'	'15.9084'	'14.9373'	'5.0721'	'0.0709'
$\eta_{\vartheta}$	'0.7937'	'0.8558'	'0.8247'	'0.6116'	'0.079'
$a_L$	'1'	'1.379'	'1.1105'	'1'	'0.0881'
$b_L$	'3.2203'	'4.2274'	'3.7238'	'6.0568'	'0.1041'
$a_{\mu}$	'1.4889'	'1.8463'	'1.6676'	'3.3817'	'0.0798'
$b_{\mu}$	'10.715'	'12.2449'	'11.4799'	'14.9947'	'0.1018'
$\mu$	'0.2652'	'0.3688'	'0.317'	'0.9998'	'0.1395'
$a_H$	'2.753'	'4.4678'	'3.6104'	'1.0002'	'0.1388'
$b_H$	'7.0327'	'8.6809'	'7.8568'	'14.9945'	'0.1245'
$\nu$	'229.5342'	'273.9748'	'251.7545'	'251.6453'	'0.0826'
BP	'45.8162'	'46.1026'	'45.9594'	'48.4999'	'0.0668'
reg	'0.1194'	'0.1306'	'0.125'	'0.1635'	'0.0644'

### 3.3. Identifiability analysis

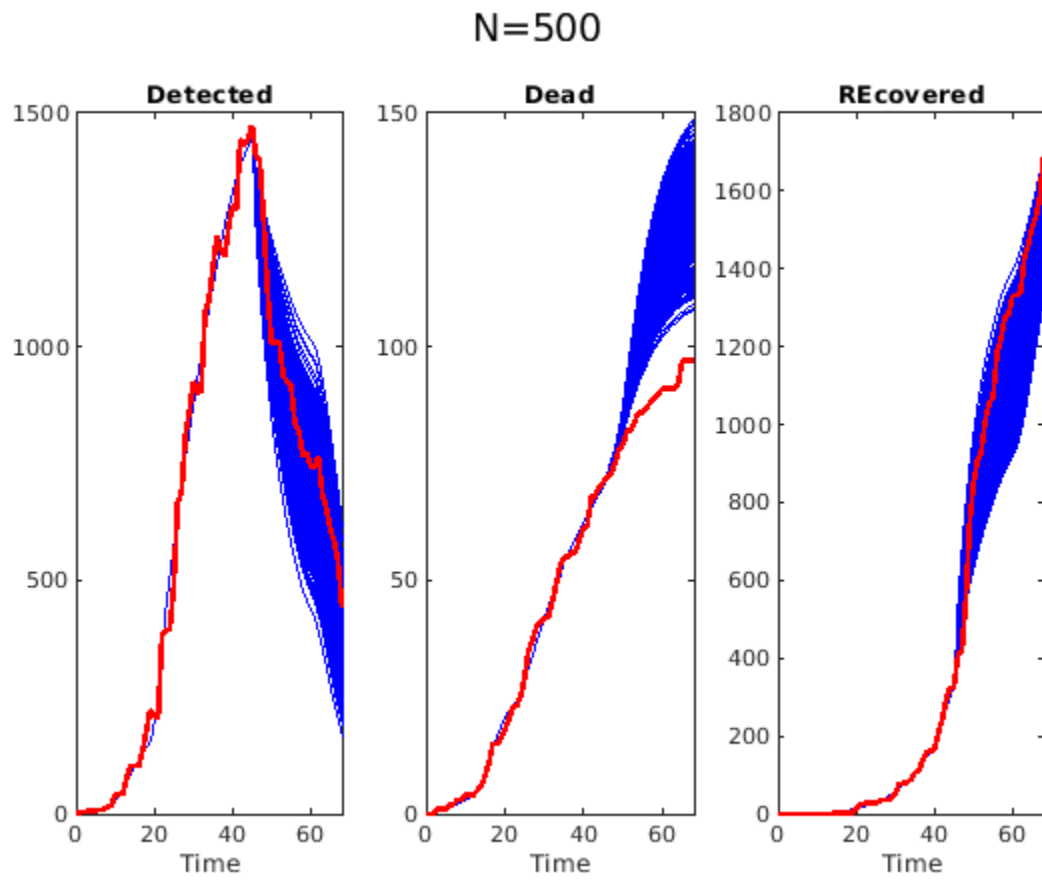








### 3.4. Uncertainty analysys



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## Chapter 4. Extension number4

### 4.1. Basic information

The extension to be validated consists of the time series from the data69 to the 97. The status of the validation is: COMPLETED.

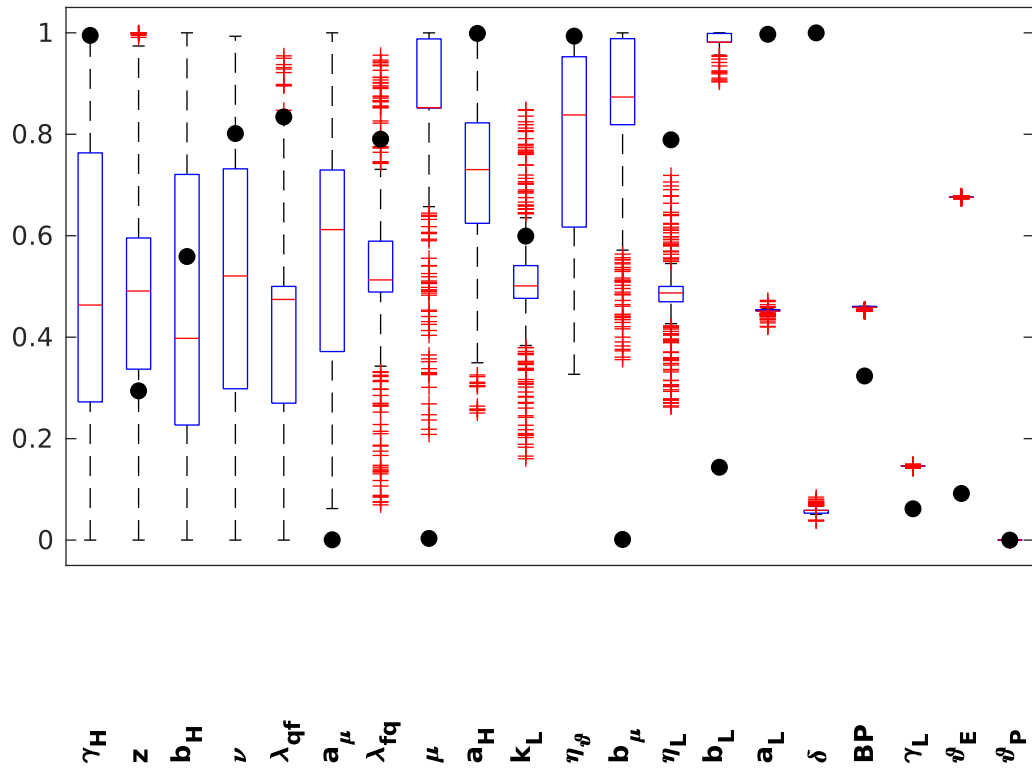
The number of estimations needed to perform the validation was1000.

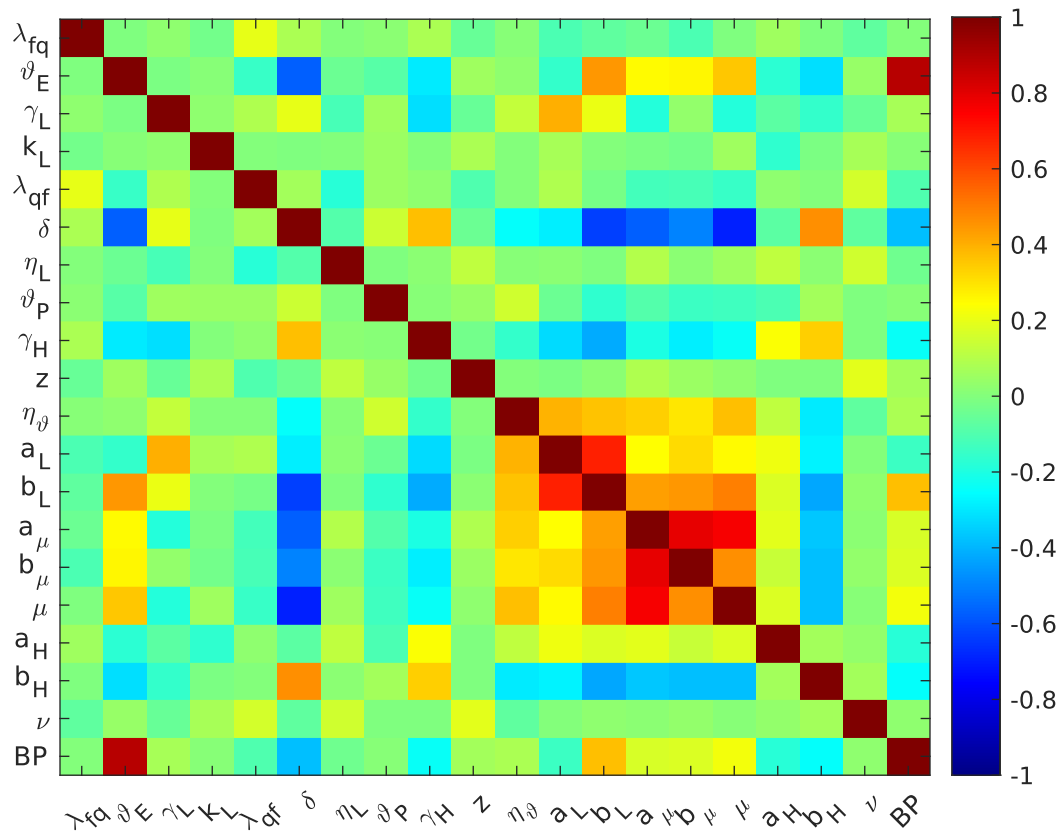
### 4.2. Estimated parameters with their intervals

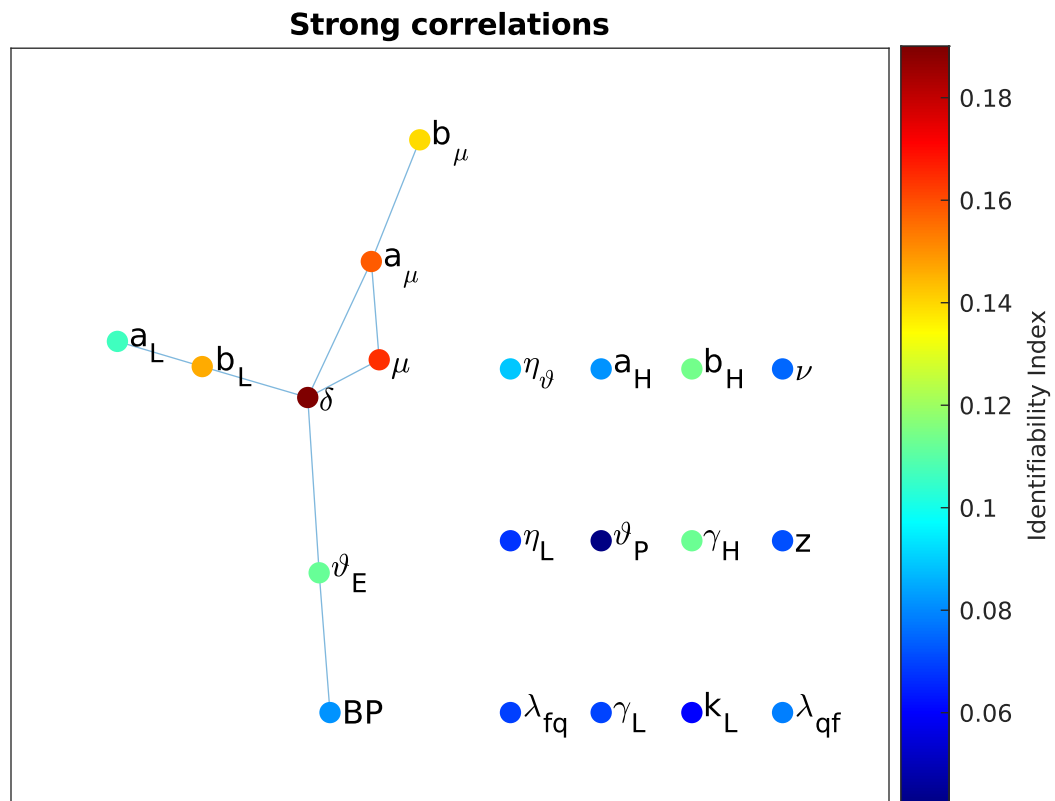
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.4799'	'0.5459'	'0.5129'	'0.7903'	'0.0699'
$\vartheta_E$	'0.6649'	'0.6867'	'0.6758'	'0.0919'	'0.1124'
$\gamma_L$	'0.1311'	'0.161'	'0.1461'	'0.0617'	'0.0699'
$k_L$	'5.2638'	'5.7572'	'5.5105'	'6.3937'	'0.0605'
$\lambda_{qf}$	'0.4408'	'0.5079'	'0.4744'	'0.8342'	'0.0788'
$\delta$	'0.0018'	'0.0158'	'0.0088'	'0.15'	'0.1901'
$\eta_L$	'0.4583'	'0.5162'	'0.4872'	'0.7891'	'0.0678'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0421'
$\gamma_H$	'0.4204'	'0.5064'	'0.4634'	'0.9949'	'0.1128'
$z$	'13.716'	'15.7439'	'14.73'	'8.8264'	'0.0719'
$\eta_{\vartheta}$	'0.8118'	'0.8644'	'0.8381'	'0.9935'	'0.0895'
$a_L$	'7.0577'	'7.5872'	'7.3224'	'14.9596'	'0.1068'
$b_L$	'14.1826'	'15'	'14.7418'	'3.0103'	'0.1466'
$a_{\mu}$	'9.1063'	'10.033'	'9.5697'	'1.0088'	'0.1577'
$b_{\mu}$	'12.6005'	'13.8557'	'13.2281'	'1.0182'	'0.1394'
$\mu$	'0.8012'	'0.9038'	'0.8525'	'0.0033'	'0.1642'
$a_H$	'10.8369'	'11.6132'	'11.225'	'14.9842'	'0.0816'
$b_H$	'5.9965'	'7.1395'	'6.568'	'8.8263'	'0.1143'
$\nu$	'242.127'	'278.5924'	'260.3597'	'400.741'	'0.0753'
BP	'69.2917'	'69.5191'	'69.4054'	'62.5'	'0.082'

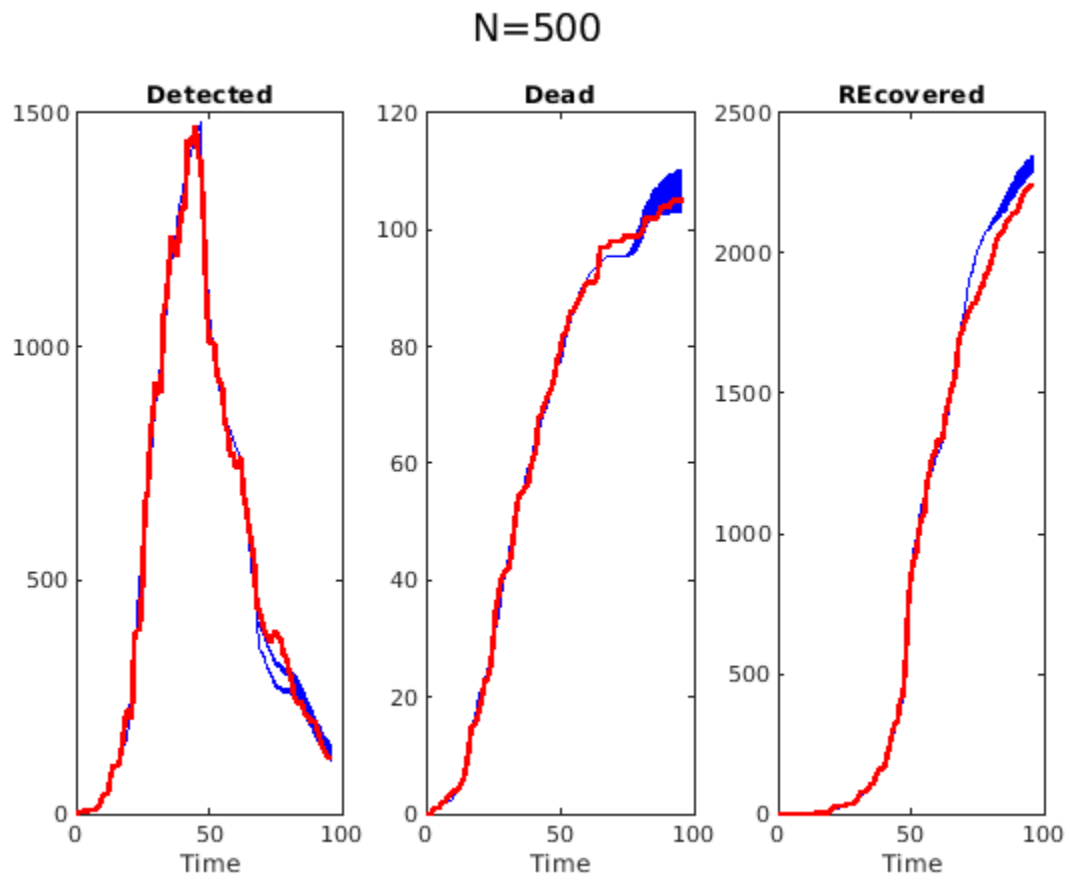
### 4.3. Identifiability analysis







#### 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 data97 to the 127. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

### 5.2. Estimated parameters with their intervals

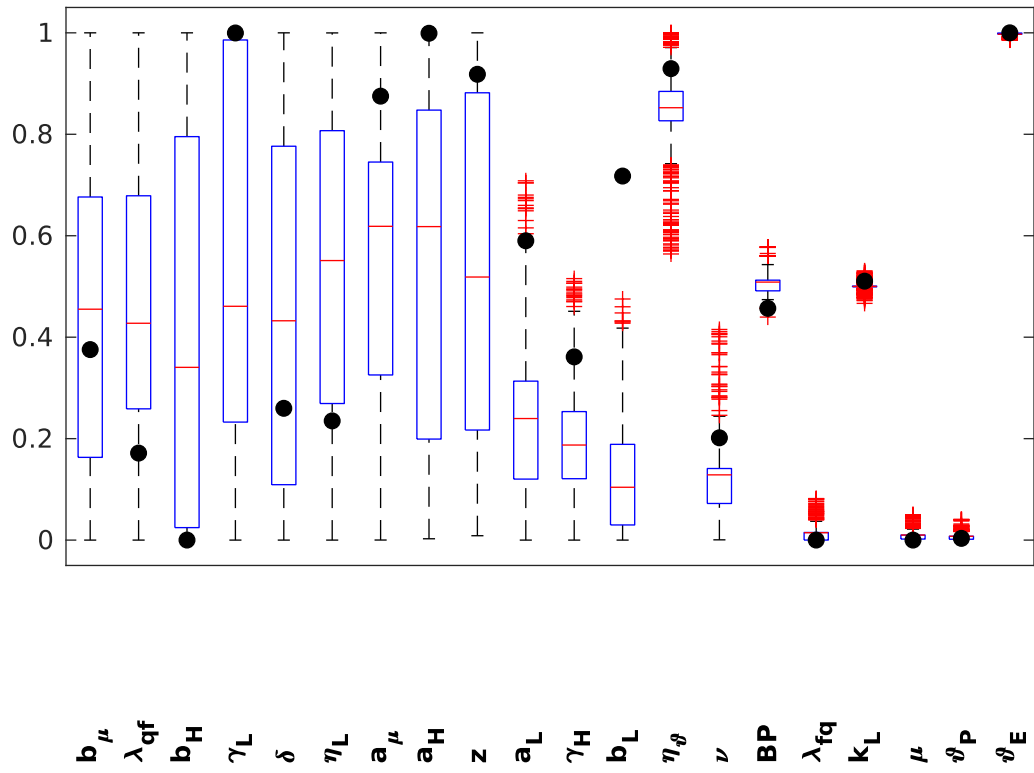
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

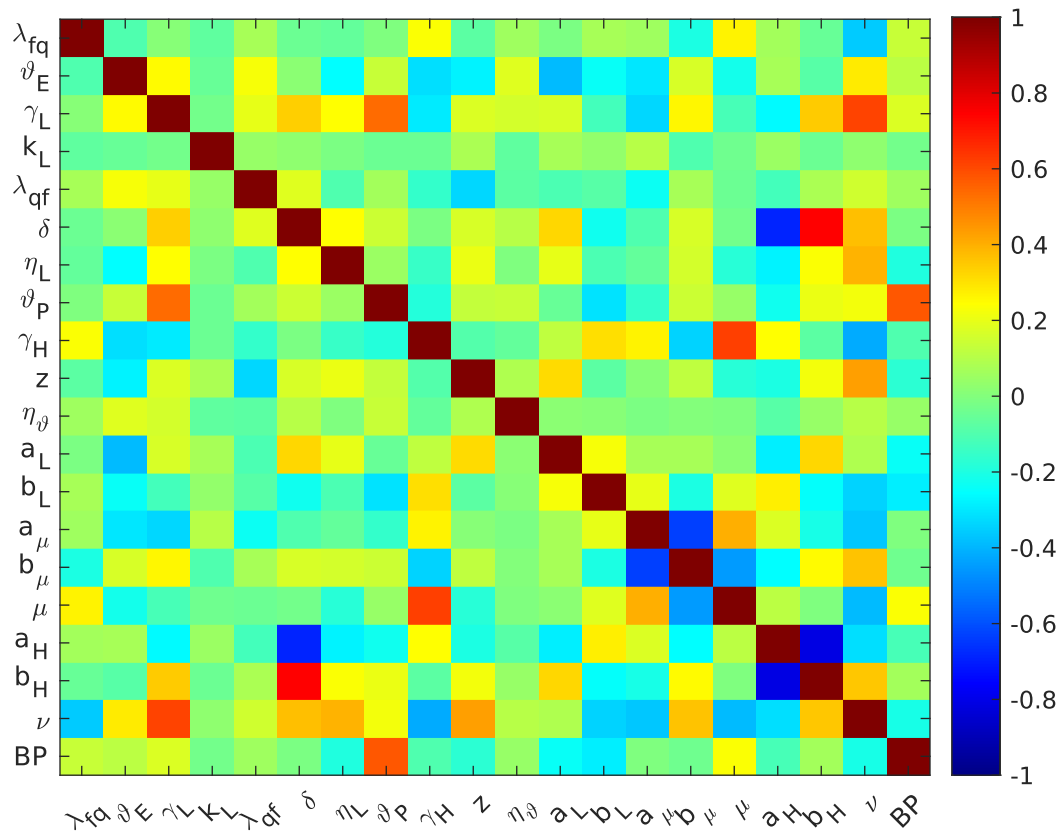
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

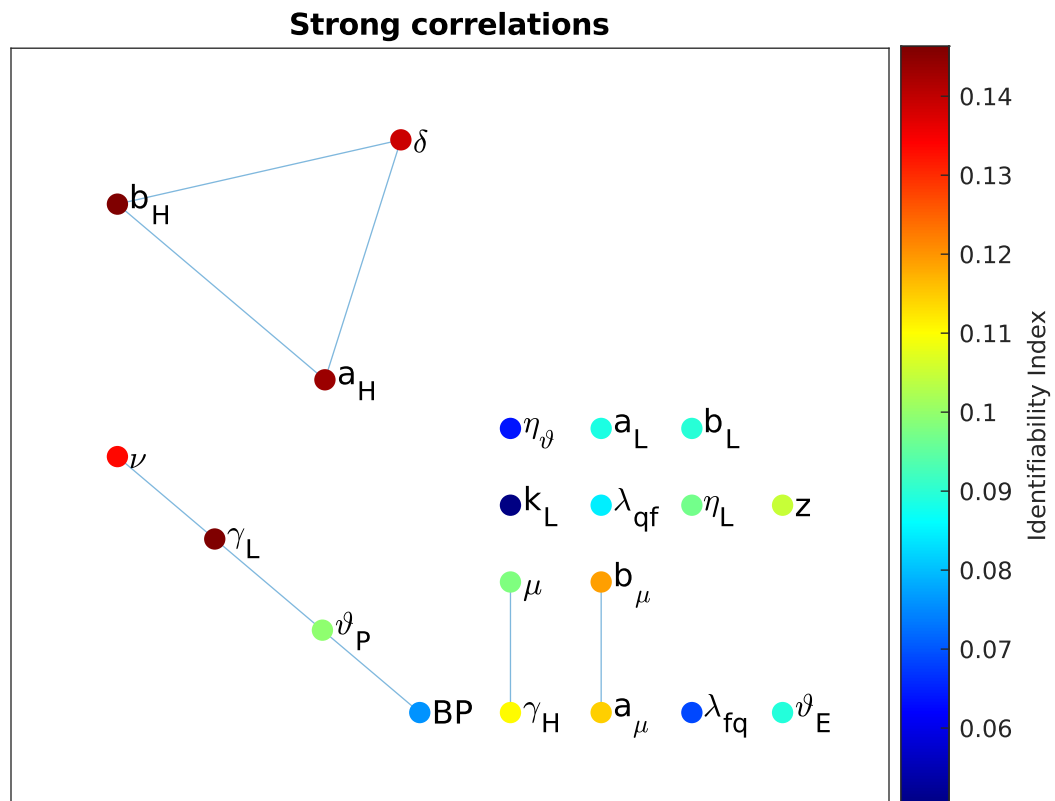
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0001'	'0.0002'	'0.015'	'0.0001'	'0.0688'
$\vartheta_E$	'0.9757'	'1'	'0.9972'	'1'	'0.0896'
$\gamma_L$	'0.4905'	'1'	'0.4609'	'0.9997'	'0.1461'
$k_L$	'1.4005'	'10'	'5.5003'	'5.5942'	'0.0504'
$\lambda_{qf}$	'0.1672'	'0.265'	'0.4275'	'0.1715'	'0.0845'
$\delta$	'0.006'	'0.0774'	'0.0649'	'0.039'	'0.139'
$\eta_L$	'0.2223'	'0.2433'	'0.5511'	'0.235'	'0.097'
$\vartheta_P$	'0.001'	'0.0047'	'0.0076'	'0.0034'	'0.0996'
$\gamma_H$	'0'	'0.6601'	'0.1874'	'0.3612'	'0.1103'
$z$	'20.7368'	'27.8508'	'15.5581'	'27.5486'	'0.1051'
$\eta_{\vartheta}$	'0.7857'	'0.9576'	'0.8523'	'0.9294'	'0.0641'
$a_L$	'6.4357'	'9.9927'	'4.3576'	'9.2608'	'0.0887'
$b_L$	'8.1541'	'11.0971'	'2.4595'	'11.0473'	'0.09'
$a_{\mu}$	'2.9913'	'14.441'	'9.66'	'13.2523'	'0.1146'
$b_{\mu}$	'1.63'	'12.6616'	'7.3726'	'6.2578'	'0.1191'
$\mu$	'0'	'0.0001'	'0.01'	'0'	'0.098'
$a_H$	'4.794'	'15'	'9.652'	'14.9879'	'0.1433'
$b_H$	'1'	'11.773'	'5.7675'	'1.0011'	'0.1463'
$\nu$	'88.9836'	'104.1589'	'64.347'	'100.8244'	'0.1335'
BP	'92.672'	'96.4699'	'98.5'	'95.5'	'0.0759'



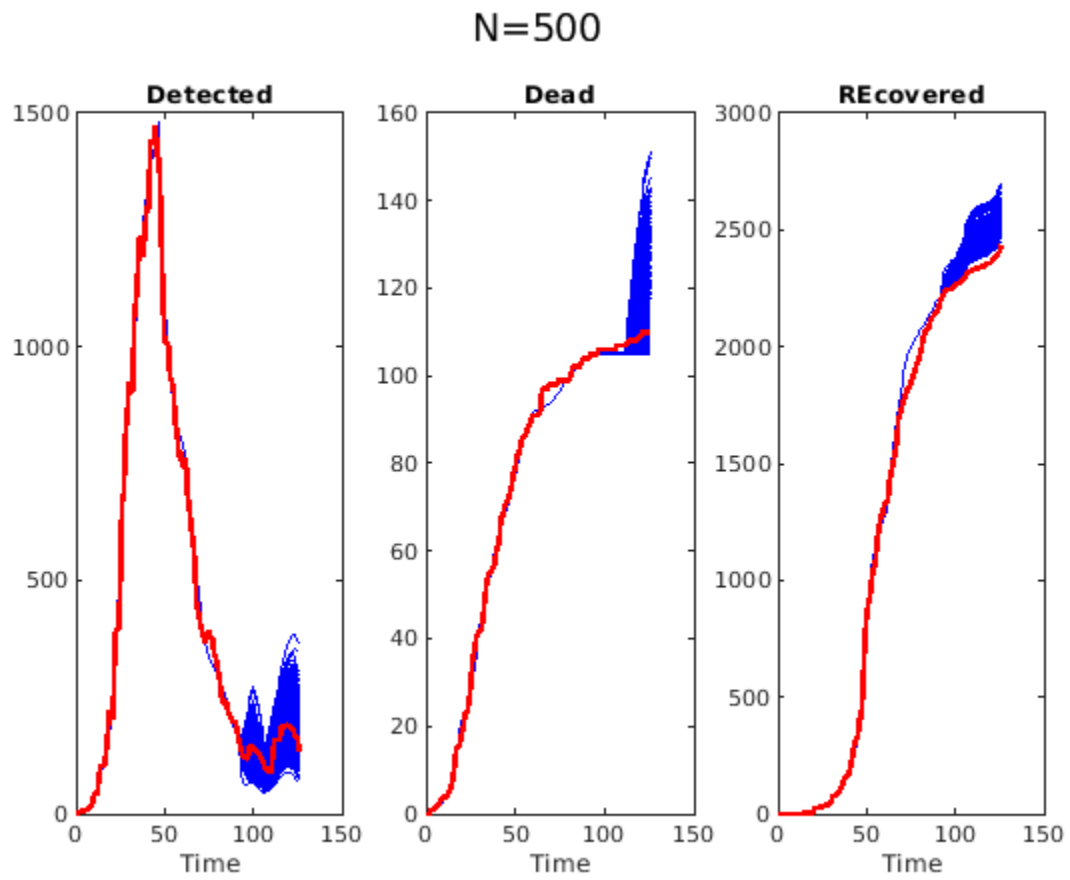
### 5.3. Identifiability analysis







## 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 data127 to the 191. The status of the validation is: COMPLETED.

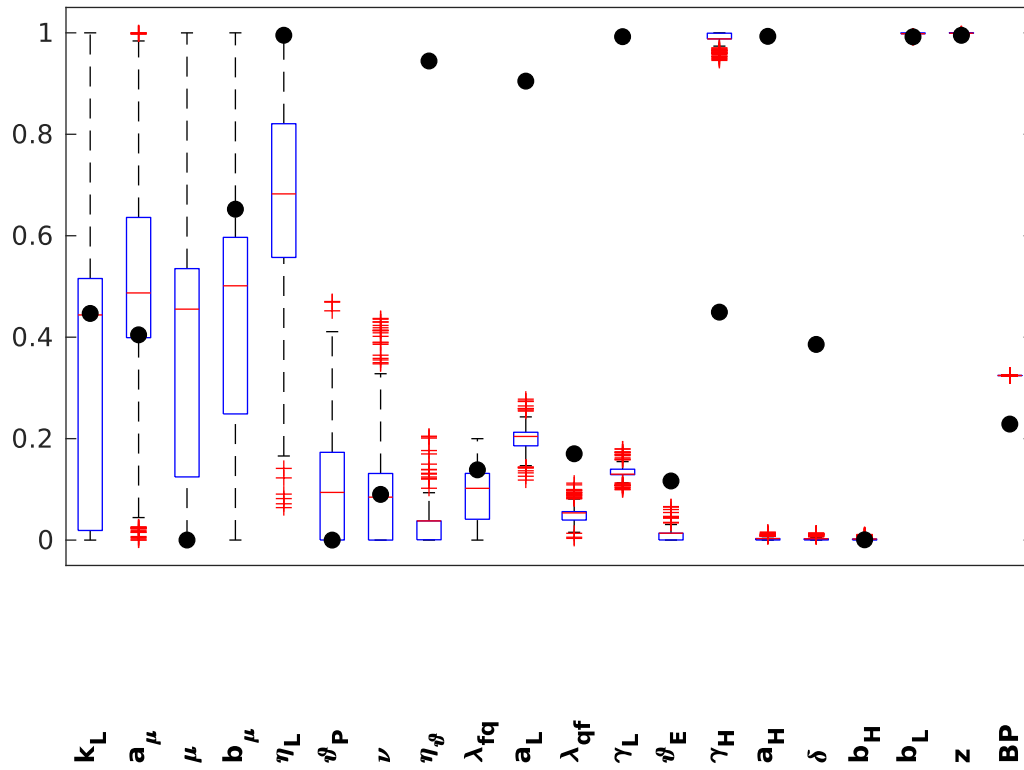
The number of estimations needed to perform the validation was1000.

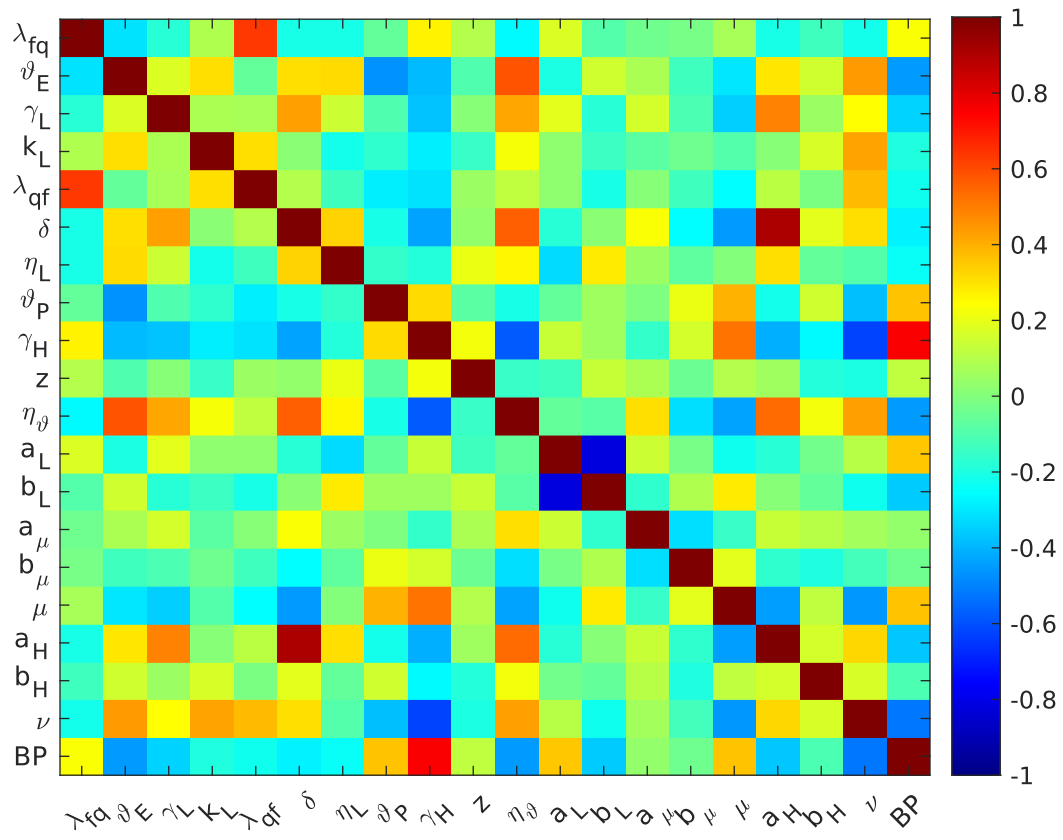
### 6.2. Estimated parameters with their intervals

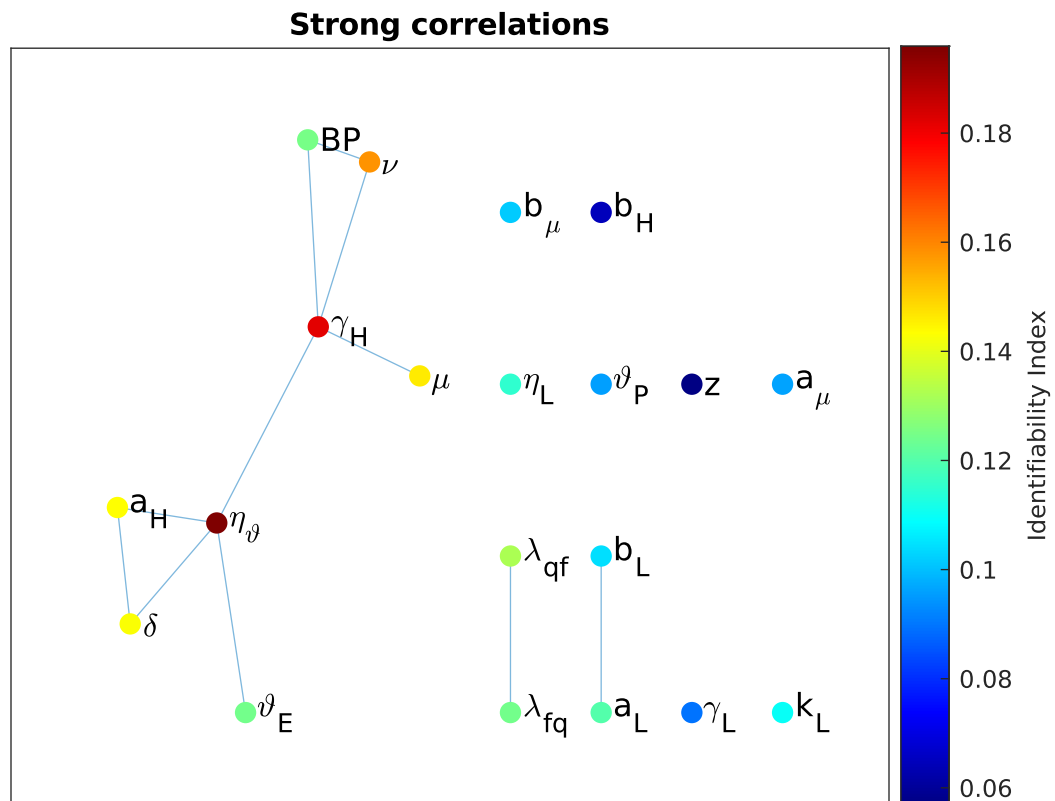
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0587'	'0.1454'	'0.1021'	'0.1385'	'0.1244'
$\vartheta_E$	'0'	'0.0435'	'0.0136'	'0.1166'	'0.1245'
$\gamma_L$	'0.1162'	'0.1438'	'0.13'	'0.9924'	'0.0898'
$k_L$	'4.5665'	'5.4232'	'4.9949'	'5.0214'	'0.1101'
$\lambda_{qf}$	'0.0016'	'0.1056'	'0.0536'	'0.1702'	'0.1322'
$\delta$	'0'	'0.0074'	'0.0004'	'0.0579'	'0.143'
$\eta_L$	'0.6368'	'0.7282'	'0.6825'	'0.9952'	'0.1151'
$\vartheta_P$	'0.0713'	'0.1167'	'0.094'	'0'	'0.0958'
$\gamma_H$	'0.947'	'1'	'0.988'	'0.4494'	'0.1818'
$z$	'29.68'	'30'	'29.9778'	'29.8533'	'0.057'
$\eta_{\vartheta}$	'0'	'0.0868'	'0.0378'	'0.9445'	'0.1959'
$a_L$	'3.2959'	'4.4256'	'3.8608'	'13.6671'	'0.1202'
$b_L$	'14.3119'	'15'	'14.9744'	'14.8898'	'0.1045'
$a_{\mu}$	'7.2297'	'8.4131'	'7.8214'	'6.6651'	'0.0963'
$b_{\mu}$	'7.3958'	'8.6409'	'8.0184'	'10.1324'	'0.1019'
$\mu$	'0.4113'	'0.4992'	'0.4553'	'0.0001'	'0.1463'
$a_H$	'1'	'1.7568'	'1.042'	'14.903'	'0.1436'
$b_H$	'1'	'1.2287'	'1.0302'	'1.0085'	'0.0649'
$\nu$	'23.9991'	'60.6641'	'42.3316'	'45.0481'	'0.1584'
BP	'127.2265'	'127.7735'	'127.5'	'118.5'	'0.1251'

### 6.3. Identifiability analysis

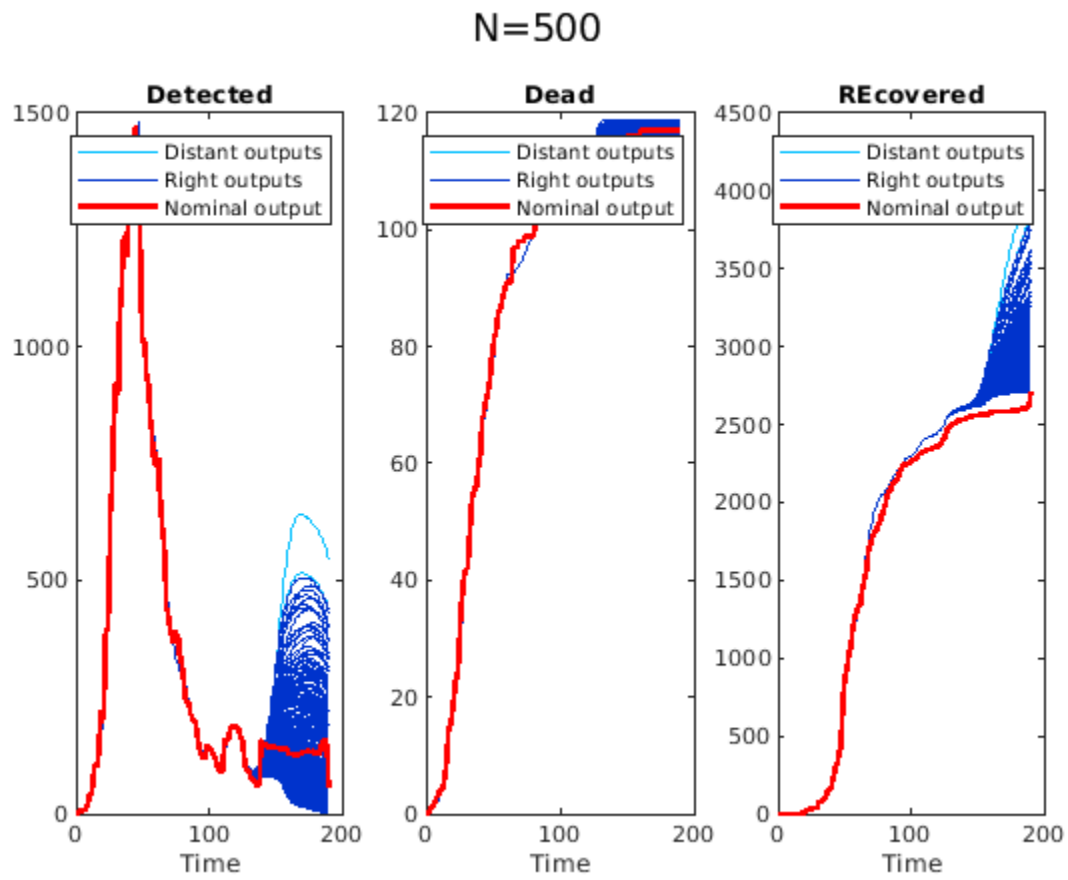








## 6.4. Uncertainty analysis



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## Chapter 7. Extension number7

### 7.1. Basic information

The extension to be validated consists of the time series from the data191 to the 223. The status of the validation is: COMPLETED.

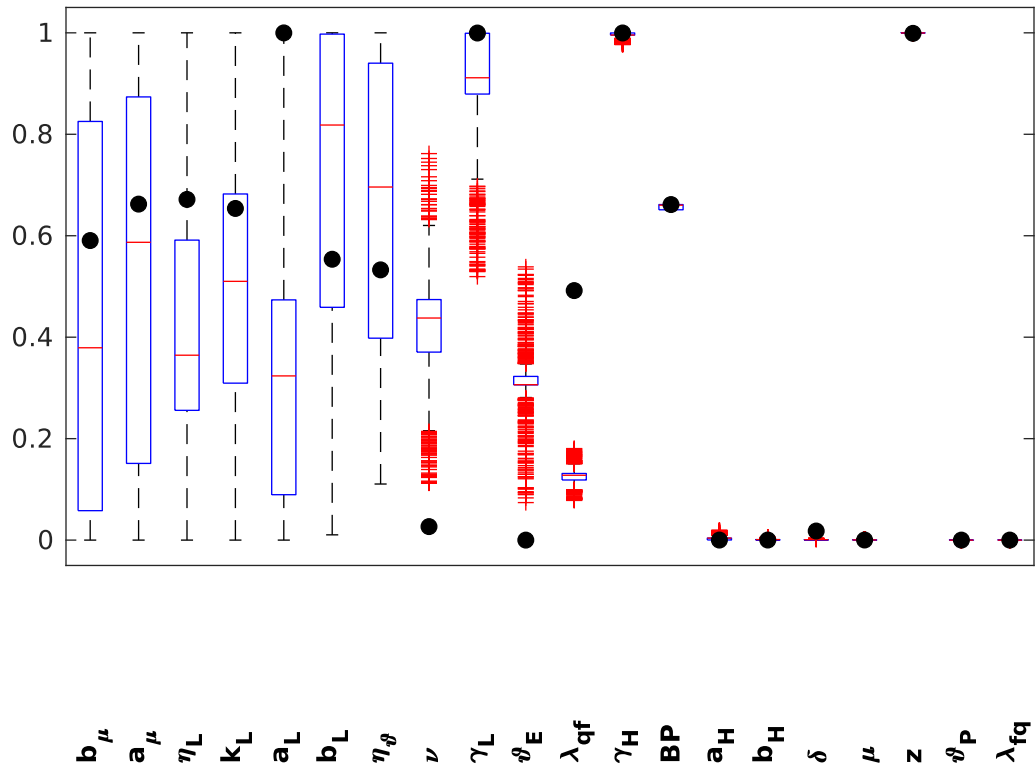
The number of estimations needed to perform the validation was1000.

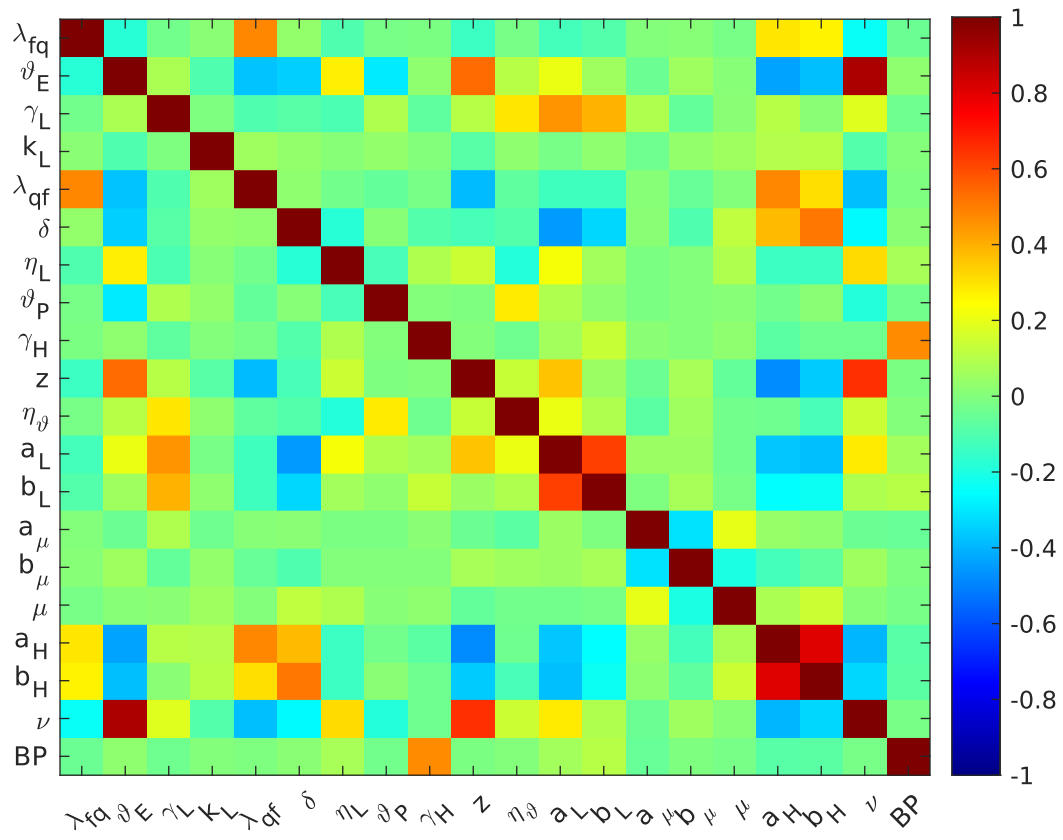
### 7.2. Estimated parameters with their intervals

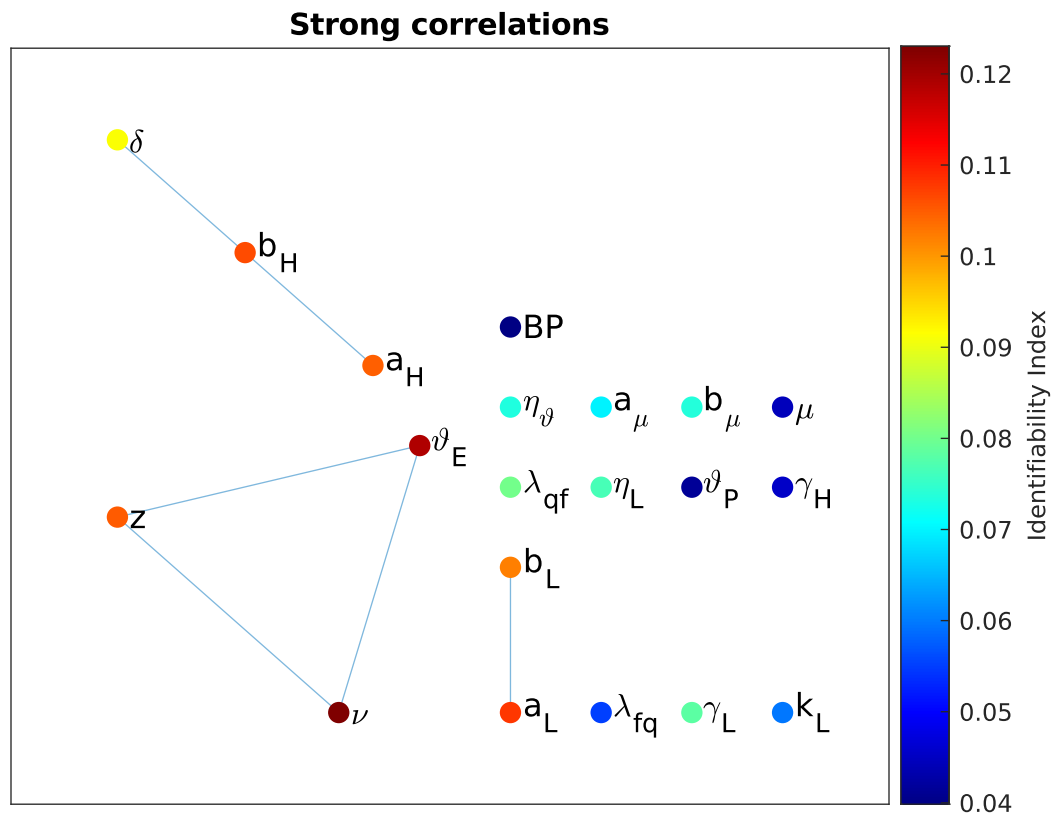
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.008'	'0'	'0'	'0.0553'
$\vartheta_E$	'0.2927'	'0.3192'	'0.306'	'0'	'0.1189'
$\gamma_L$	'0.8868'	'0.9358'	'0.9113'	'0.9996'	'0.0783'
$k_L$	'5.3711'	'5.8105'	'5.5908'	'6.8841'	'0.0599'
$\lambda_{qf}$	'0.1113'	'0.1443'	'0.1278'	'0.4919'	'0.0802'
$\delta$	'0'	'0.0042'	'0.0001'	'0.0027'	'0.0913'
$\eta_L$	'0.3416'	'0.3873'	'0.3645'	'0.6716'	'0.0766'
$\vartheta_P$	'0'	'0.0005'	'0'	'0'	'0.0417'
$\gamma_H$	'0.9888'	'1'	'0.9956'	'0.9997'	'0.0457'
$z$	'29.5019'	'30'	'29.9922'	'29.9691'	'0.105'
$\eta_{\vartheta}$	'0.6727'	'0.7193'	'0.696'	'0.5327'	'0.0733'
$a_L$	'5.2738'	'5.7892'	'5.5315'	'14.9978'	'0.1081'
$b_L$	'12.0419'	'12.8677'	'12.4548'	'8.7512'	'0.102'
$a_{\mu}$	'8.7788'	'9.6587'	'9.2187'	'10.2727'	'0.0699'
$b_{\mu}$	'5.8609'	'6.7554'	'6.3082'	'9.2672'	'0.0738'
$\mu$	'0'	'0.0106'	'0.0003'	'0.0002'	'0.0447'
$a_H$	'1'	'1.2377'	'1.0556'	'1.001'	'0.1046'
$b_H$	'1'	'1.0685'	'1.0136'	'1.002'	'0.1064'
$\nu$	'211.2505'	'226.5325'	'218.8915'	'13.3078'	'0.123'
BP	'190.3308'	'190.4363'	'190.3835'	'190.5'	'0.0399'

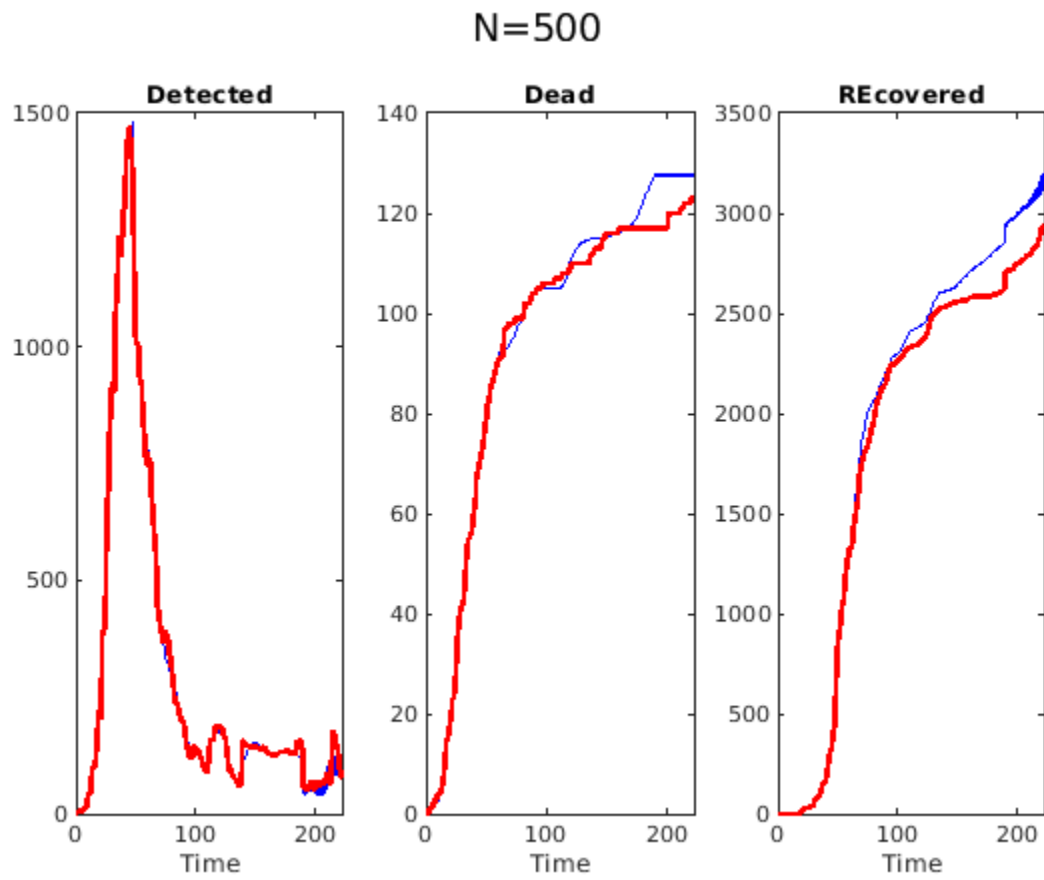
### 7.3. Identifiability analysis







## 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 data223 to the 269. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

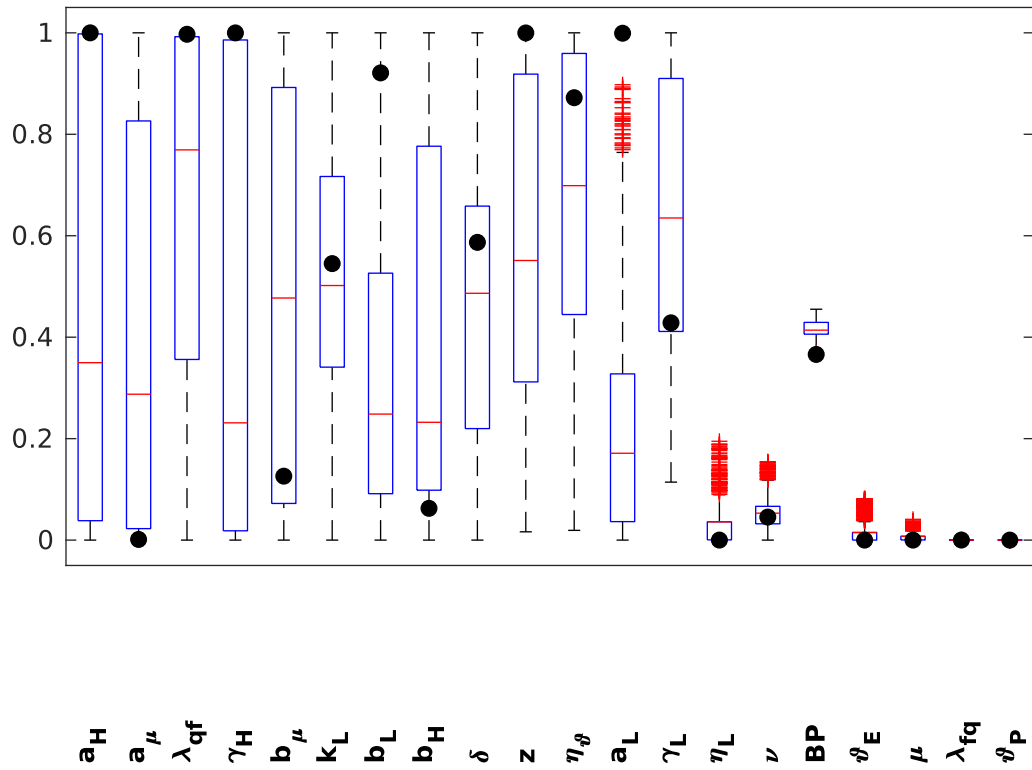
### 8.2. Estimated parameters with their intervals

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

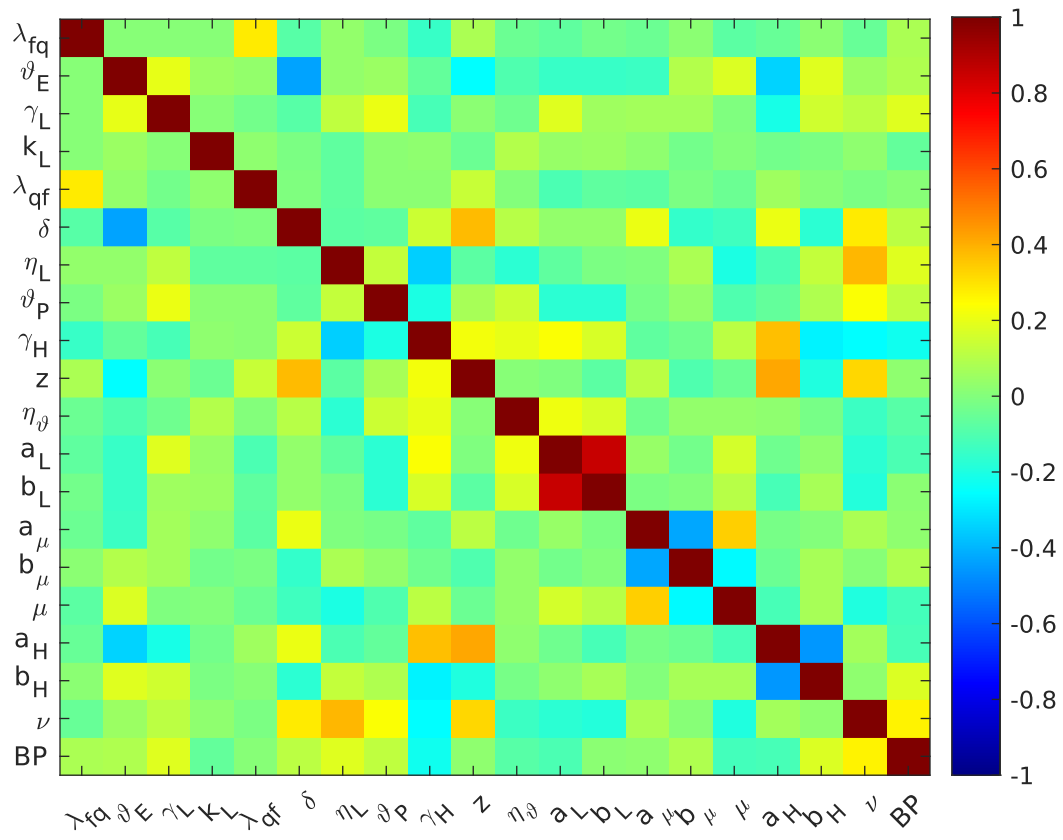
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

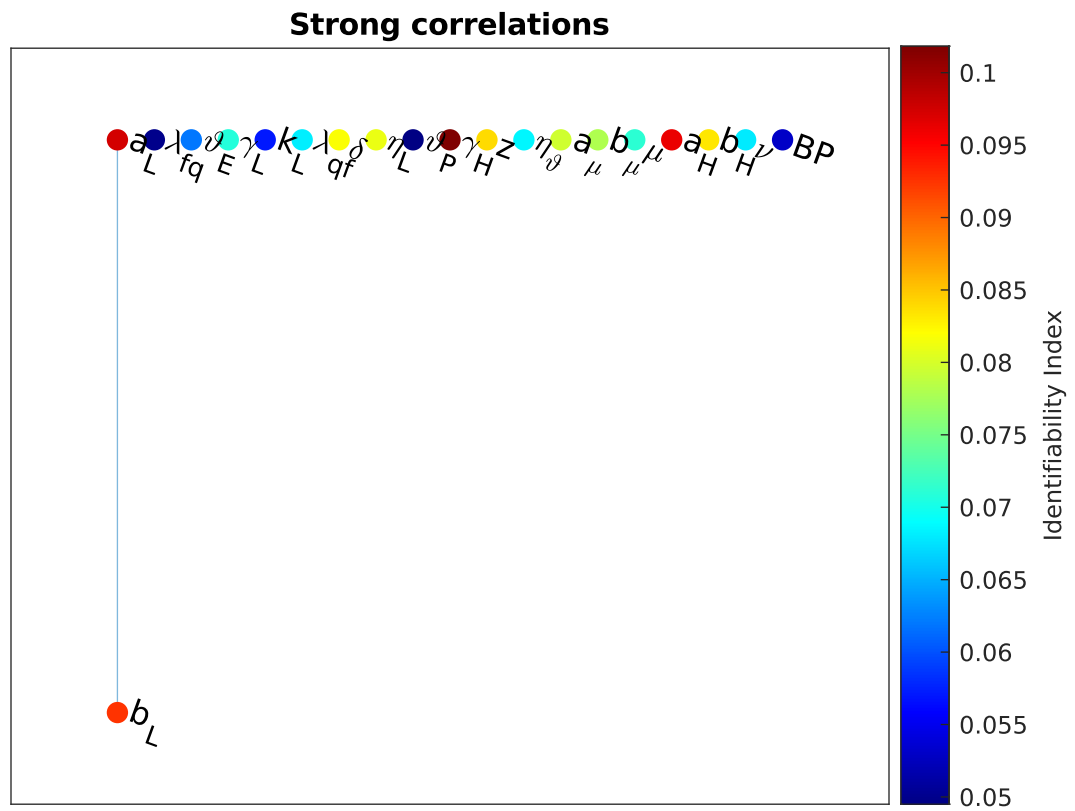
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0002'	'0.0001'	'0.0001'	'0.0501'
$\vartheta_E$	'0'	'0'	'0.015'	'0'	'0.0621'
$\gamma_L$	'0.4089'	'0.646'	'0.635'	'0.4283'	'0.0709'
$k_L$	'2.6231'	'6.6519'	'5.5166'	'5.9055'	'0.0571'
$\lambda_{qf}$	'0.7137'	'1'	'0.7693'	'0.9972'	'0.0682'
$\delta$	'0.0807'	'0.0889'	'0.073'	'0.088'	'0.0819'
$\eta_L$	'0'	'0'	'0.0361'	'0'	'0.0811'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0495'
$\gamma_H$	'0.6685'	'1'	'0.2312'	'0.9999'	'0.1018'
$z$	'28.4105'	'30'	'16.5361'	'29.9926'	'0.084'
$\eta_{\vartheta}$	'0.5786'	'0.8796'	'0.6987'	'0.8721'	'0.0686'
$a_L$	'13.0586'	'15'	'3.3972'	'14.9889'	'0.0974'
$b_L$	'11.3788'	'13.9713'	'4.478'	'13.895'	'0.0925'
$a_{\mu}$	'1'	'2.6631'	'5.0262'	'1.0184'	'0.0796'
$b_{\mu}$	'2.7455'	'8.0502'	'7.6812'	'2.7648'	'0.0781'
$\mu$	'0'	'0'	'0.0075'	'0'	'0.0713'
$a_H$	'12.0882'	'15'	'5.8964'	'14.9993'	'0.0963'
$b_H$	'1.5135'	'2.1001'	'4.2515'	'1.8768'	'0.0833'
$\nu$	'21.4089'	'25.8452'	'26.5491'	'22.6906'	'0.068'
BP	'217.3725'	'247.7913'	'223.2825'	'219.5477'	'0.053'

## 8.3. Identifiability analysis

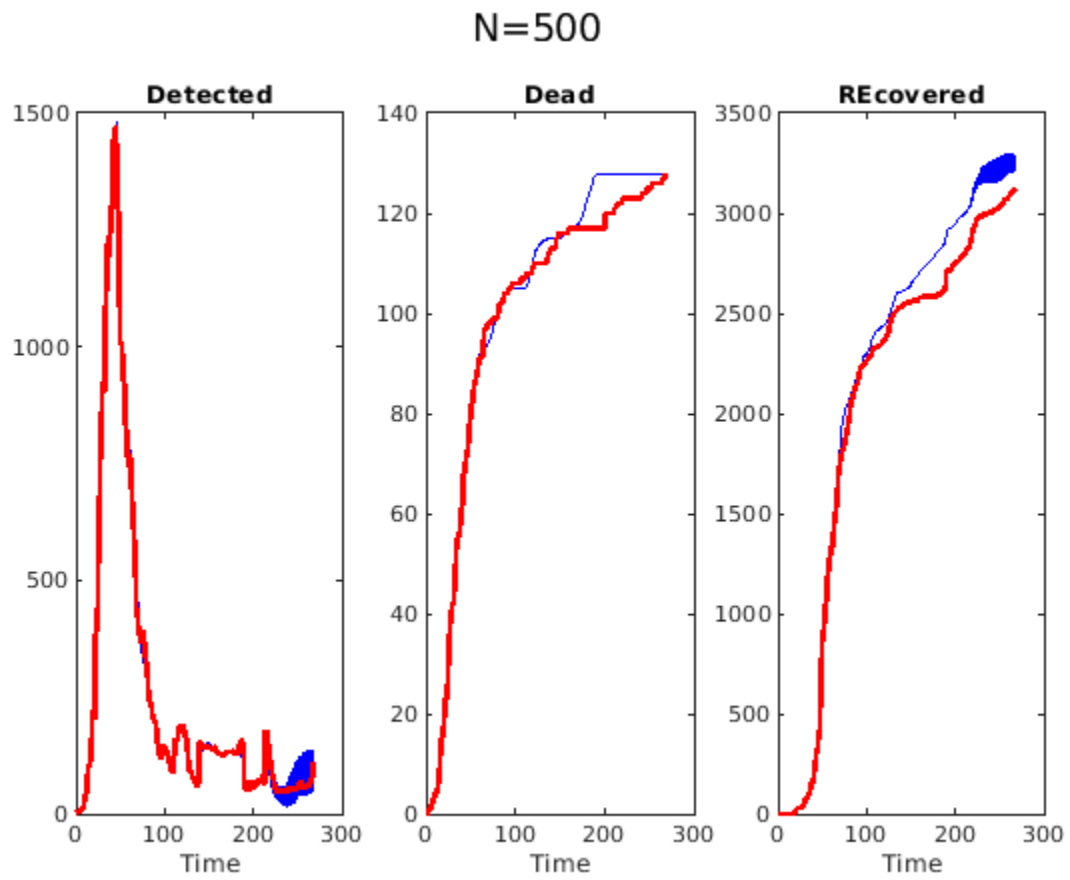








## 8.4. Uncertainty analysis



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## Chapter 9. Extension number9

### 9.1. Basic information

The extension to be validated consists of the time series from the data269 to the 304. The status of the validation is: COMPLETED.

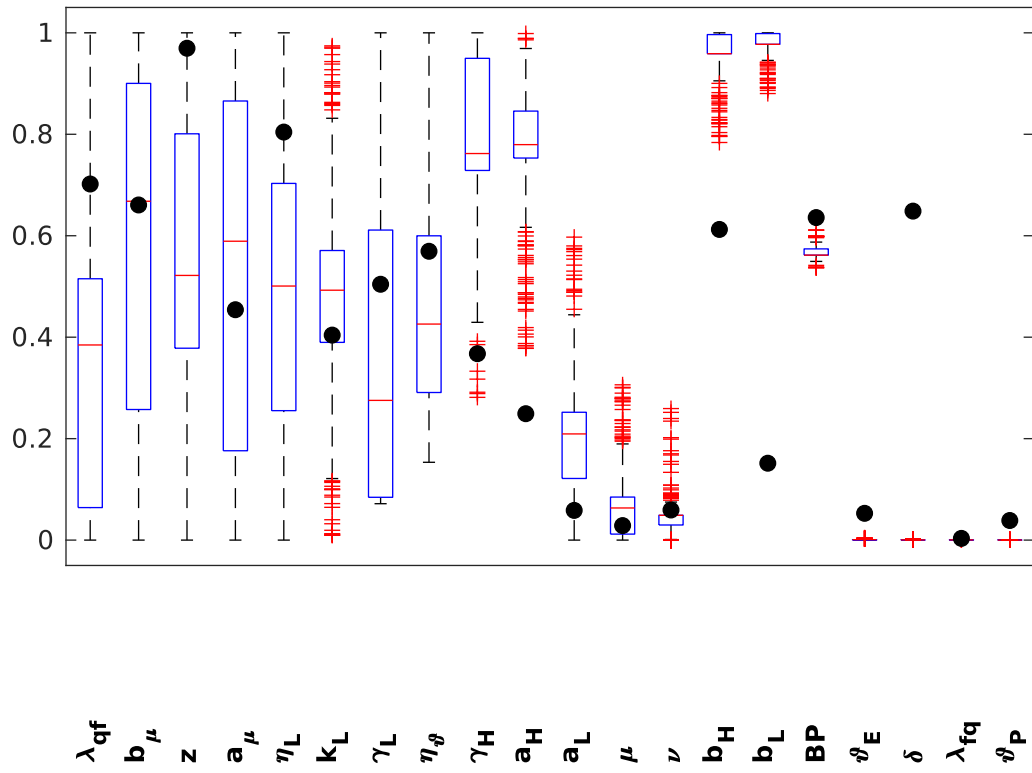
The number of estimations needed to perform the validation was1000.

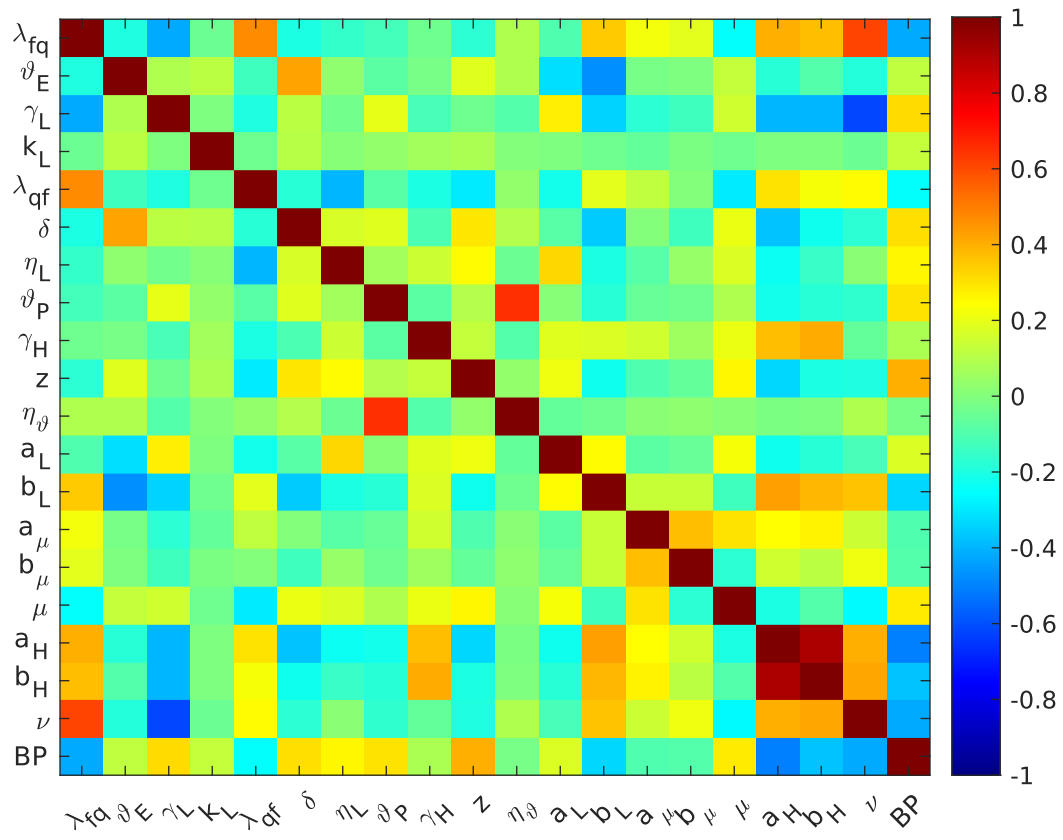
### 9.2. Estimated parameters with their intervals

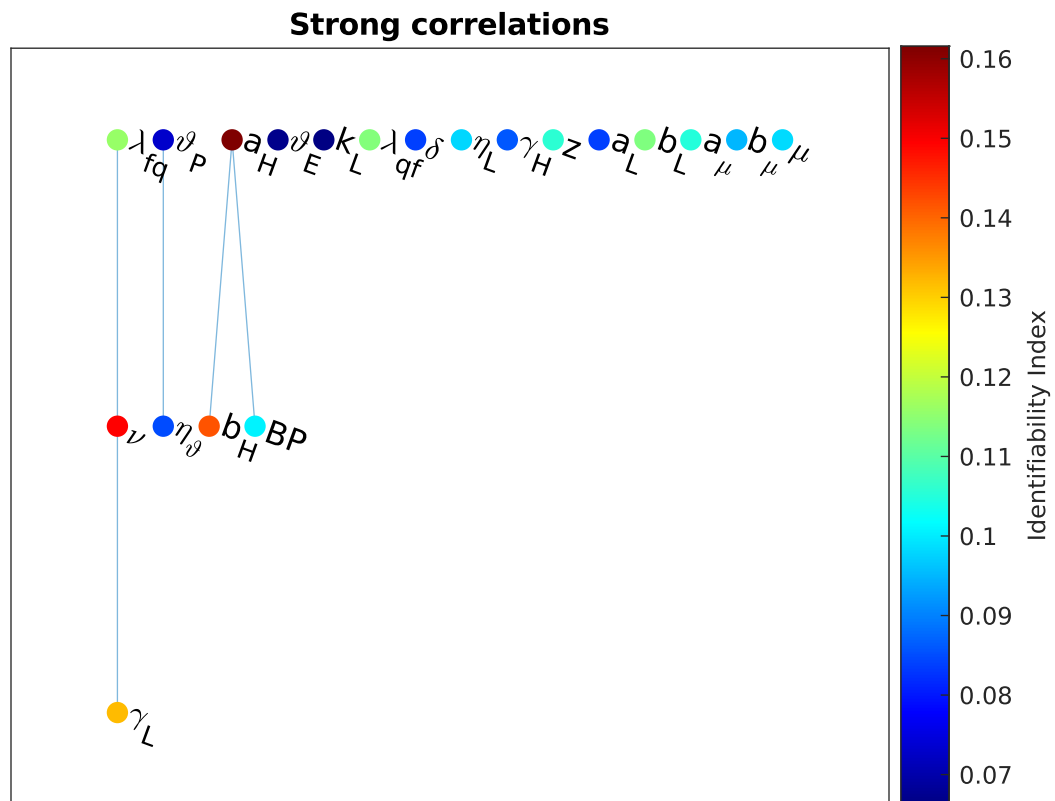
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0368'	'0.0004'	'0.0034'	'0.1159'
$\vartheta_E$	'0'	'0.013'	'0.0008'	'0.0528'	'0.0671'
$\gamma_L$	'0.2316'	'0.3192'	'0.2754'	'0.5043'	'0.132'
$k_L$	'5.1544'	'5.7129'	'5.4337'	'4.6372'	'0.0663'
$\lambda_{qf}$	'0.3439'	'0.4254'	'0.3847'	'0.702'	'0.1142'
$\delta$	'0'	'0.0039'	'0.0001'	'0.0973'	'0.0841'
$\eta_L$	'0.4625'	'0.5392'	'0.5008'	'0.8043'	'0.098'
$\vartheta_P$	'0'	'0.0013'	'0.0001'	'0.0386'	'0.0731'
$\gamma_H$	'0.7343'	'0.7898'	'0.762'	'0.3675'	'0.0862'
$z$	'14.5615'	'16.7437'	'15.6526'	'29.0884'	'0.1058'
$\eta_{\vartheta}$	'0.3974'	'0.4543'	'0.4259'	'0.5694'	'0.085'
$a_L$	'3.6457'	'4.2151'	'3.9304'	'1.8198'	'0.0839'
$b_L$	'14.1674'	'15'	'14.6831'	'3.1217'	'0.1137'
$a_{\mu}$	'8.5885'	'9.9088'	'9.2486'	'7.3581'	'0.105'
$b_{\mu}$	'9.7155'	'10.9878'	'10.3517'	'10.249'	'0.0953'
$\mu$	'0.0329'	'0.0938'	'0.0633'	'0.0286'	'0.0986'
$a_H$	'11.38'	'12.449'	'11.9145'	'4.4884'	'0.1616'
$b_H$	'13.8219'	'15'	'14.4241'	'9.5739'	'0.1418'
$\nu$	'4.1813'	'44.7231'	'24.4522'	'29.6709'	'0.1496'
BP	'268.3392'	'268.6608'	'268.5'	'274.5'	'0.1006'

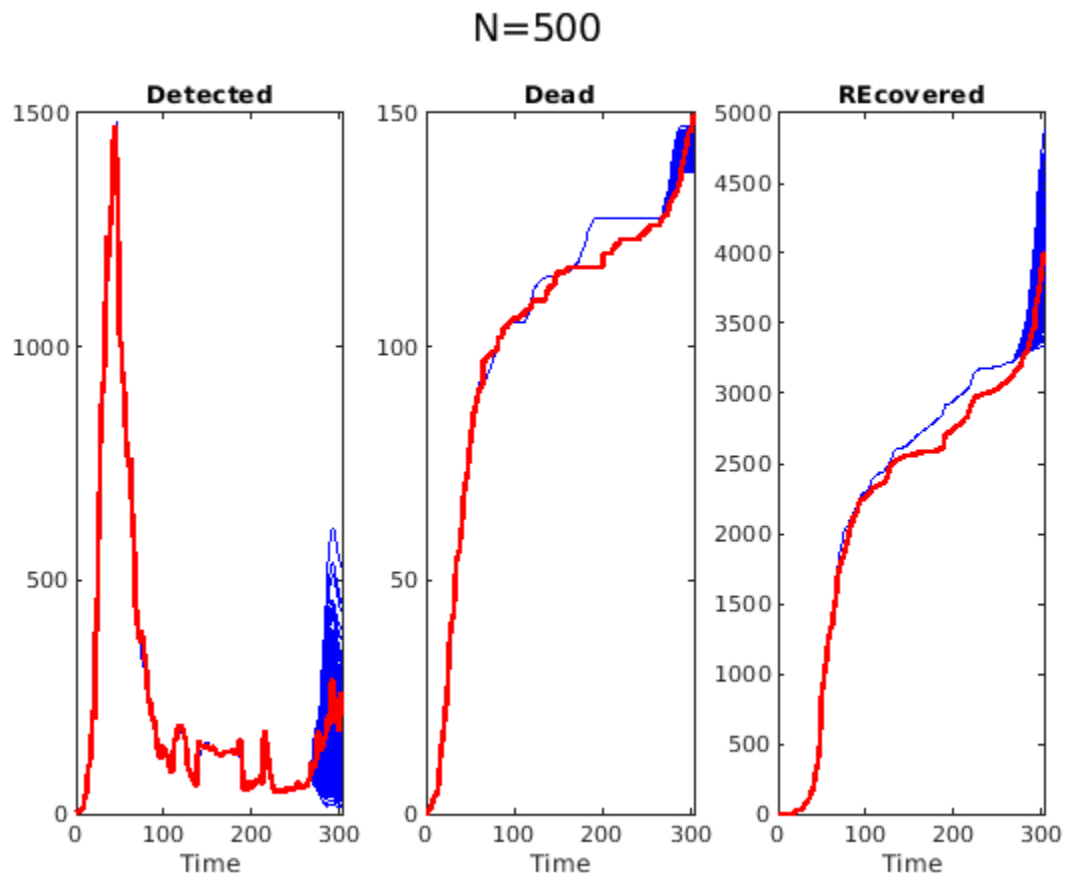
### 9.3. Identifiability analysis







## 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 data304 to the 321. The status of the validation is: COMPLETED.

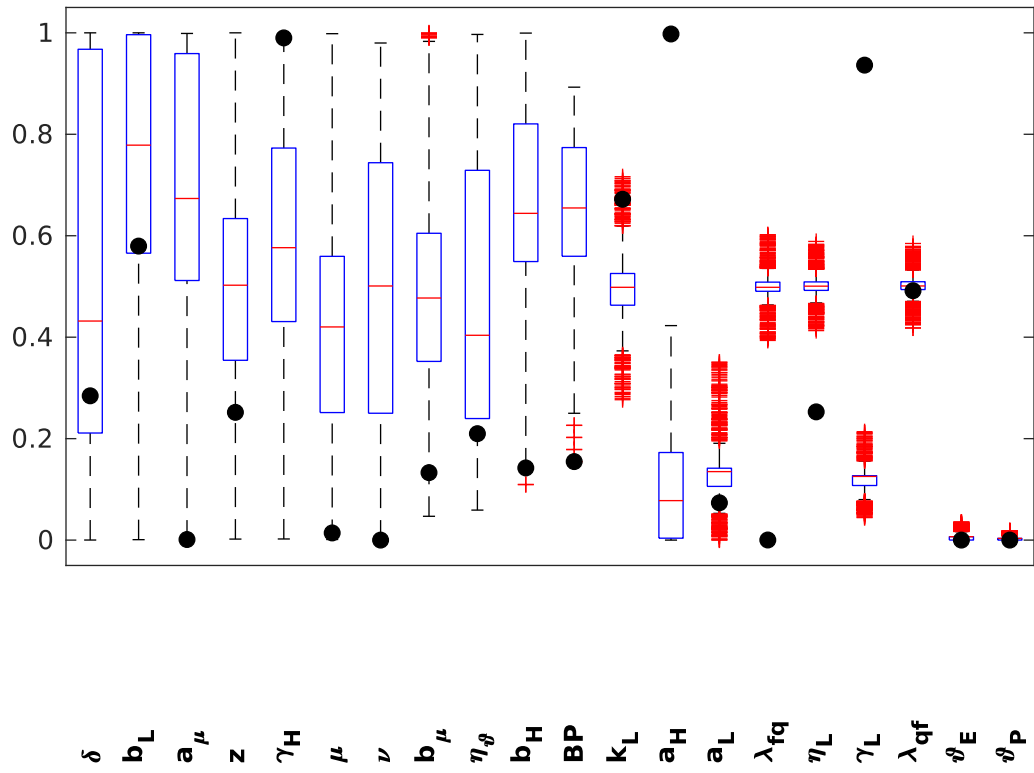
The number of estimations needed to perform the validation was1000.

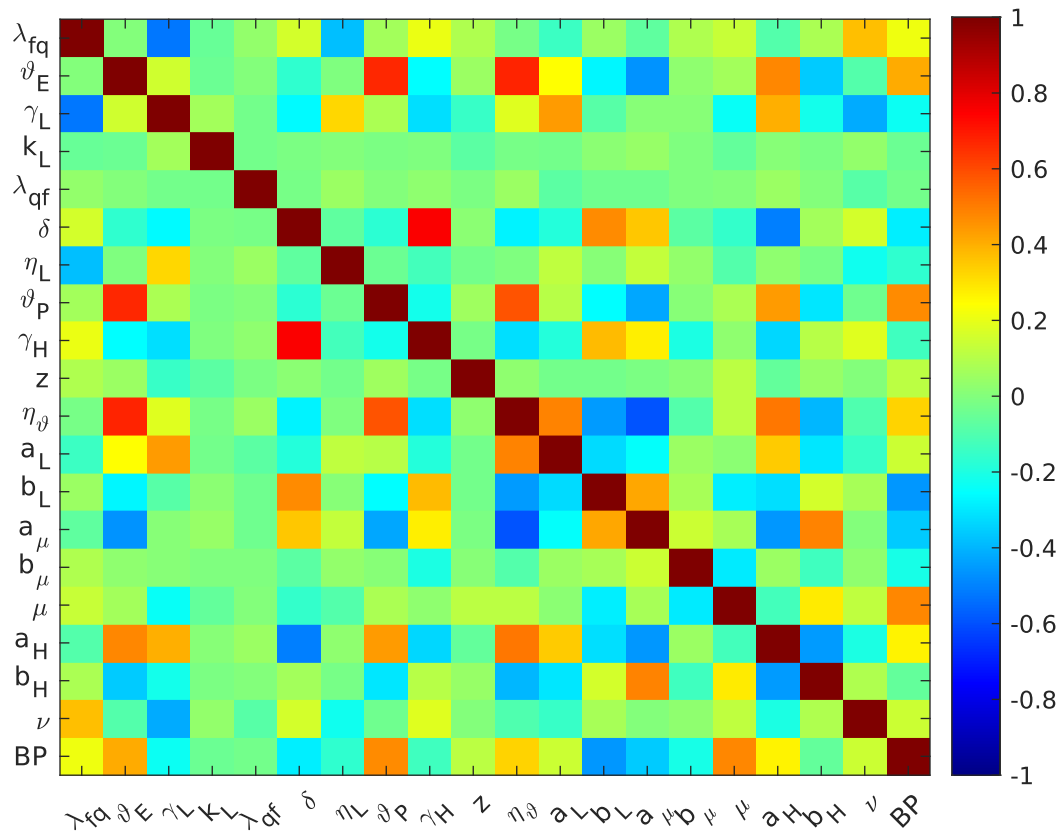
### 10.2. Estimated parameters with their intervals

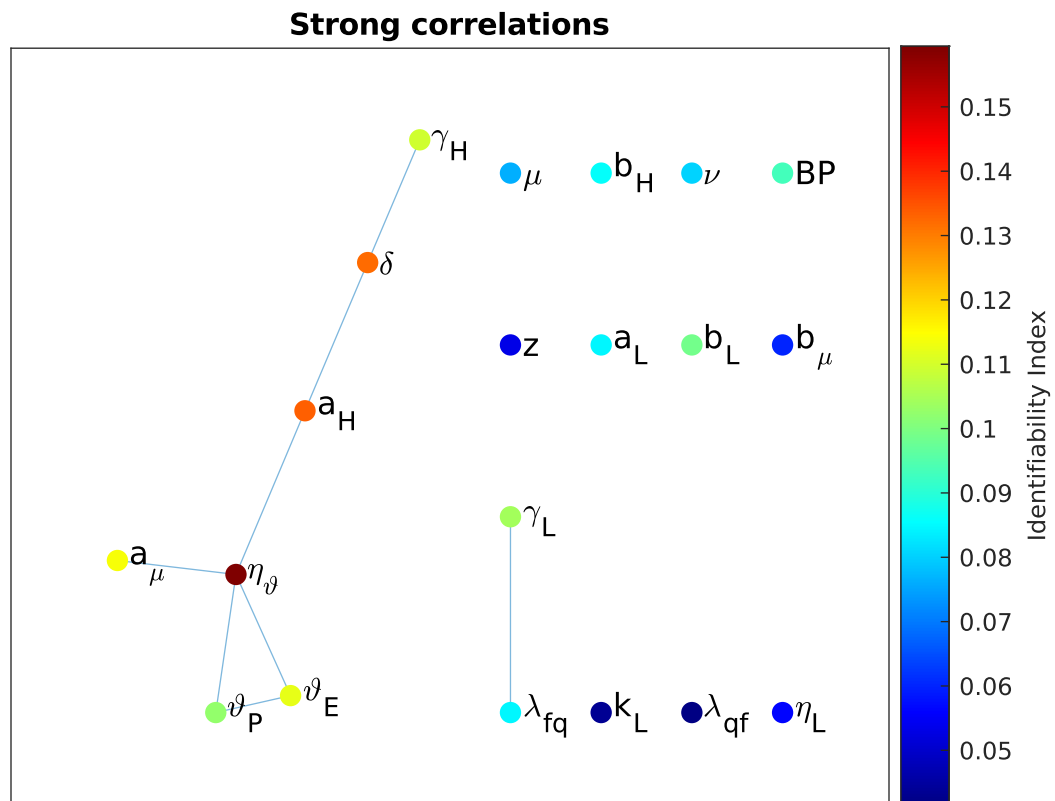
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.4859'	'0.5108'	'0.4983'	'0.0002'	'0.0845'
\vartheta_E	'0'	'0.0136'	'0.0067'	'0'	'0.1123'
\gamma_L	'0.1103'	'0.1408'	'0.1255'	'0.9363'	'0.1046'
k_L	'5.3831'	'5.5872'	'5.4852'	'7.0471'	'0.0435'
\lambda_{qf}	'0.4914'	'0.5105'	'0.501'	'0.4916'	'0.0416'
\delta	'0.0602'	'0.0693'	'0.0648'	'0.0427'	'0.1322'
\eta_L	'0.4916'	'0.5095'	'0.5006'	'0.2528'	'0.0568'
\vartheta_P	'0.0015'	'0.0054'	'0.0034'	'0'	'0.1025'
\gamma_H	'0.5552'	'0.5977'	'0.5765'	'0.99'	'0.1093'
z	'14.5795'	'15.5683'	'15.0739'	'7.5554'	'0.0533'
\eta_{\vartheta}	'0.3847'	'0.4228'	'0.4038'	'0.2098'	'0.1594'
a_L	'2.6899'	'3.0905'	'2.8902'	'2.0289'	'0.0847'
b_L	'11.5973'	'12.2025'	'11.8999'	'9.1142'	'0.0988'
a_{\mu}	'10.16'	'10.6958'	'10.4279'	'1.0162'	'0.1142'
b_{\mu}	'7.4577'	'7.9049'	'7.6813'	'2.8619'	'0.0602'
\mu	'0.4034'	'0.437'	'0.4202'	'0.0141'	'0.0764'
a_H	'1.8185'	'2.3608'	'2.0896'	'14.9678'	'0.1333'
b_H	'9.7843'	'10.2476'	'10.016'	'2.9918'	'0.0862'
\nu	'238.4282'	'262.5151'	'250.4717'	'0.0029'	'0.0803'
BP	'296.0082'	'296.9918'	'296.5'	'275.5'	'0.0933'

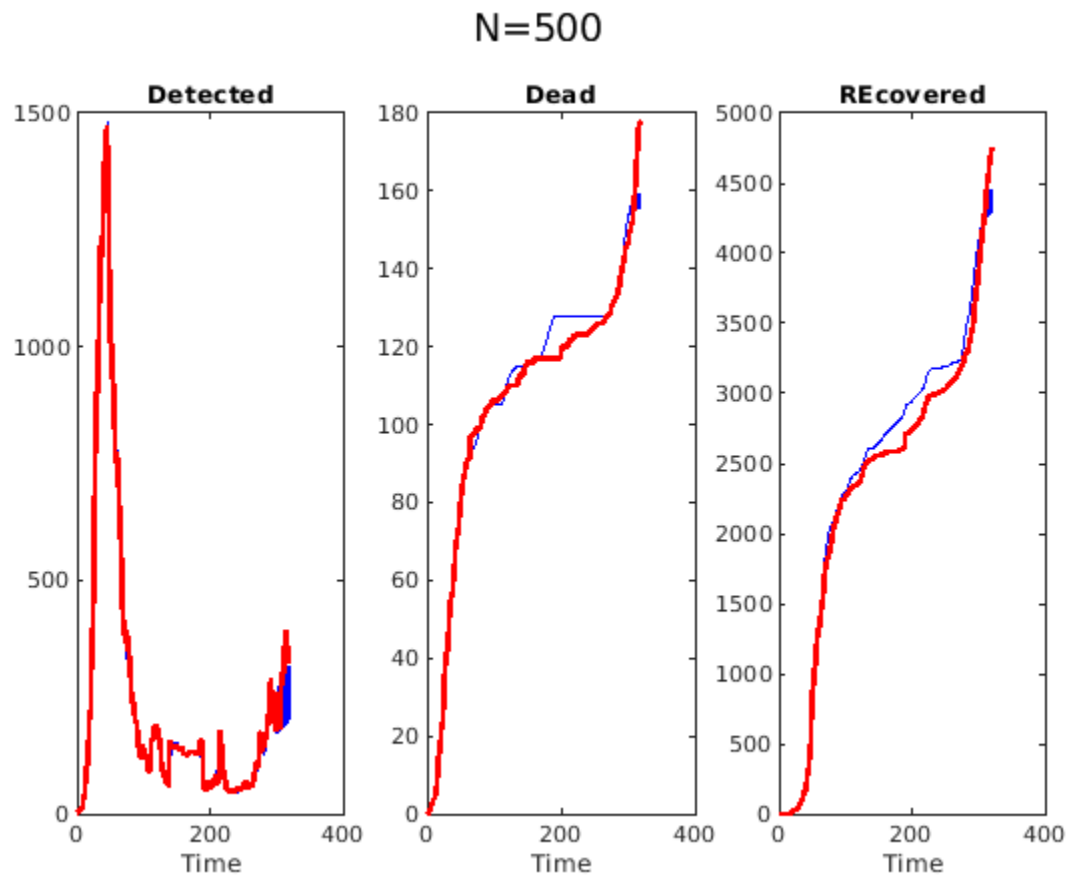
### 10.3. Identifiability analysis







## 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 data321 to the 374. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

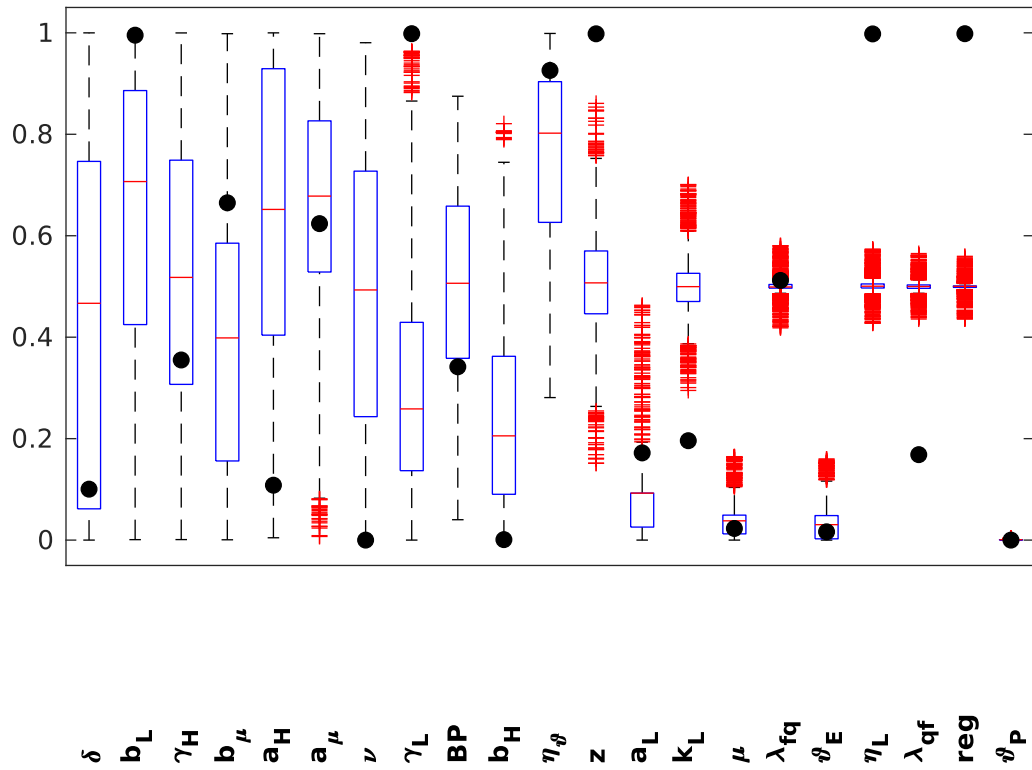
### 11.2. Estimated parameters with their intervals

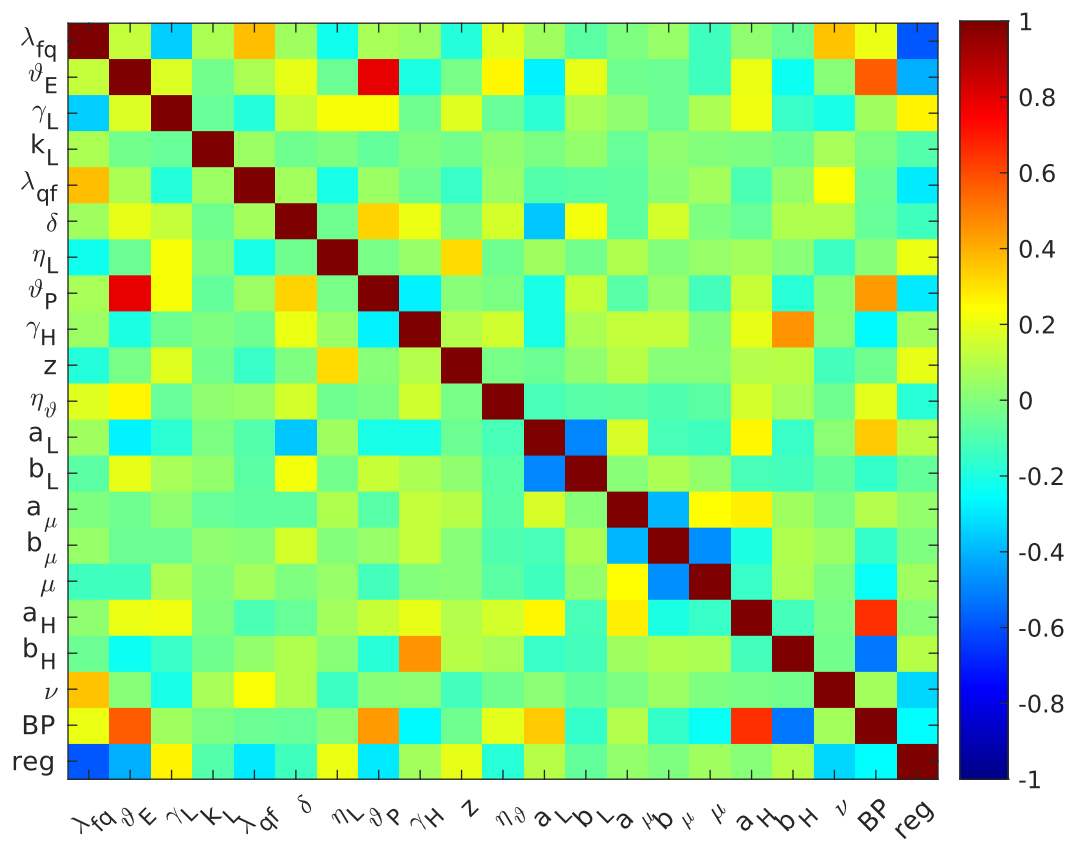
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

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

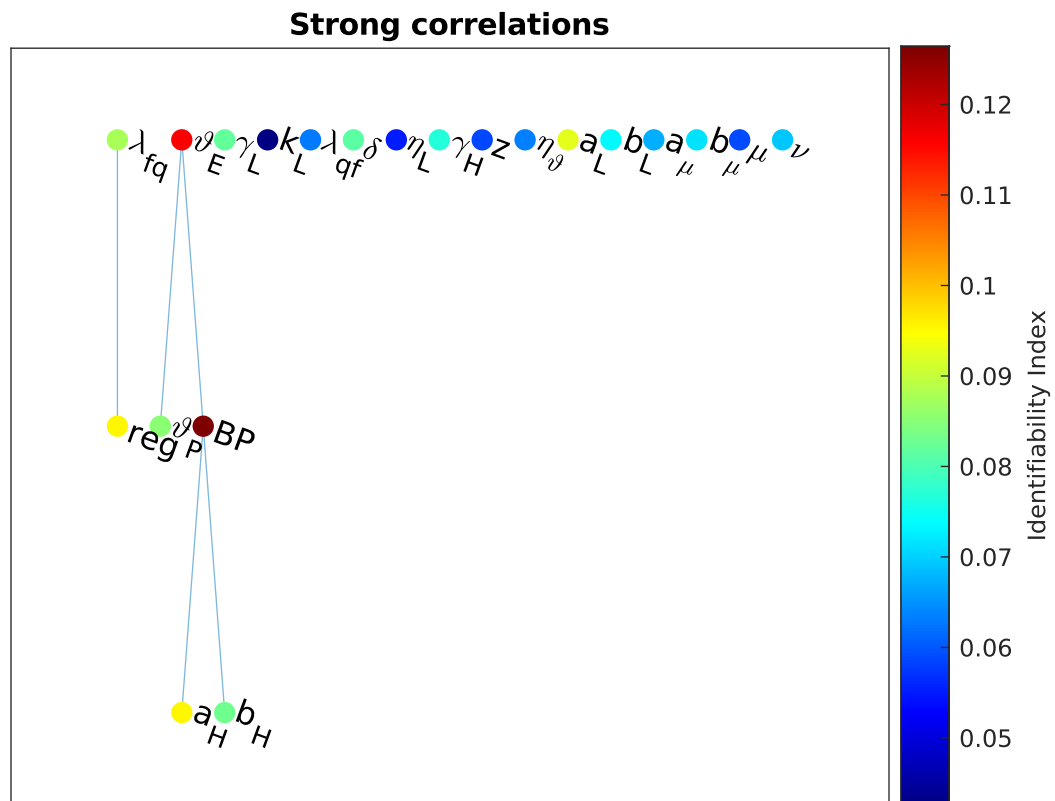
	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.2497'	'0.5311'	'0.499'	'0.5118'	'0.0877'
\vartheta_E	'0.0119'	'0.0295'	'0.0304'	'0.0163'	'0.1161'
\gamma_L	'0.5272'	'1'	'0.2593'	'0.9983'	'0.082'
k_L	'1.4963'	'5.9699'	'5.4968'	'2.7635'	'0.0427'
\lambda_{qf}	'0.1634'	'0.3443'	'0.5'	'0.1684'	'0.063'
\delta	'0.0085'	'0.0152'	'0.07'	'0.0151'	'0.0813'
\eta_L	'0.3701'	'1'	'0.5005'	'0.9979'	'0.0553'
\vartheta_P	'0'	'0'	'0.0007'	'0'	'0.0852'
\gamma_H	'0.178'	'0.4058'	'0.5179'	'0.3551'	'0.0768'
z	'19.9626'	'30'	'15.2124'	'29.9421'	'0.0589'
\eta_{\vartheta}	'0.418'	'0.9391'	'0.8022'	'0.9259'	'0.0634'
a_L	'1.6145'	'3.4609'	'2.2974'	'3.4071'	'0.0926'
b_L	'7.091'	'15'	'10.8952'	'14.9349'	'0.0735'
a_{\mu}	'3.882'	'15'	'10.4922'	'9.7342'	'0.0675'
b_{\mu}	'2.5924'	'11.2557'	'6.5801'	'10.3086'	'0.0718'
\mu	'0.0012'	'0.0389'	'0.038'	'0.0229'	'0.0591'
a_H	'2.3551'	'4.153'	'10.1262'	'2.5153'	'0.0956'
b_H	'1'	'1.5133'	'3.877'	'1.013'	'0.0832'
\nu	'0.0001'	'0.0024'	'246.568'	'0.0012'	'0.0695'
BP	'323.7486'	'329.7767'	'334.3777'	'324.5'	'0.1264'
reg	'0.202'	'0.25'	'0.1251'	'0.2496'	'0.0954'

### 11.3. Identifiability analysis

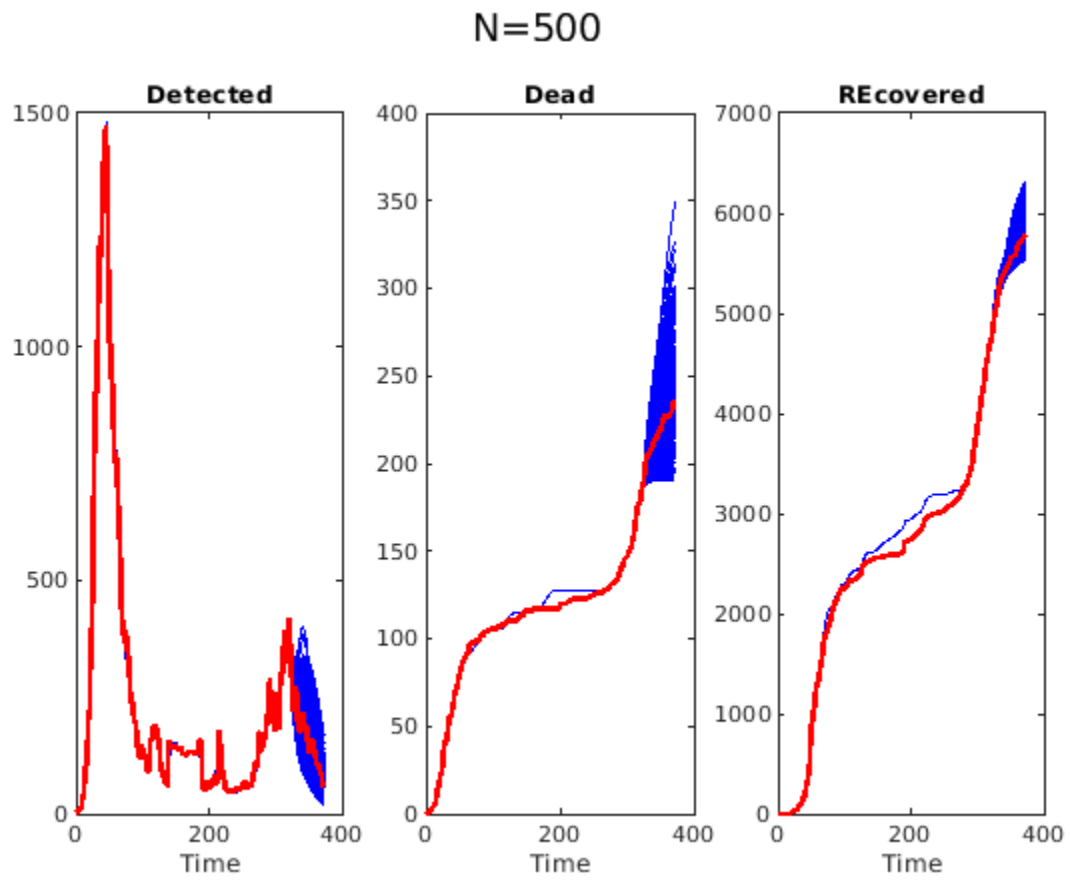








## 11.4. Uncertainty analysis



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## Chapter 12. Extension number12

### 12.1. Basic information

The extension to be validated consists of the time series from the data374 to the 468. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

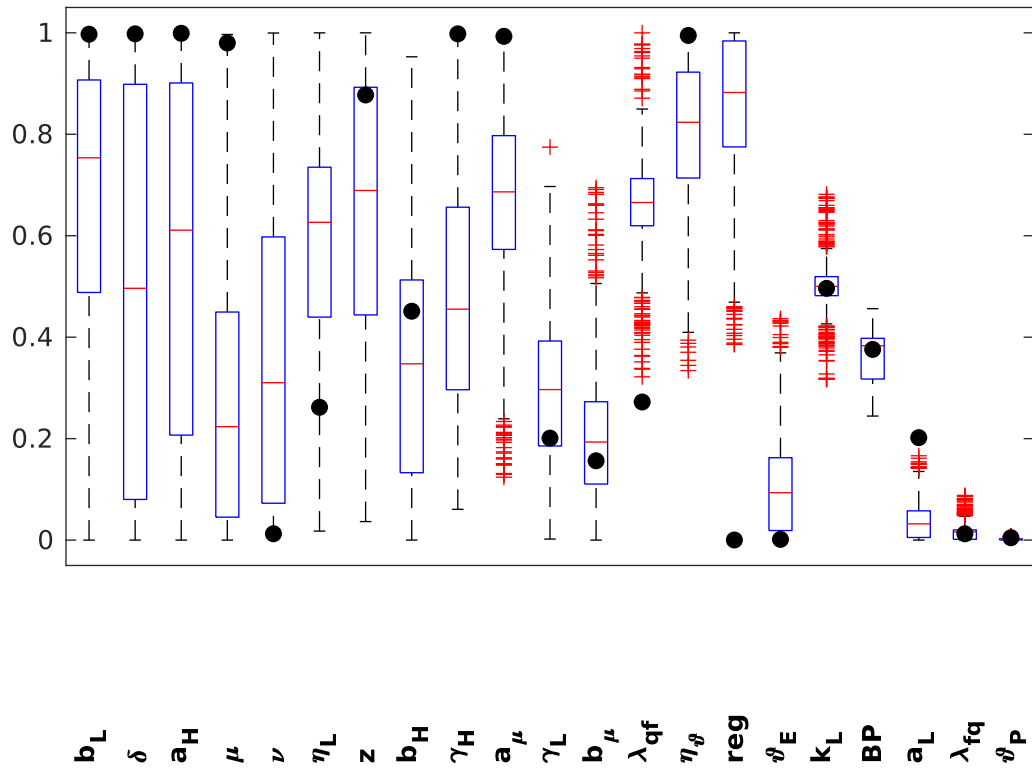
### 12.2. Estimated parameters with their intervals

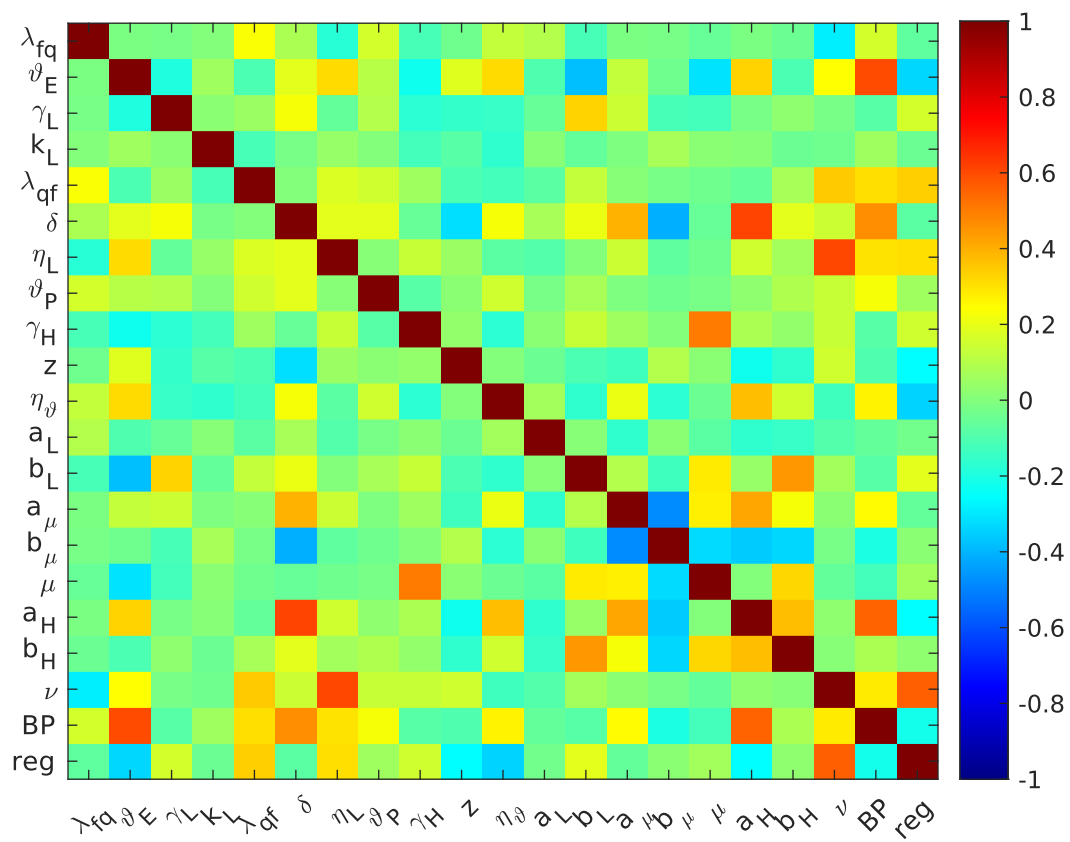
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

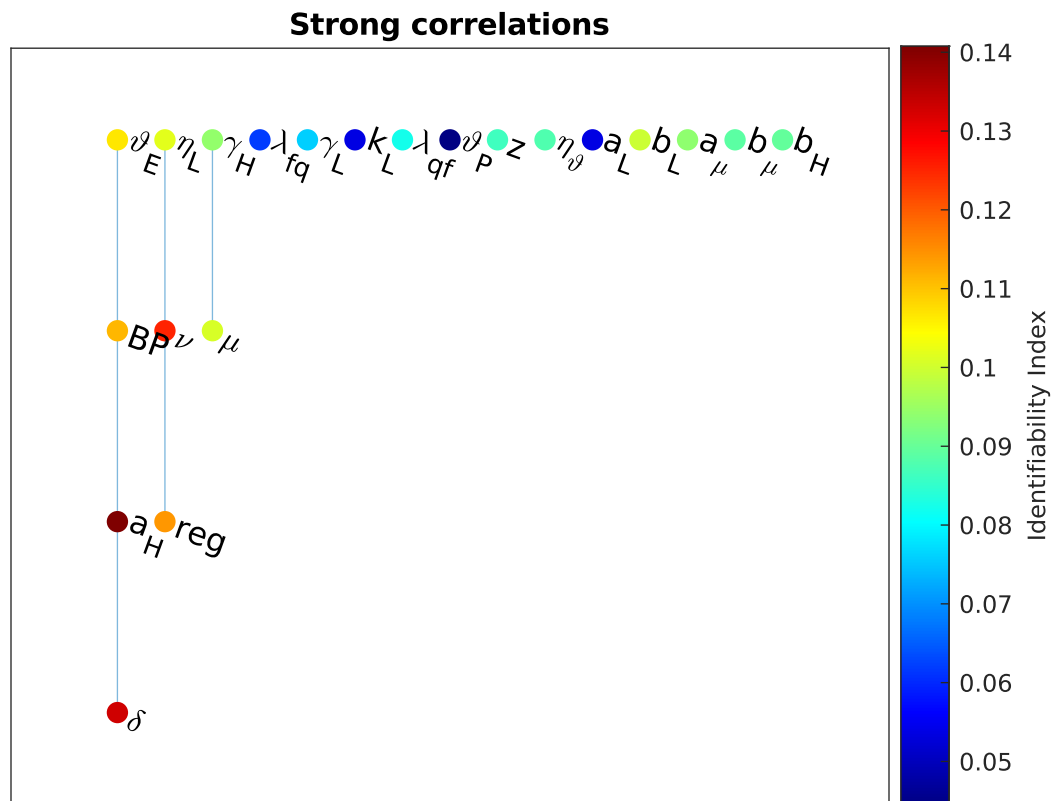
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0015'	'0.0586'	'0.0165'	'0.0125'	'0.0621'
$\vartheta_E$	'0.0001'	'0.0033'	'0.0934'	'0.0015'	'0.1069'
$\gamma_L$	'0.1829'	'0.8733'	'0.2968'	'0.201'	'0.0759'
$k_L$	'1'	'10'	'5.5004'	'5.467'	'0.0539'
$\lambda_{qf}$	'0.2705'	'0.6246'	'0.6652'	'0.2723'	'0.0823'
$\delta$	'0.101'	'0.15'	'0.0745'	'0.1497'	'0.1332'
$\eta_L$	'0.2396'	'0.5248'	'0.626'	'0.2619'	'0.1019'
$\vartheta_P$	'0.003'	'0.0097'	'0.0016'	'0.0047'	'0.0446'
$\gamma_H$	'0.2408'	'1'	'0.4552'	'0.998'	'0.0944'
$z$	'15.2784'	'30'	'20.6772'	'26.3251'	'0.0865'
$\eta_{\vartheta}$	'0.7896'	'1'	'0.8236'	'0.9949'	'0.0881'
$a_L$	'3.416'	'9.4888'	'1.4494'	'3.8275'	'0.0537'
$b_L$	'6.5418'	'15'	'11.5502'	'14.9618'	'0.0997'
$a_{\mu}$	'10.476'	'15'	'10.6101'	'14.9033'	'0.094'
$b_{\mu}$	'1'	'3.5937'	'3.7066'	'3.1886'	'0.0892'
$\mu$	'0.19'	'1'	'0.2237'	'0.98'	'0.1006'
$a_H$	'9.447'	'15'	'9.5537'	'14.9872'	'0.1408'
$b_H$	'3.4662'	'7.7642'	'5.8655'	'7.3165'	'0.0898'
$\nu$	'5.0303'	'10.8911'	'155.1239'	'6.2603'	'0.1251'
BP	'372.4397'	'375.5435'	'373.5'	'372.5'	'0.1114'
reg	'0'	'0.0001'	'0.2204'	'0.0001'	'0.1143'

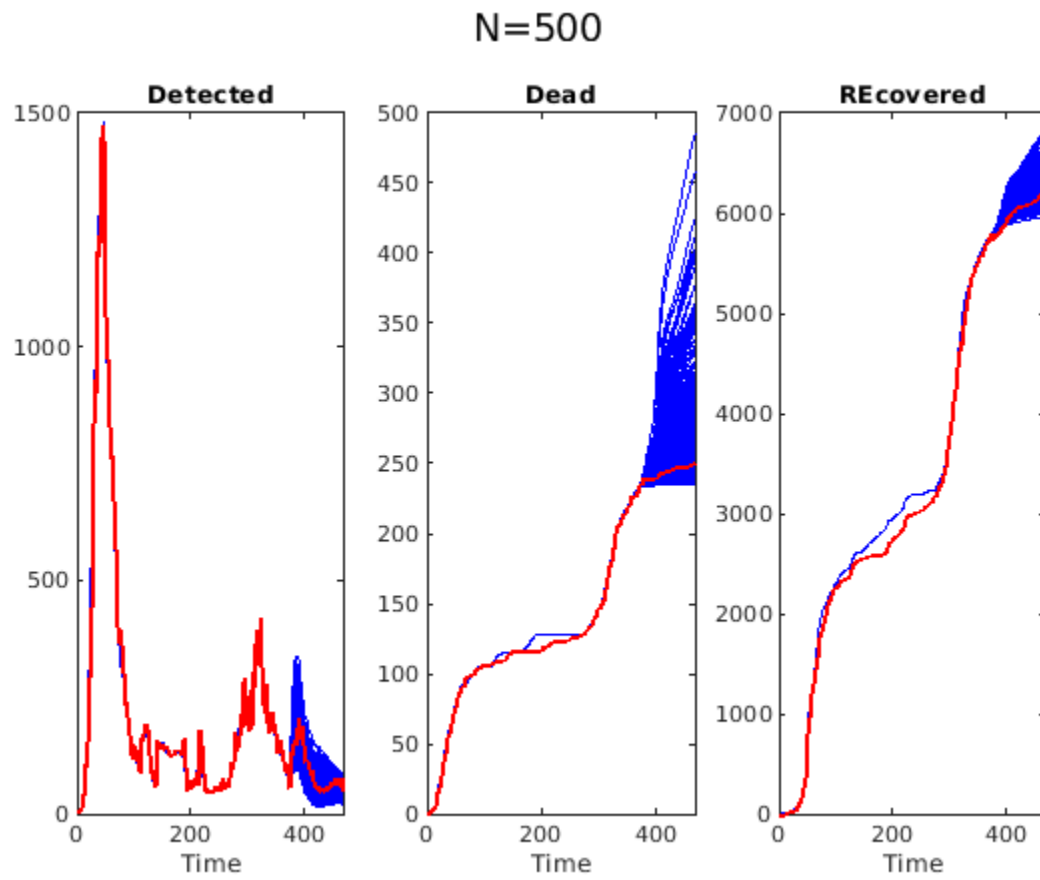
### 12.3. Identifiability analysis







## 12.4. Uncertainty analysys



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## Chapter 13. Extension number13

### 13.1. Basic information

The extension to be validated consists of the time series from the data468 to the 704. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

### 13.2. Estimated parameters with their intervals

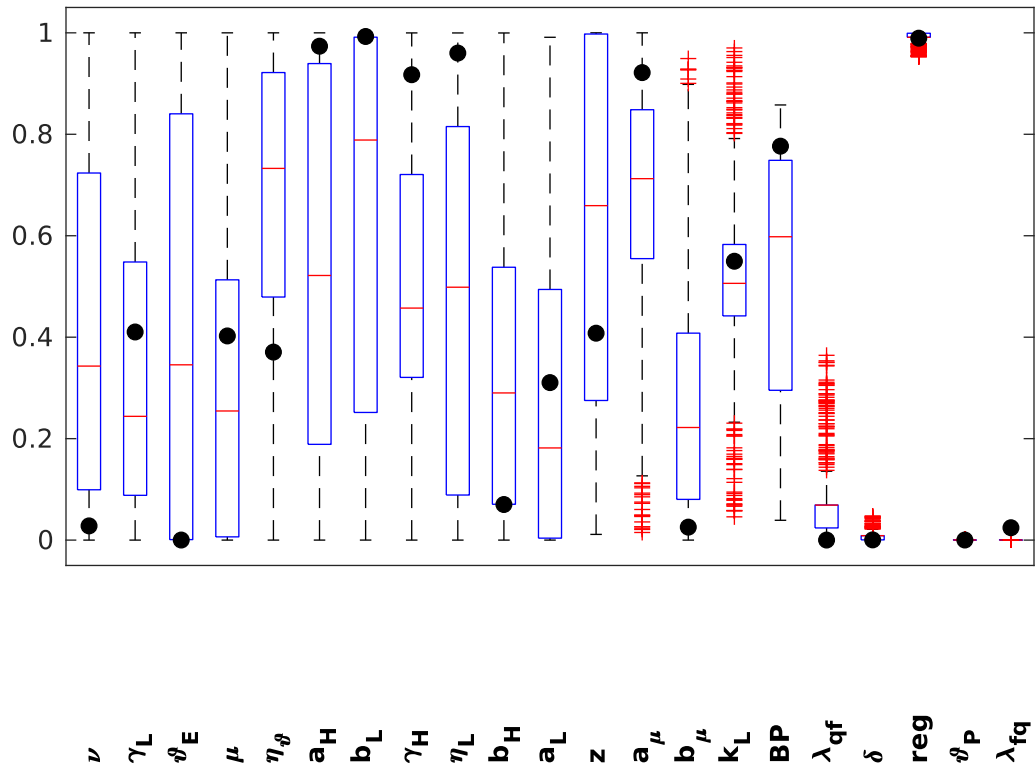
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

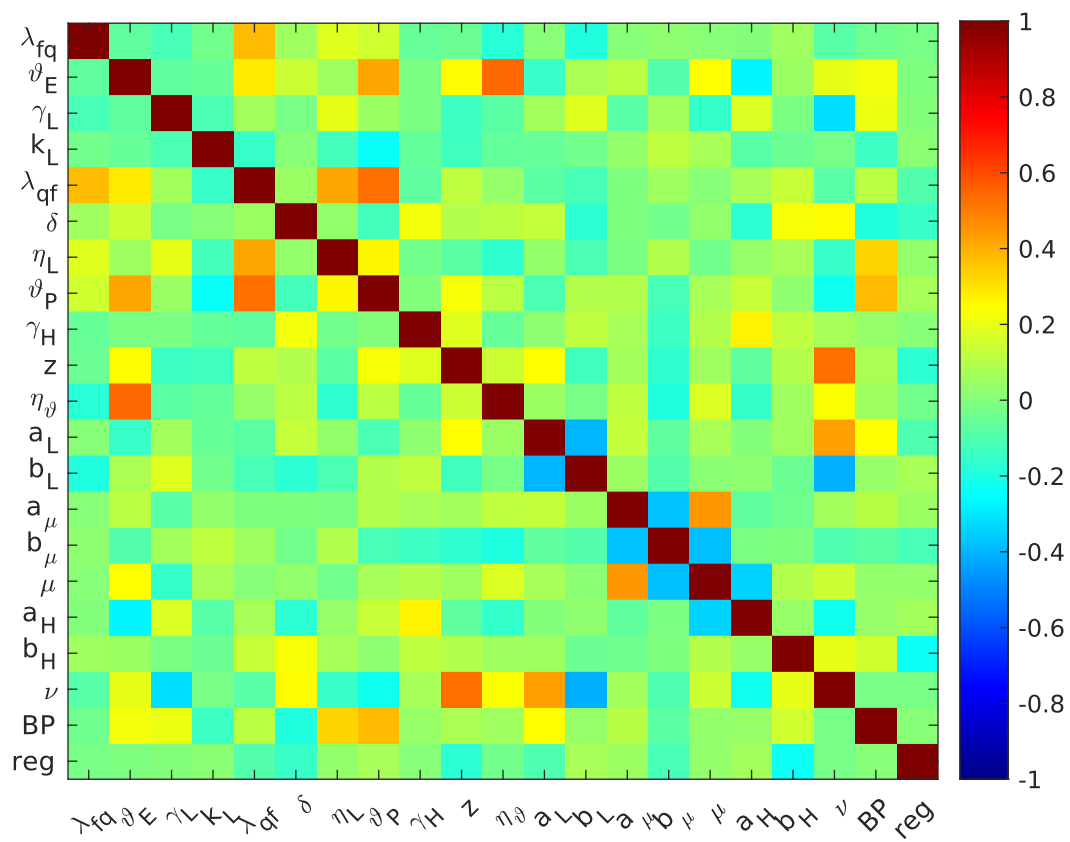
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

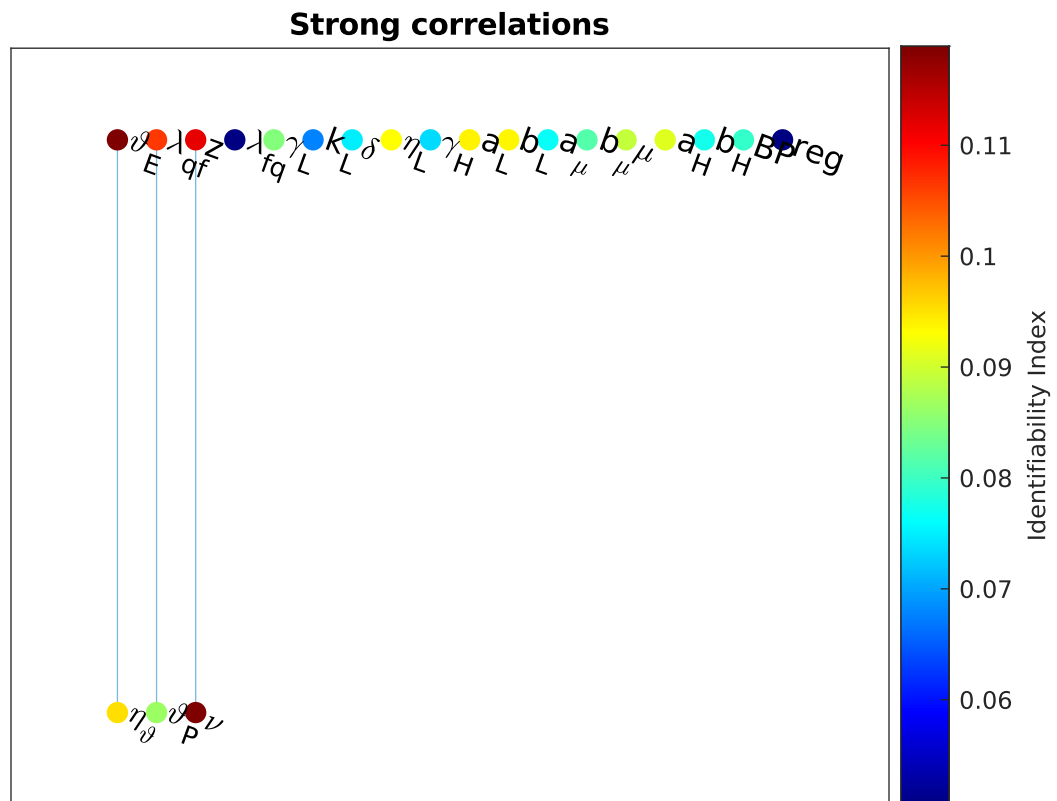
	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0202'	'0.0268'	'0.0002'	'0.0244'	'0.0508'
\vartheta_E	'0.0001'	'0.0003'	'0.3455'	'0.0001'	'0.1189'
\gamma_L	'0.3794'	'0.5143'	'0.244'	'0.4103'	'0.085'
k_L	'2.4087'	'6.5429'	'5.5552'	'5.9475'	'0.0679'
\lambda_{qf}	'0'	'0.0002'	'0.0691'	'0.0001'	'0.1065'
\delta	'0.0001'	'0.0001'	'0.0013'	'0.0001'	'0.0751'
\eta_L	'0.5493'	'1'	'0.4985'	'0.9601'	'0.0932'
\vartheta_P	'0.0001'	'0.0004'	'0.0003'	'0.0002'	'0.0866'
\gamma_H	'0.6162'	'0.9942'	'0.4574'	'0.9174'	'0.0736'
z	'11.2908'	'15.2187'	'19.7797'	'12.2363'	'0.1118'
\eta_{\vartheta}	'0.3382'	'0.3808'	'0.7328'	'0.3706'	'0.0953'
a_L	'4.5647'	'5.5742'	'3.55'	'5.3467'	'0.0939'
b_L	'11.8378'	'15'	'12.0412'	'14.8988'	'0.0937'
a_{\mu}	'12.2545'	'14.4165'	'10.9717'	'13.902'	'0.0765'
b_{\mu}	'1.322'	'7.6995'	'4.1131'	'1.3578'	'0.0816'
\mu	'0.3314'	'0.7221'	'0.2545'	'0.4025'	'0.0892'
a_H	'14.0872'	'15'	'8.3031'	'14.6308'	'0.091'
b_H	'1.4579'	'8.051'	'5.0616'	'1.9822'	'0.0774'
\nu	'13.2425'	'17.8682'	'171.5168'	'14.0058'	'0.1189'
BP	'622.45'	'626.45'	'565.3612'	'622.5'	'0.0795'
reg	'0.2234'	'0.25'	'0.2478'	'0.2474'	'0.0506'



### 13.3. Identifiability analysis







### 13.4. Uncertainty analysys

