

# **Validation process forCORDOBA**

**The epidemiology research group, EAFIT**

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# Table of Contents

<a href="#">Chapter 1. Extension number1</a>	1
<a href="#">1.1. Basic information</a>	1
<a href="#">1.2. Estimated parameters with their intervals</a>	1
<a href="#">1.3. Identifiability analisys</a>	2
<a href="#">1.4. Uncertainty analisys</a>	5
<a href="#">Chapter 2. Extension number2</a>	6
<a href="#">2.1. Basic information</a>	6
<a href="#">2.2. Estimated parameters with their intervals</a>	6
<a href="#">2.3. Identifiability analisys</a>	7
<a href="#">2.4. Uncertainty analisys</a>	10
<a href="#">Chapter 3. Extension number3</a>	11
<a href="#">3.1. Basic information</a>	11
<a href="#">3.2. Estimated parameters with their intervals</a>	11
<a href="#">3.3. Identifiability analisys</a>	12
<a href="#">3.4. Uncertainty analisys</a>	15
<a href="#">Chapter 4. Extension number4</a>	16
<a href="#">4.1. Basic information</a>	16
<a href="#">4.2. Estimated parameters with their intervals</a>	16
<a href="#">4.3. Identifiability analisys</a>	17
<a href="#">4.4. Uncertainty analisys</a>	20
<a href="#">Chapter 5. Extension number5</a>	21
<a href="#">5.1. Basic information</a>	21
<a href="#">5.2. Estimated parameters with their intervals</a>	21
<a href="#">5.3. Identifiability analisys</a>	22
<a href="#">5.4. Uncertainty analisys</a>	25
<a href="#">Chapter 6. Extension number6</a>	26
<a href="#">6.1. Basic information</a>	26
<a href="#">6.2. Estimated parameters with their intervals</a>	26
<a href="#">6.3. Identifiability analisys</a>	27
<a href="#">6.4. Uncertainty analisys</a>	30
<a href="#">Chapter 7. Extension number7</a>	31
<a href="#">7.1. Basic information</a>	31
<a href="#">7.2. Estimated parameters with their intervals</a>	31
<a href="#">7.3. Identifiability analisys</a>	32
<a href="#">7.4. Uncertainty analisys</a>	35
<a href="#">Chapter 8. Extension number8</a>	36
<a href="#">8.1. Basic information</a>	36
<a href="#">8.2. Estimated parameters with their intervals</a>	36
<a href="#">8.3. Identifiability analisys</a>	37
<a href="#">8.4. Uncertainty analisys</a>	40
<a href="#">Chapter 9. Extension number9</a>	41
<a href="#">9.1. Basic information</a>	41
<a href="#">9.2. Estimated parameters with their intervals</a>	41

<a href="#">9.3. Identifiability analysis</a> .....	42
<a href="#">9.4. Uncertainty analysis</a> .....	45
Chapter 10. <a href="#">Extension number10</a> .....	46
<a href="#">10.1. Basic information</a> .....	46
<a href="#">10.2. Estimated parameters with their intervals</a> .....	46
<a href="#">10.3. Identifiability analysis</a> .....	47
<a href="#">10.4. Uncertainty analysis</a> .....	50
Chapter 11. <a href="#">Extension number11</a> .....	51
<a href="#">11.1. Basic information</a> .....	51
<a href="#">11.2. Estimated parameters with their intervals</a> .....	51
<a href="#">11.3. Identifiability analysis</a> .....	52
<a href="#">11.4. Uncertainty analysis</a> .....	55
Chapter 12. <a href="#">Extension number12</a> .....	56
<a href="#">12.1. Basic information</a> .....	56
<a href="#">12.2. Estimated parameters with their intervals</a> .....	56
<a href="#">12.3. Identifiability analysis</a> .....	57
<a href="#">12.4. Uncertainty analysis</a> .....	60
Chapter 13. <a href="#">Extension number13</a> .....	61
<a href="#">13.1. Basic information</a> .....	61
<a href="#">13.2. Estimated parameters with their intervals</a> .....	61
<a href="#">13.3. Identifiability analysis</a> .....	62
<a href="#">13.4. Uncertainty analysis</a> .....	65
Chapter 14. <a href="#">Extension number14</a> .....	66
<a href="#">14.1. Basic information</a> .....	66
<a href="#">14.2. Estimated parameters with their intervals</a> .....	66
<a href="#">14.3. Identifiability analysis</a> .....	67
<a href="#">14.4. Uncertainty analysis</a> .....	70
Chapter 15. <a href="#">Extension number15</a> .....	71
<a href="#">15.1. Basic information</a> .....	71
<a href="#">15.2. Estimated parameters with their intervals</a> .....	71
<a href="#">15.3. Identifiability analysis</a> .....	72
<a href="#">15.4. Uncertainty analysis</a> .....	75

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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 91. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

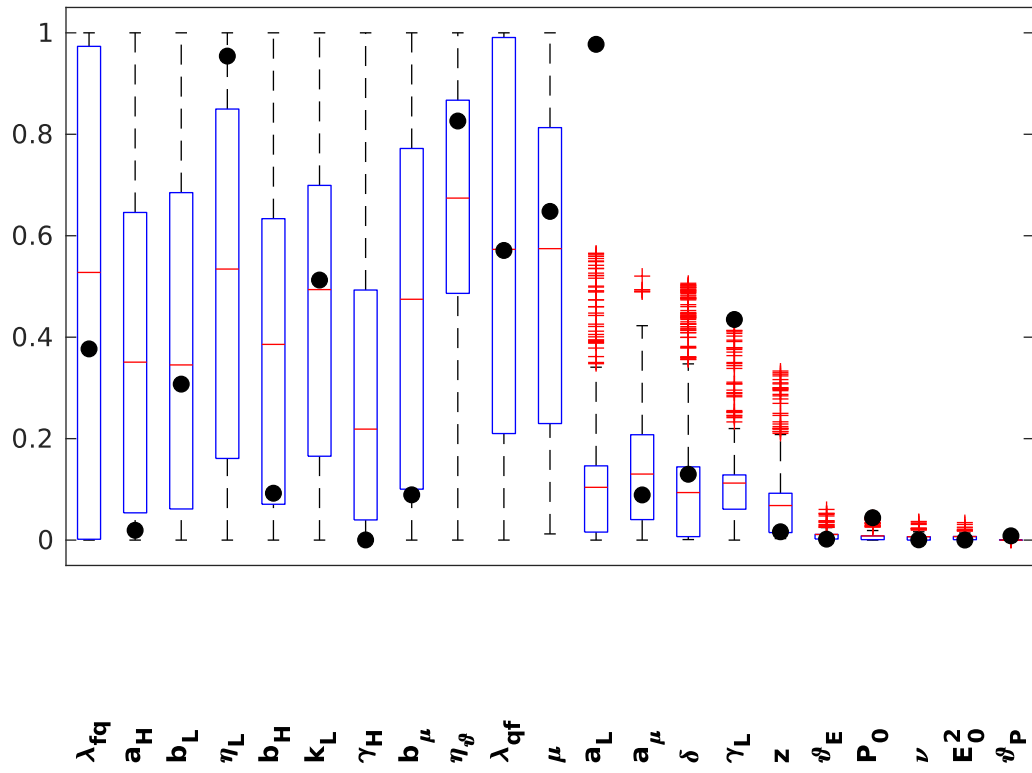
### 1.2. Estimated parameters with their intervals

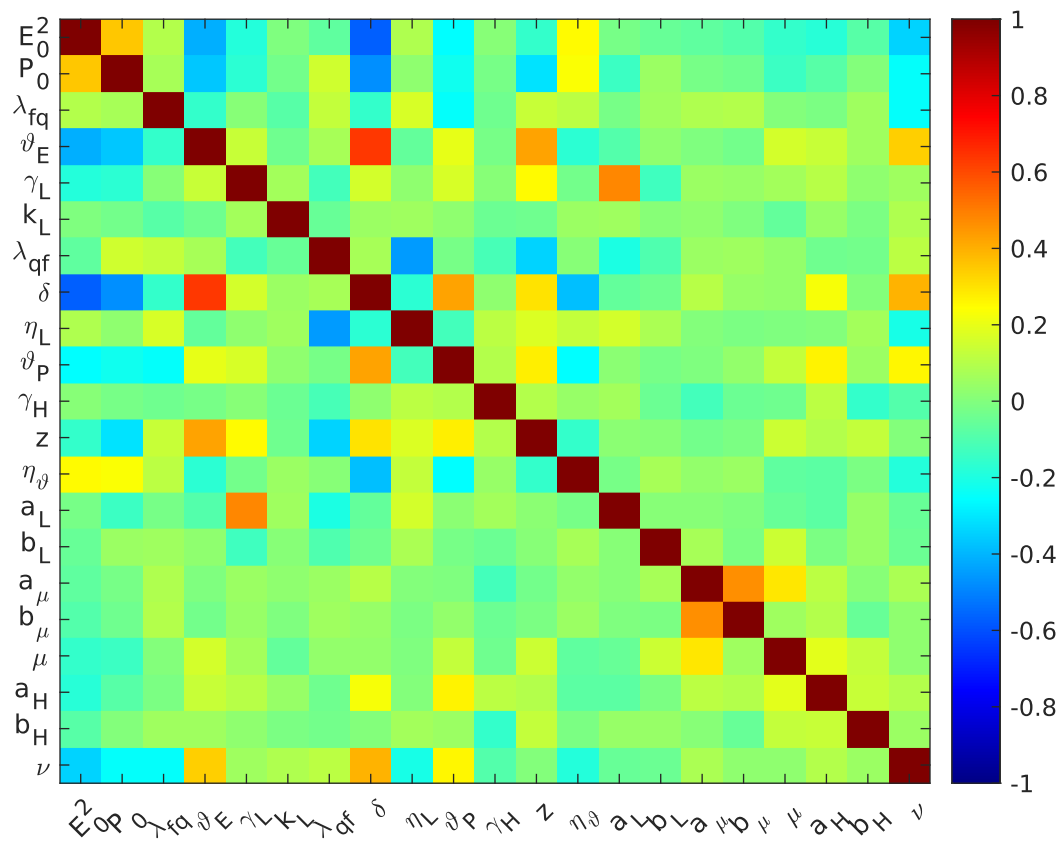
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

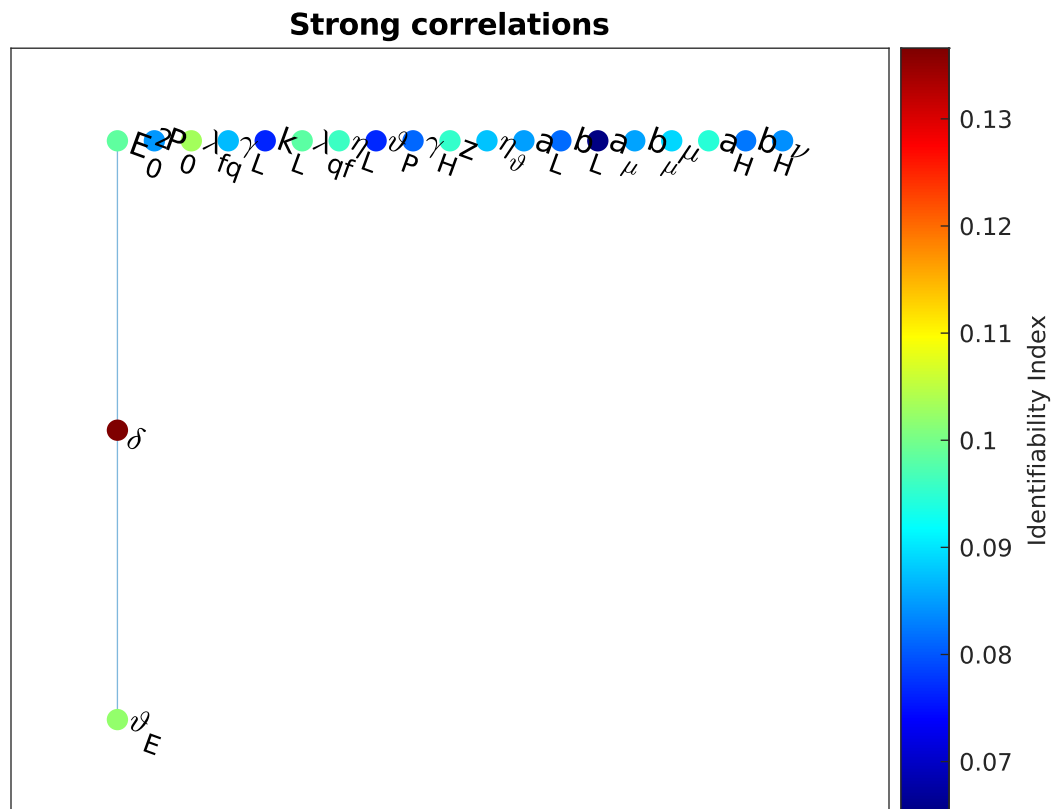
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$E^2_0$	'0.0167'	'0.3386'	'14.189'	'0.1505'	'0.0984'
$P_0$	'16.3501'	'19.6'	'3.3192'	'17.6419'	'0.0846'
$\lambda_{fq}$	'0.3544'	'0.3813'	'0.5277'	'0.3769'	'0.1032'
$\vartheta_E$	'0.0001'	'0.0043'	'0.0112'	'0.0019'	'0.1023'
$\gamma_L$	'0.2376'	'0.7819'	'0.1126'	'0.4349'	'0.0871'
$k_L$	'1'	'8.866'	'5.4445'	'5.6139'	'0.0766'
$\lambda_{qf}$	'0.5458'	'0.587'	'0.5731'	'0.571'	'0.0982'
$\delta$	'0.0179'	'0.0246'	'0.0142'	'0.0195'	'0.1366'
$\eta_L$	'0.846'	'0.9619'	'0.5343'	'0.9542'	'0.0961'
$\vartheta_P$	'0.0081'	'0.0132'	'0'	'0.0084'	'0.077'
$\gamma_H$	'0'	'0.0007'	'0.2188'	'0.0003'	'0.0814'
$z$	'0.4738'	'0.5036'	'2.0442'	'0.4924'	'0.0956'
$\eta_{\vartheta}$	'0.7918'	'0.8807'	'0.6742'	'0.8261'	'0.0876'
$a_L$	'12.0959'	'15'	'2.4678'	'14.6824'	'0.0851'
$b_L$	'3.6621'	'5.3157'	'5.8345'	'5.3047'	'0.0815'
$a_{\mu}$	'1.343'	'3.8977'	'2.8236'	'2.2468'	'0.0653'
$b_{\mu}$	'1.7876'	'9.1146'	'7.6468'	'2.2495'	'0.0854'
$\mu$	'0.2144'	'1'	'0.5745'	'0.648'	'0.089'
$a_H$	'1'	'11.206'	'5.9111'	'1.2702'	'0.0946'
$b_H$	'1.35'	'14.3175'	'6.4013'	'2.2937'	'0.0824'
$\nu$	'0.0221'	'0.5266'	'3.3713'	'0.2588'	'0.084'

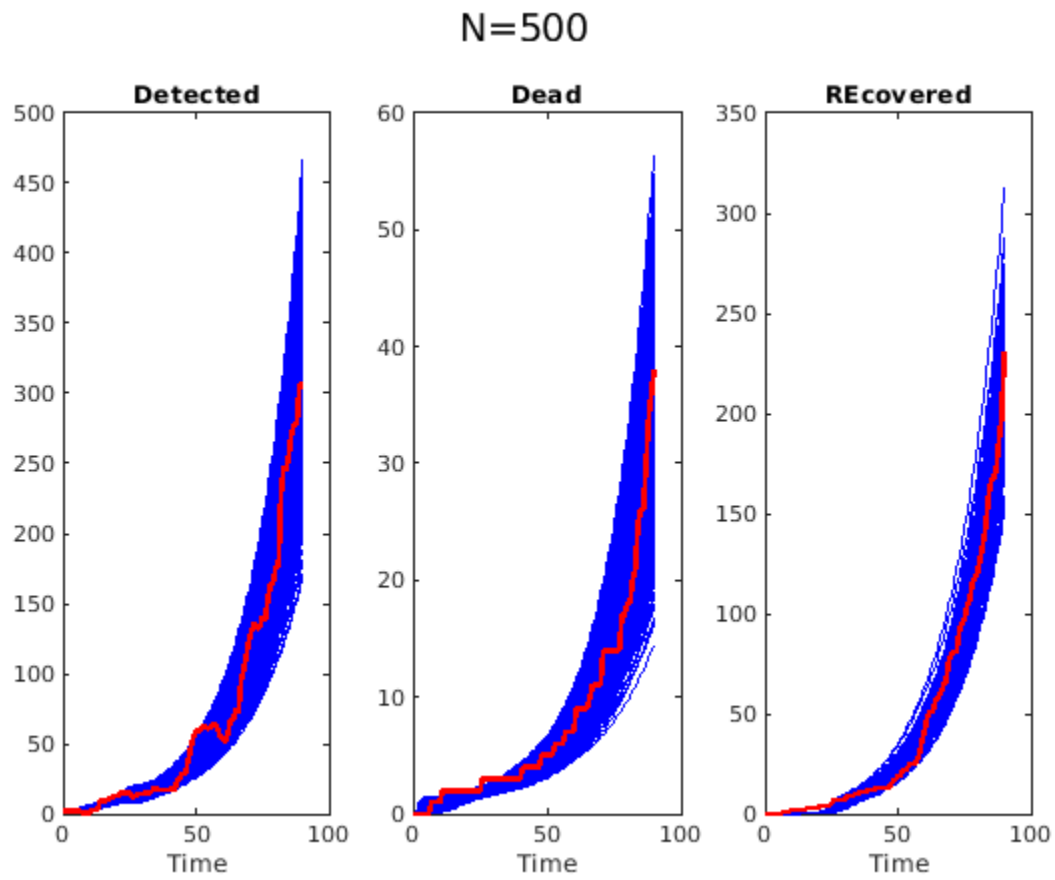
### 1.3. Identifiability analysis







## 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 data91 to the 122. The status of the validation is: COMPLETED.

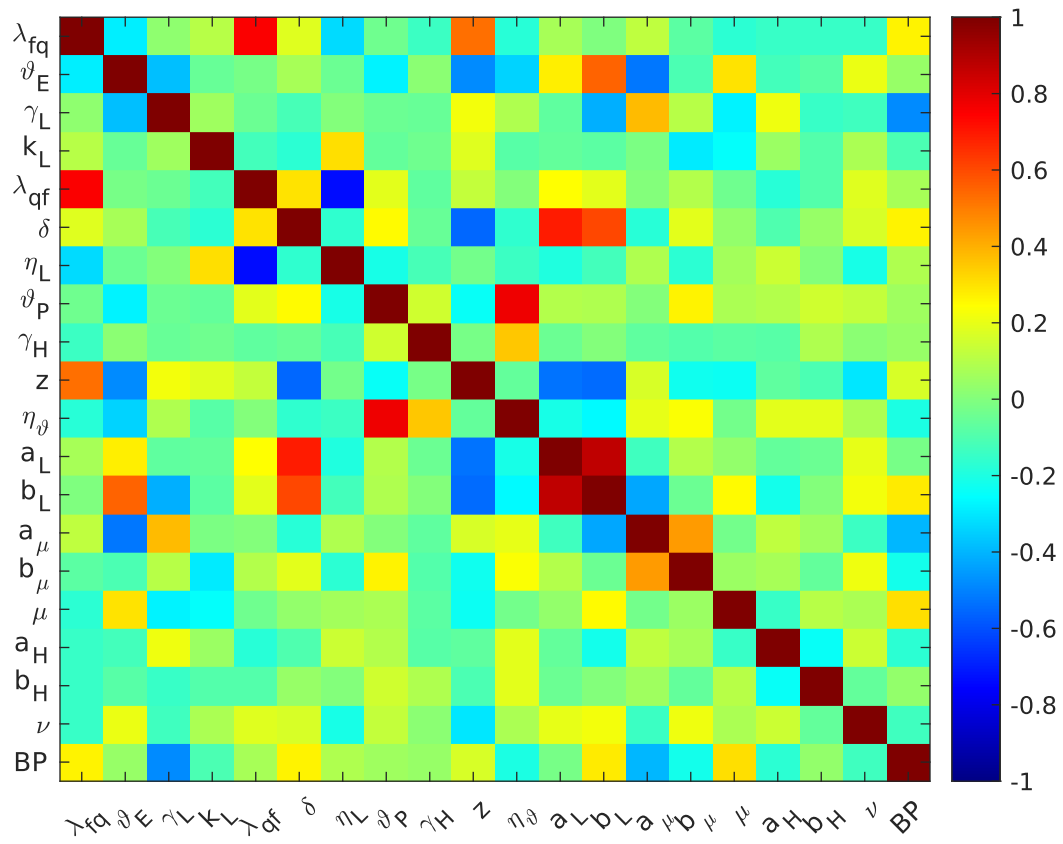
The number of estimations needed to perform the validation was2000.

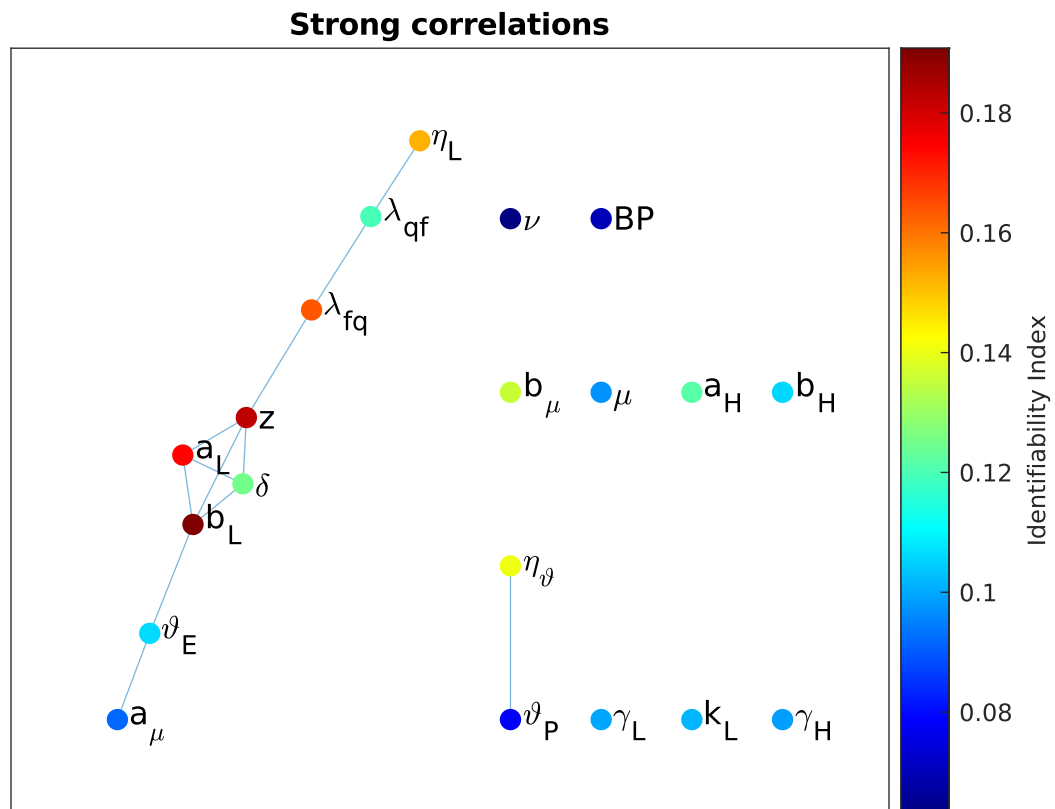
### 2.2. Estimated parameters with their intervals

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

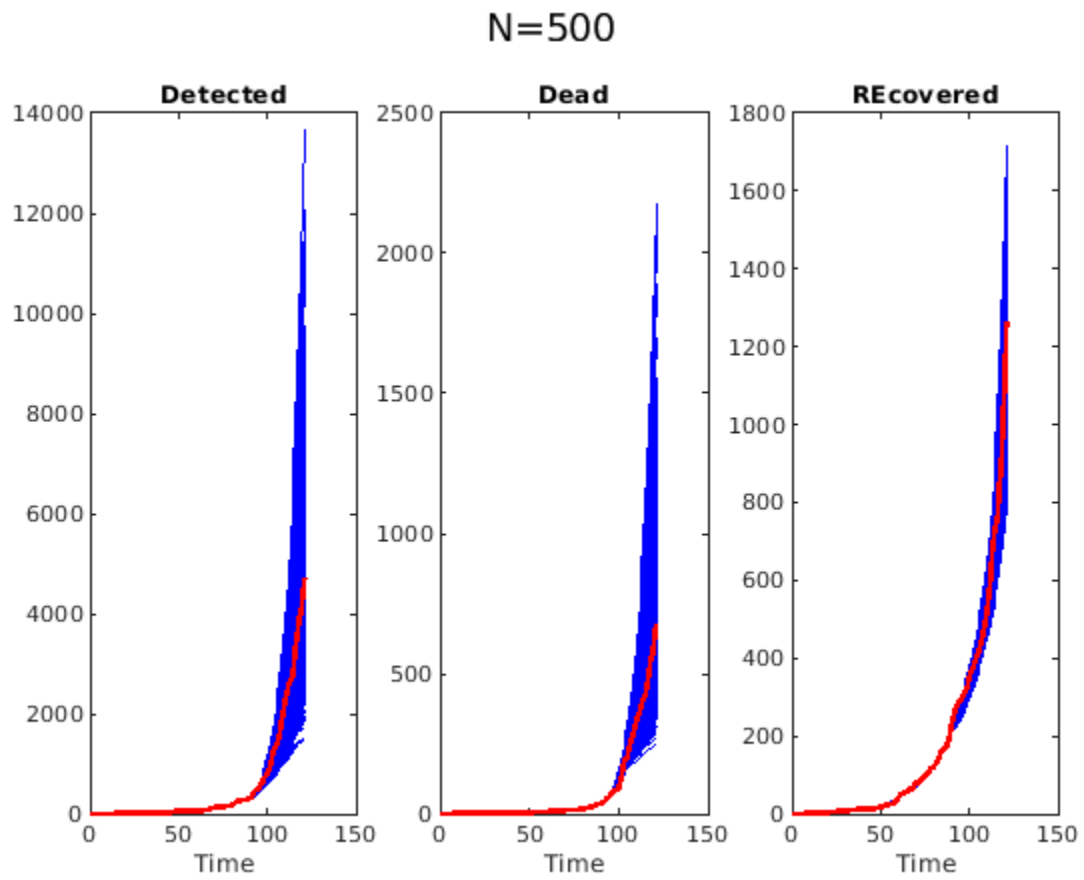
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.2627'	'0.3977'	'0.3302'	'0.3666'	'0.1637'
$\vartheta_E$	'0.037'	'0.0449'	'0.0409'	'0.0332'	'0.1062'
$\gamma_L$	'0.086'	'0.1544'	'0.1202'	'0.123'	'0.0997'
$k_L$	'4.9544'	'5.8433'	'5.3988'	'6.2234'	'0.1018'
$\lambda_{qf}$	'0.05'	'0.1033'	'0.0766'	'0.0396'	'0.1198'
$\delta$	'0.0226'	'0.0254'	'0.024'	'0.0135'	'0.1255'
$\eta_L$	'0.743'	'0.8938'	'0.8184'	'0.9967'	'0.1521'
$\vartheta_P$	'0.0015'	'0.0037'	'0.0026'	'0.0002'	'0.0786'
$\gamma_H$	'0.4284'	'0.5388'	'0.4836'	'0.4816'	'0.099'
$z$	'6.8413'	'9.7125'	'8.2769'	'19.8249'	'0.1825'
$\eta_{\vartheta}$	'0.6974'	'0.8096'	'0.7535'	'0.6085'	'0.1408'
$a_L$	'10.9242'	'12.6674'	'11.7958'	'5.0479'	'0.174'
$b_L$	'5.7848'	'7.2213'	'6.5031'	'2.2305'	'0.1908'
$a_{\mu}$	'1.5263'	'1.843'	'1.6846'	'1.7901'	'0.0921'
$b_{\mu}$	'6.7996'	'8.83'	'7.8148'	'2.8549'	'0.1357'
$\mu$	'0.725'	'0.8055'	'0.7653'	'0.8407'	'0.0972'
$a_H$	'7.5219'	'9.346'	'8.434'	'9.1067'	'0.1219'
$b_H$	'6.7107'	'8.3602'	'7.5355'	'7.1399'	'0.1056'
$\nu$	'0'	'2.8437'	'0.4662'	'0.0042'	'0.0633'
BP	'90.1484'	'90.8516'	'90.5'	'91.4998'	'0.0699'







## 2.4. Uncertainty analysys



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## Chapter 3. Extension number3

### 3.1. Basic information

The extension to be validated consists of the time series from the data122 to the 143. The status of the validation is: COMPLETED.

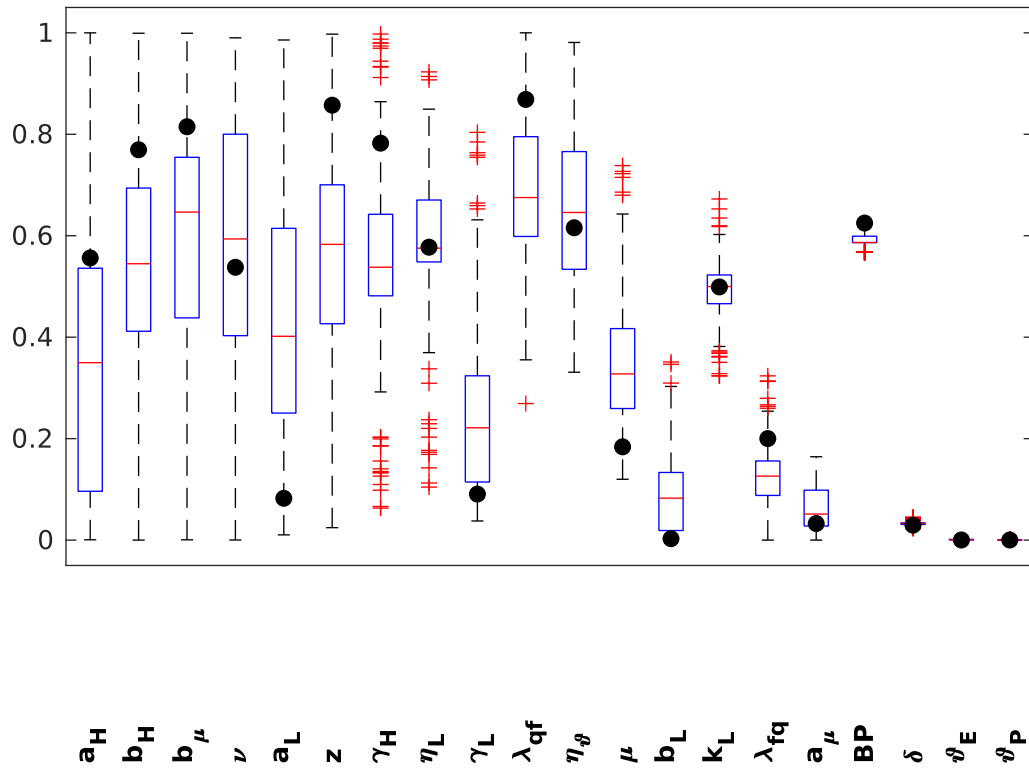
The number of estimations needed to perform the validation was1000.

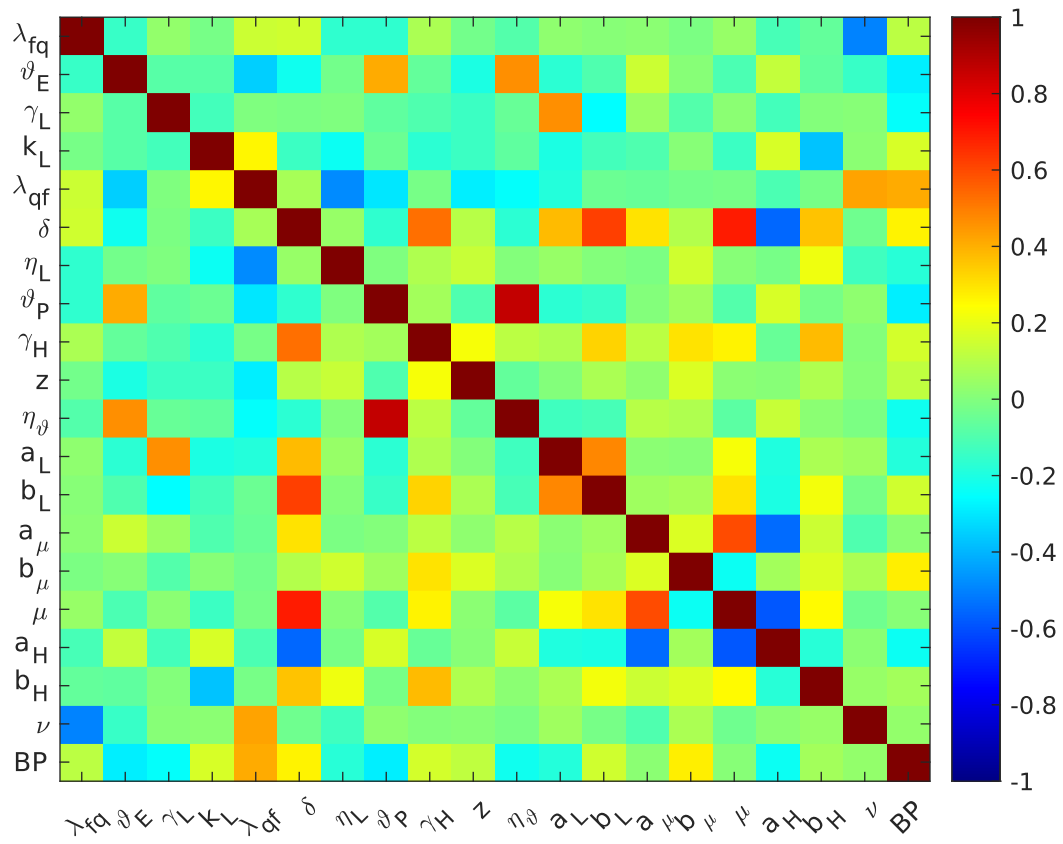
### 3.2. Estimated parameters with their intervals

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

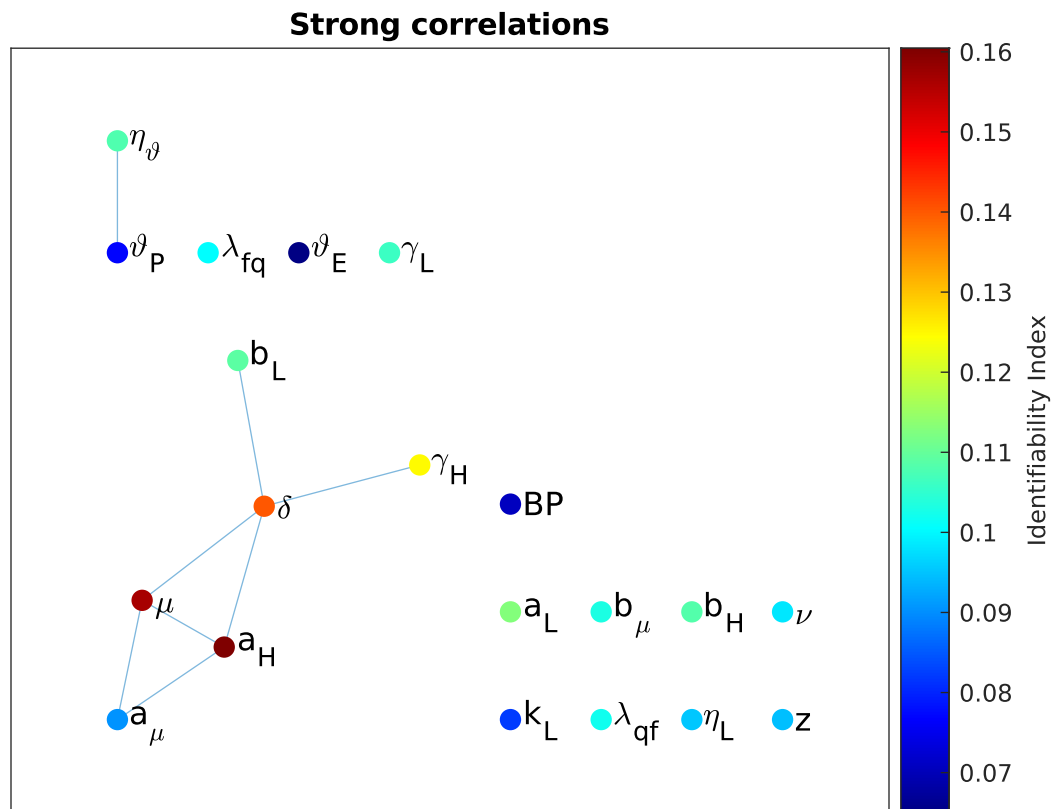
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0747'	'0.1779'	'0.1263'	'0.2001'	'0.1005'
$\vartheta_E$	'0.0004'	'0.0009'	'0.0006'	'0.0002'	'0.0651'
$\gamma_L$	'0.1643'	'0.2798'	'0.2221'	'0.0907'	'0.1061'
$k_L$	'5.2705'	'5.7266'	'5.4985'	'5.4918'	'0.0826'
$\lambda_{qf}$	'0.641'	'0.7089'	'0.6749'	'0.8687'	'0.102'
$\delta$	'0.0044'	'0.0056'	'0.005'	'0.0044'	'0.1401'
$\eta_L$	'0.5295'	'0.6216'	'0.5755'	'0.5774'	'0.0956'
$\vartheta_P$	'0.0001'	'0.0006'	'0.0004'	'0.0002'	'0.0771'
$\gamma_H$	'0.4897'	'0.5858'	'0.5377'	'0.7825'	'0.1248'
$z$	'16.1382'	'18.8414'	'17.4898'	'25.7207'	'0.0945'
$\eta_{\vartheta}$	'0.6131'	'0.6786'	'0.6459'	'0.6157'	'0.1082'
$a_L$	'5.9371'	'7.3127'	'6.6249'	'2.1539'	'0.113'
$b_L$	'1.7649'	'2.6018'	'2.1833'	'1.0392'	'0.1091'
$a_{\mu}$	'1.6027'	'1.8402'	'1.7215'	'1.4575'	'0.0907'
$b_{\mu}$	'9.3305'	'10.7744'	'10.0524'	'12.4078'	'0.1032'
$\mu$	'0.2822'	'0.3768'	'0.3295'	'0.1839'	'0.1564'
$a_H$	'5.1518'	'6.6412'	'5.8965'	'8.7874'	'0.1605'
$b_H$	'7.9473'	'9.3063'	'8.6268'	'11.7726'	'0.1084'
$\nu$	'270.9588'	'322.7453'	'296.8521'	'268.9015'	'0.0982'
BP	'121.3401'	'121.6599'	'121.5'	'123.5'	'0.071'

### 3.3. Identifiability analysis

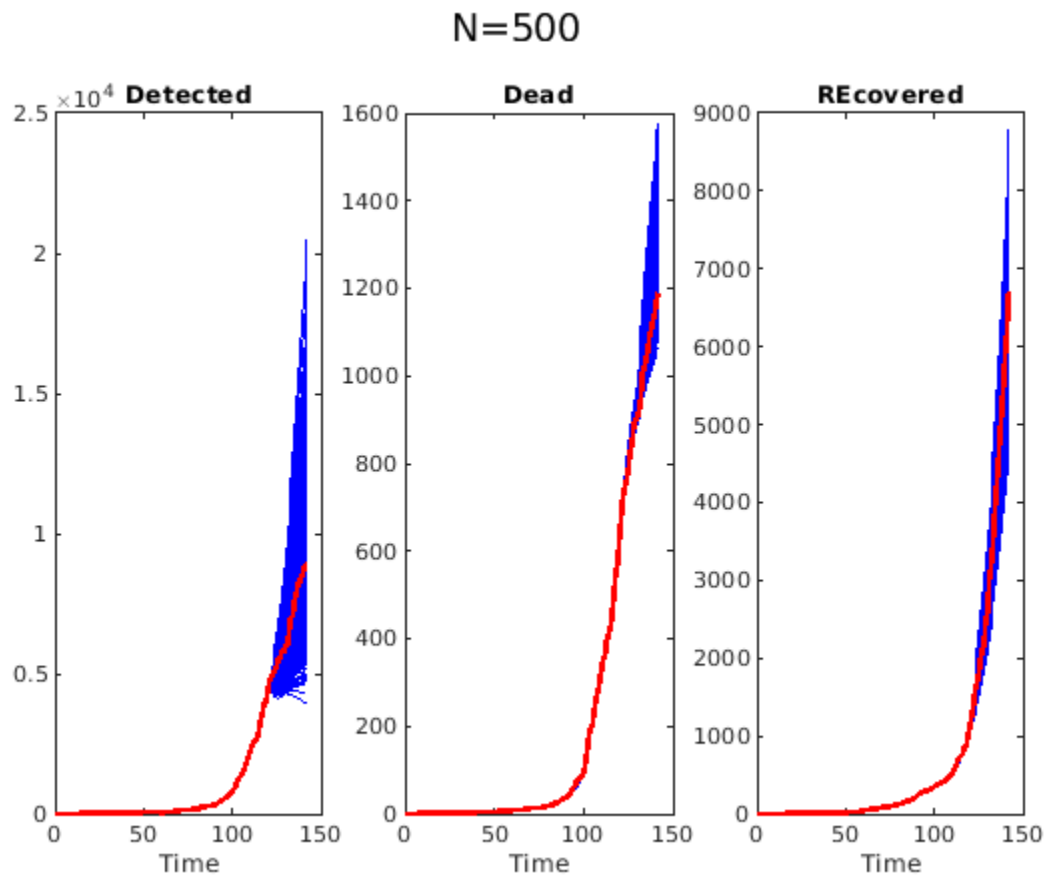








### 3.4. Uncertainty analysys



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## Chapter 4. Extension number4

### 4.1. Basic information

The extension to be validated consists of the time series from the data143 to the 171. The status of the validation is: COMPLETED.

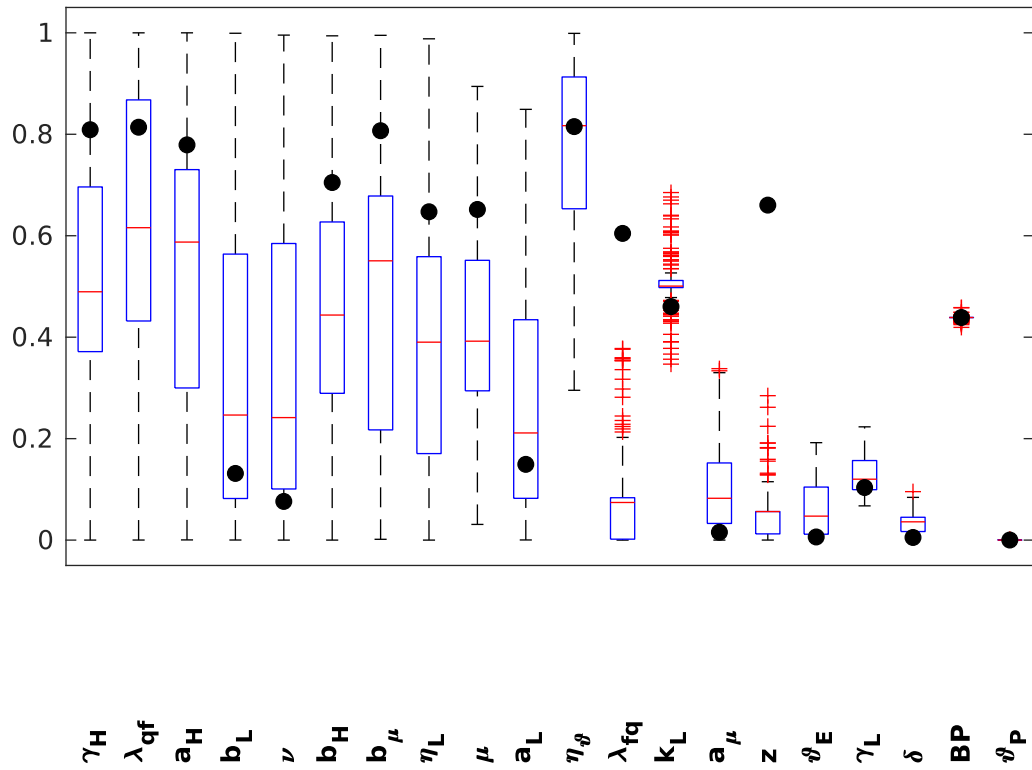
The number of estimations needed to perform the validation was1000.

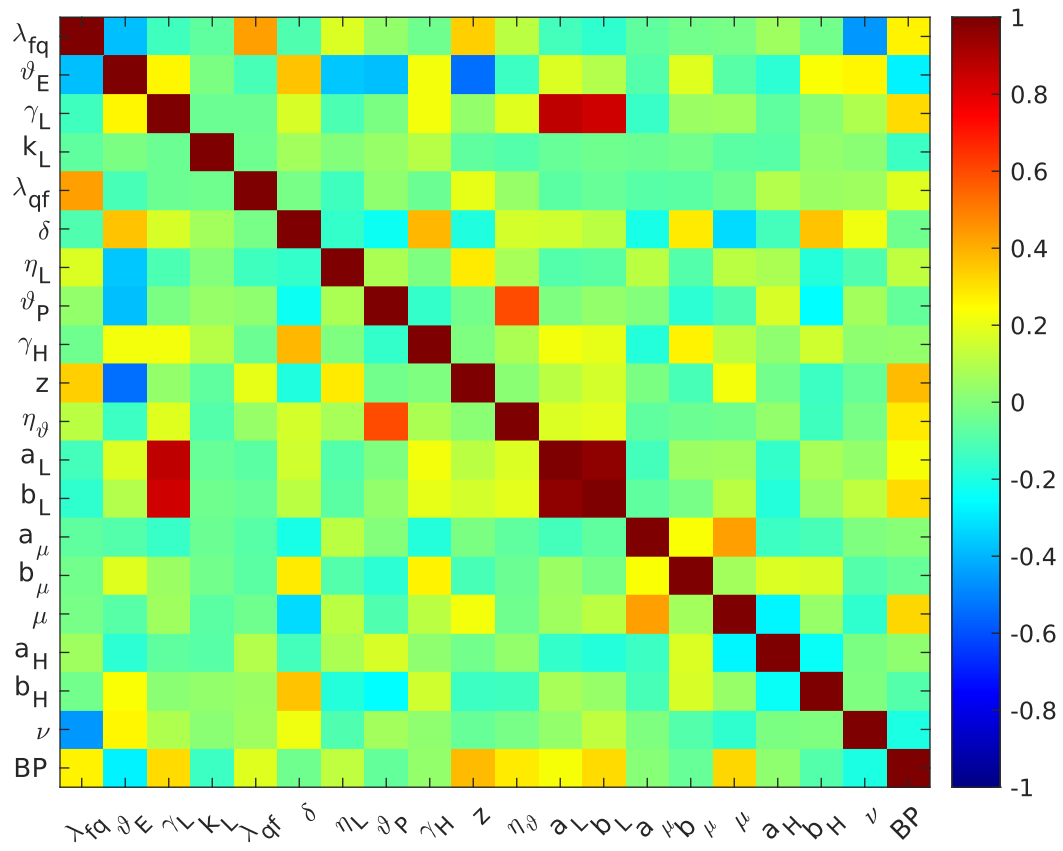
### 4.2. Estimated parameters with their intervals

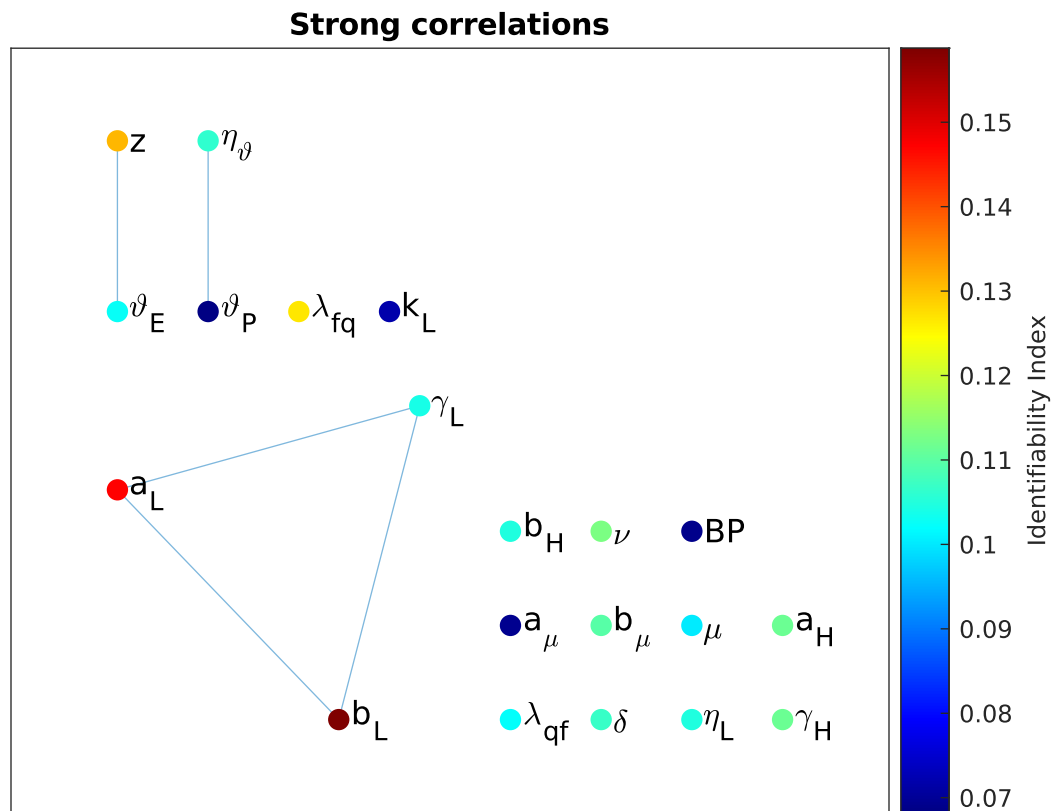
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0099'	'0.1384'	'0.0741'	'0.6046'	'0.1268'
$\vartheta_E$	'0.0362'	'0.0583'	'0.0473'	'0.0062'	'0.1027'
$\gamma_L$	'0.1115'	'0.1286'	'0.1201'	'0.1036'	'0.1042'
$k_L$	'5.2011'	'5.8114'	'5.5063'	'5.1429'	'0.0719'
$\lambda_{qf}$	'0.5607'	'0.671'	'0.6158'	'0.8139'	'0.1025'
$\delta$	'0'	'0.0109'	'0.0054'	'0.0008'	'0.107'
$\eta_L$	'0.3394'	'0.441'	'0.3902'	'0.6472'	'0.1048'
$\vartheta_P$	'0'	'0.0002'	'0.0001'	'0.0001'	'0.0683'
$\gamma_H$	'0.4342'	'0.5449'	'0.4895'	'0.809'	'0.1114'
$z$	'0'	'3.4222'	'1.6878'	'19.8106'	'0.1309'
$\eta_{\vartheta}$	'0.7791'	'0.8548'	'0.817'	'0.8151'	'0.1062'
$a_L$	'3.2517'	'4.6625'	'3.9571'	'3.0904'	'0.1472'
$b_L$	'3.5933'	'5.3095'	'4.4514'	'2.8399'	'0.1588'
$a_{\mu}$	'1.9023'	'2.406'	'2.1542'	'1.2171'	'0.0696'
$b_{\mu}$	'7.9026'	'9.5124'	'8.7075'	'12.2982'	'0.1099'
$\mu$	'0.3502'	'0.434'	'0.3921'	'0.6518'	'0.1002'
$a_H$	'8.387'	'10.0628'	'9.2249'	'11.9076'	'0.1115'
$b_H$	'6.506'	'7.916'	'7.211'	'10.8684'	'0.1048'
$\nu$	'89.2135'	'152.28'	'120.7468'	'38.1148'	'0.1128'
BP	'143.3761'	'143.6239'	'143.5'	'143.5'	'0.0691'

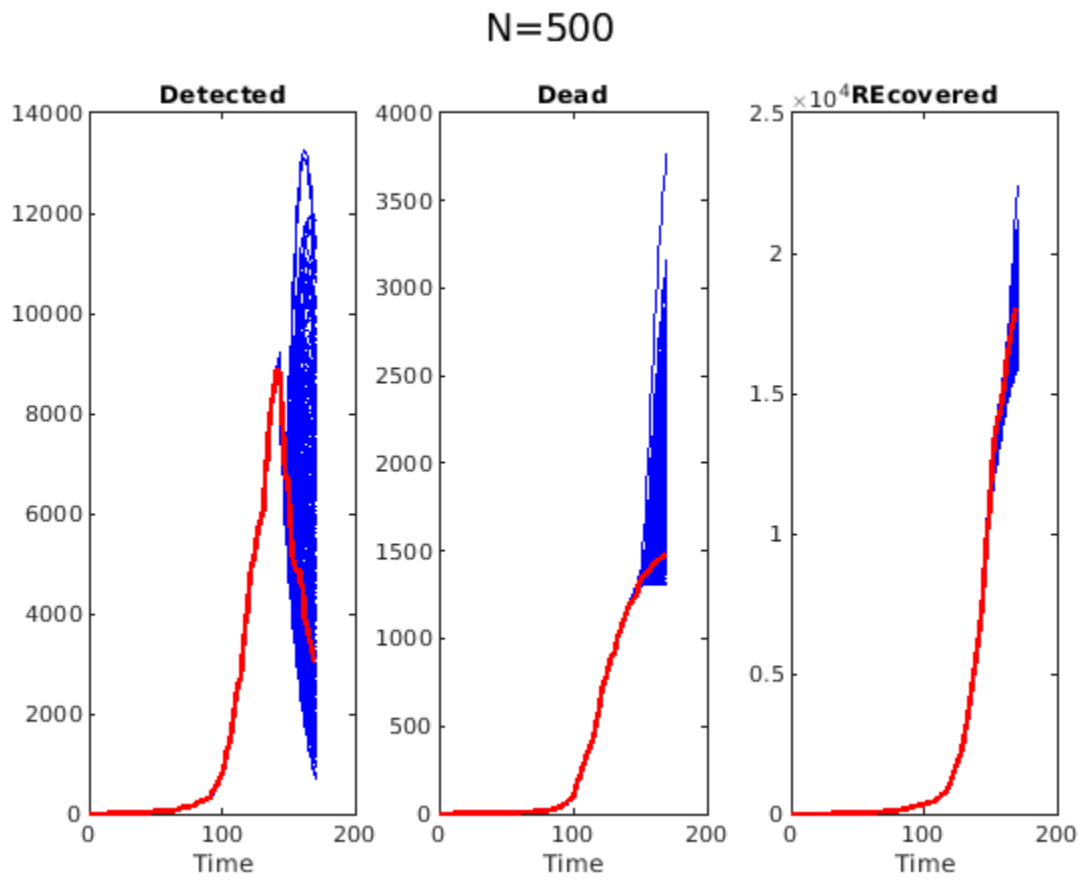
### 4.3. Identifiability analysis







#### 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 data171 to the 273. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was2000.

### 5.2. Estimated parameters with their intervals

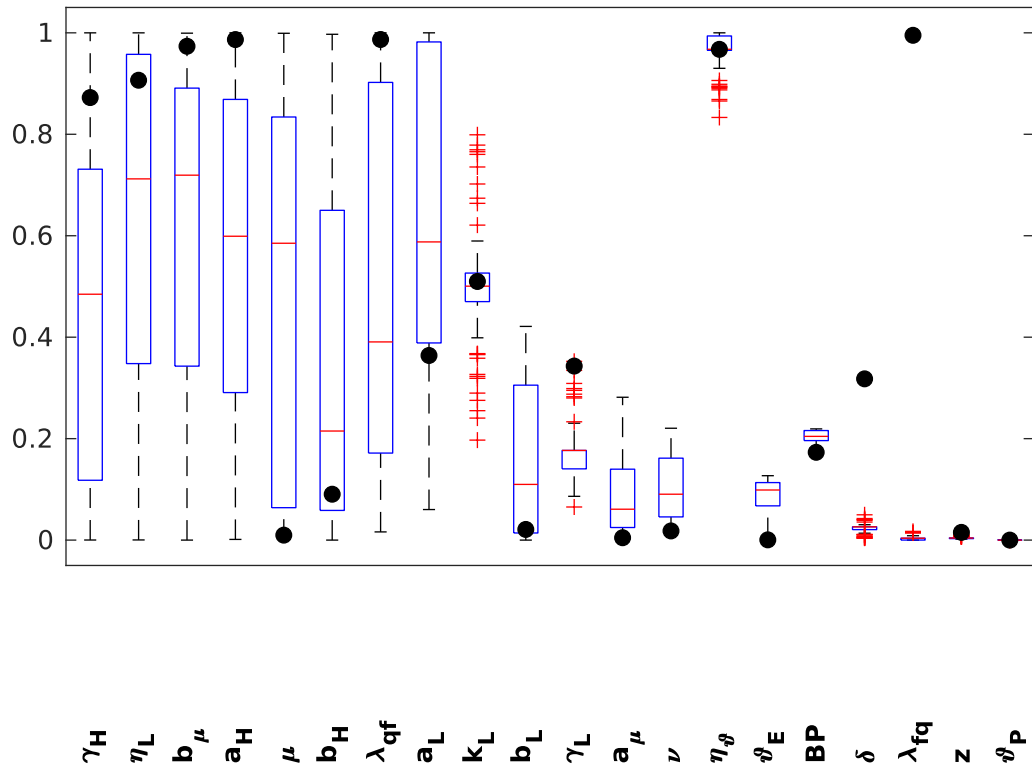
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

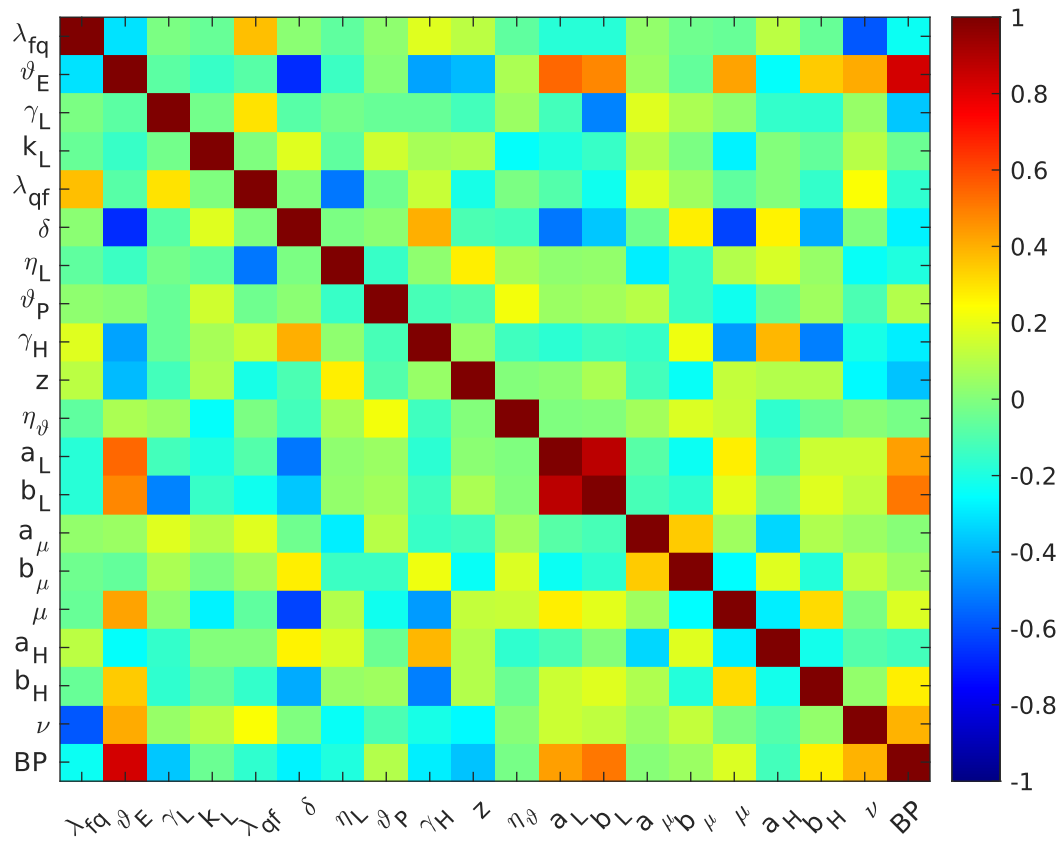
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

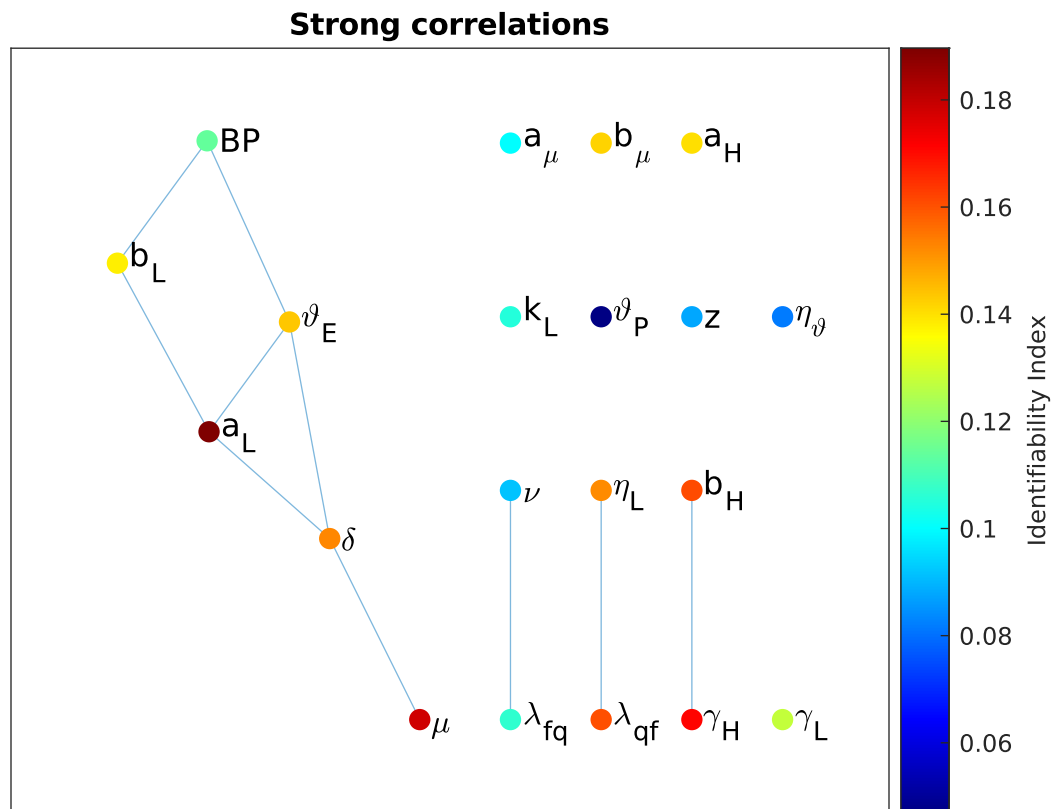
	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.8249'	'1'	'0.0037'	'0.9951'	'0.1068'
\vartheta_E	'0'	'0.0011'	'0.0988'	'0.0005'	'0.1438'
\gamma_L	'0.0675'	'0.4821'	'0.1768'	'0.3431'	'0.1273'
k_L	'1.171'	'9.55'	'5.5053'	'5.5884'	'0.1055'
\lambda_{qf}	'0.8675'	'1'	'0.3907'	'0.9869'	'0.1605'
\delta	'0.0445'	'0.064'	'0.0039'	'0.0477'	'0.1525'
\eta_L	'0.2684'	'0.9707'	'0.7121'	'0.9065'	'0.1523'
\vartheta_P	'0'	'0'	'0'	'0'	'0.047'
\gamma_H	'0.3314'	'0.9291'	'0.4847'	'0.8724'	'0.1709'
z	'0.4526'	'0.6583'	'0.1228'	'0.4569'	'0.0878'
\eta_{\vartheta}	'0.6063'	'1'	'0.9676'	'0.9675'	'0.0821'
a_L	'5.8559'	'11.8771'	'9.2295'	'6.0955'	'0.1897'
b_L	'1.2736'	'4.6523'	'2.537'	'1.2943'	'0.1381'
a_{\mu}	'1'	'11.8864'	'1.8525'	'1.0655'	'0.1003'
b_{\mu}	'2.4871'	'15'	'11.0713'	'14.6289'	'0.1419'
\mu	'0'	'0.0099'	'0.5852'	'0.0098'	'0.1781'
a_H	'9.3293'	'15'	'9.3861'	'14.8141'	'0.1405'
b_H	'2.2403'	'6.3147'	'4.0102'	'2.2663'	'0.1612'
\nu	'8.4505'	'11.9319'	'45.2327'	'9.0358'	'0.092'
BP	'162.5432'	'170.6524'	'169.5822'	'165.4999'	'0.1141'



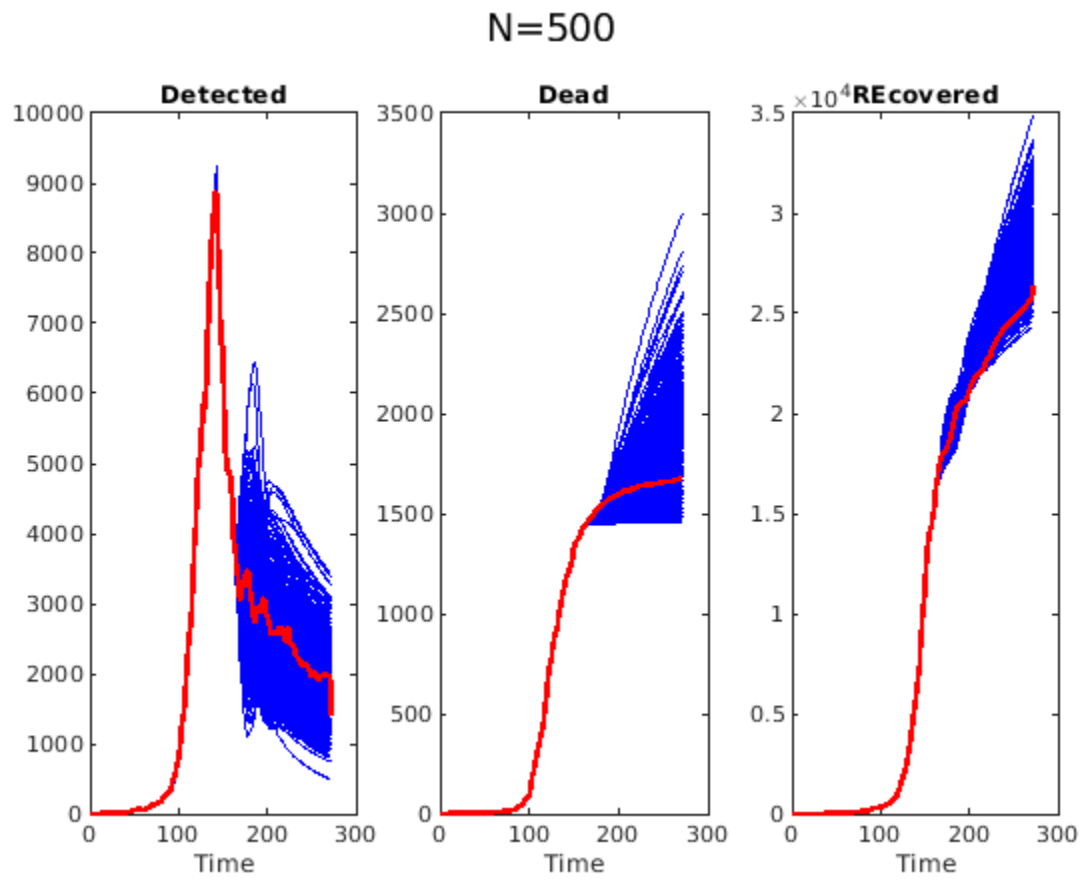
### 5.3. Identifiability analysis







## 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 data273 to the 312. The status of the validation is: COMPLETED.

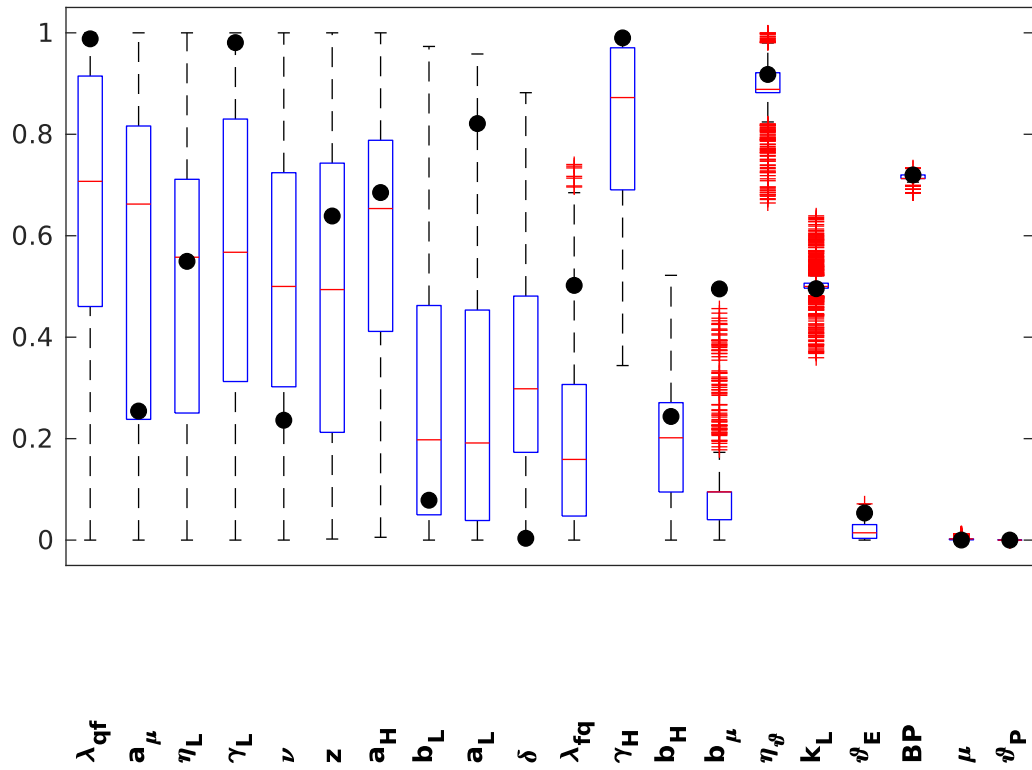
The number of estimations needed to perform the validation was1000.

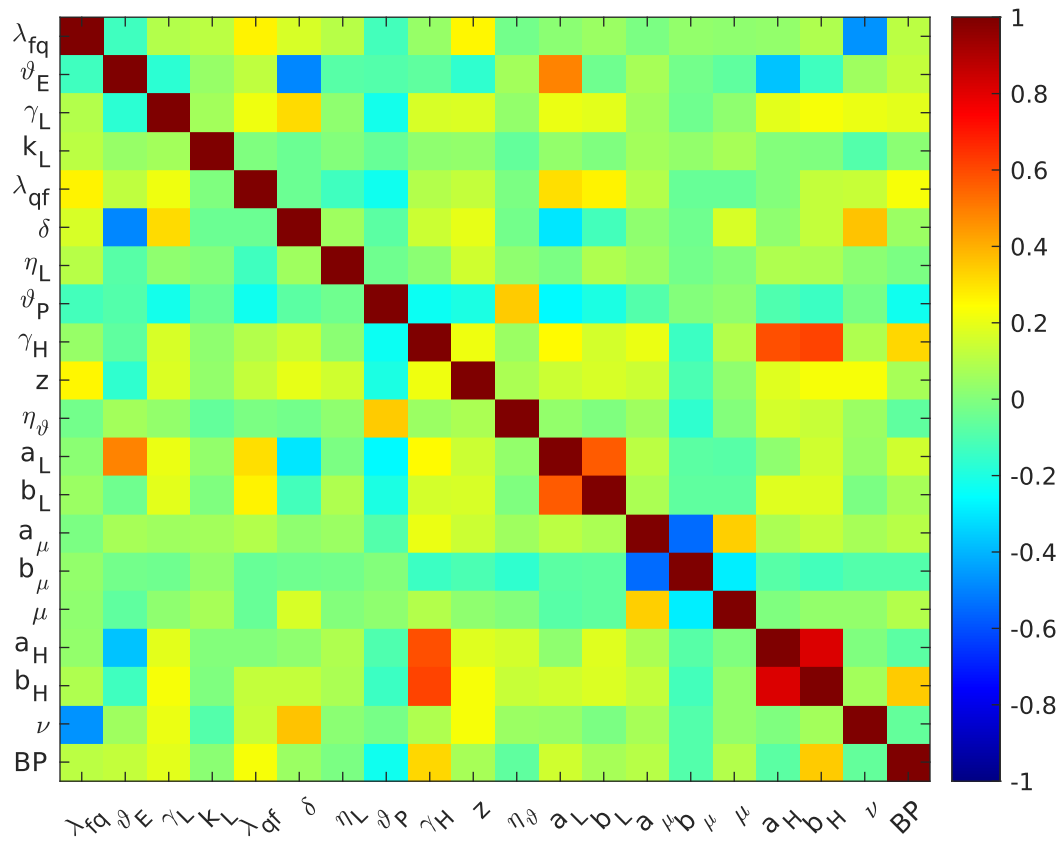
### 6.2. Estimated parameters with their intervals

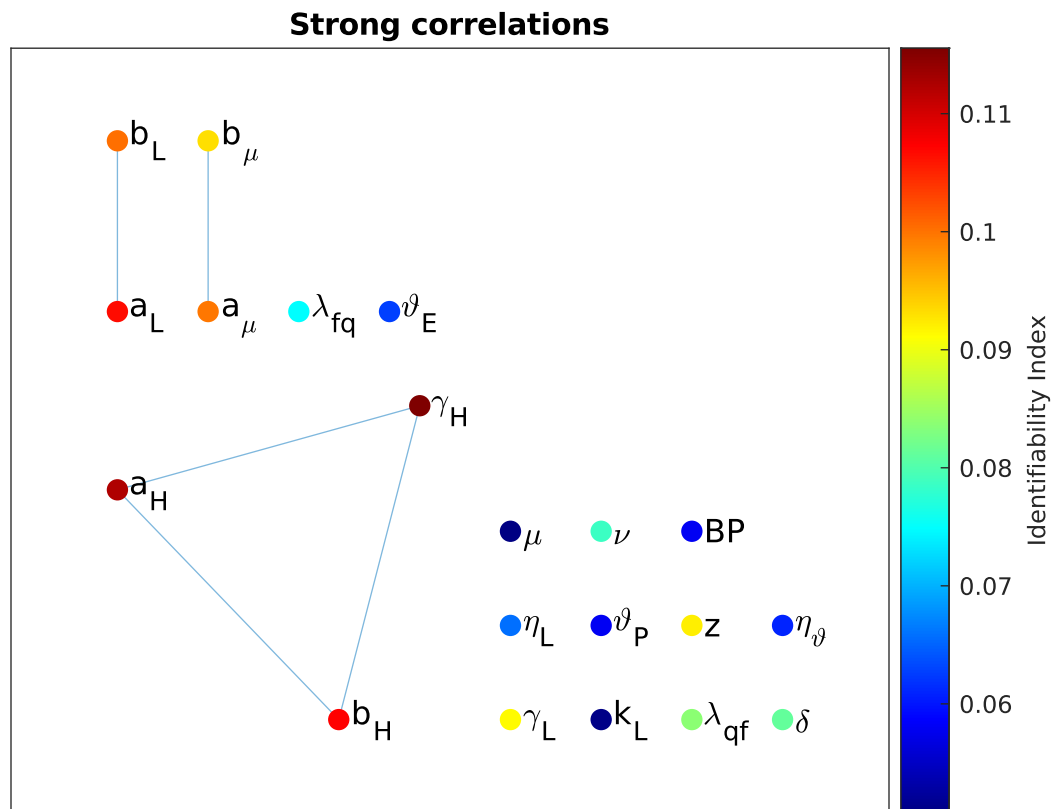
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1365'	'0.1815'	'0.159'	'0.5021'	'0.0749'
$\vartheta_E$	'0.0113'	'0.0175'	'0.0144'	'0.0534'	'0.0629'
$\gamma_L$	'0.5364'	'0.5985'	'0.5674'	'0.9807'	'0.0913'
$k_L$	'5.3523'	'5.6481'	'5.5002'	'5.4608'	'0.0512'
$\lambda_{qf}$	'0.6798'	'0.7346'	'0.7072'	'0.9881'	'0.0839'
$\delta$	'0.0415'	'0.048'	'0.0447'	'0.0005'	'0.0812'
$\eta_L$	'0.5295'	'0.5858'	'0.5576'	'0.5495'	'0.066'
$\vartheta_P$	'0'	'0.0001'	'0'	'0'	'0.0581'
$\gamma_H$	'0.8508'	'0.894'	'0.8724'	'0.99'	'0.1155'
$z$	'13.8929'	'15.7389'	'14.8159'	'19.1666'	'0.0921'
$\eta_{\vartheta}$	'0.8701'	'0.907'	'0.8885'	'0.9179'	'0.061'
$a_L$	'3.2845'	'4.0765'	'3.6805'	'12.4959'	'0.1067'
$b_L$	'3.3325'	'4.2038'	'3.7682'	'2.1002'	'0.1001'
$a_{\mu}$	'9.8162'	'10.7315'	'10.2738'	'4.5617'	'0.0998'
$b_{\mu}$	'1.8998'	'2.7606'	'2.3302'	'7.9325'	'0.0933'
$\mu$	'0'	'0.0138'	'0.0024'	'0.0001'	'0.0508'
$a_H$	'9.8075'	'10.493'	'10.1502'	'10.5916'	'0.1125'
$b_H$	'3.6777'	'3.9695'	'3.8236'	'4.4118'	'0.1073'
$\nu$	'236.3376'	'263.7026'	'250.0201'	'118.1524'	'0.0789'
BP	'271.1784'	'271.8216'	'271.5'	'272.5'	'0.0581'

### 6.3. Identifiability analysis

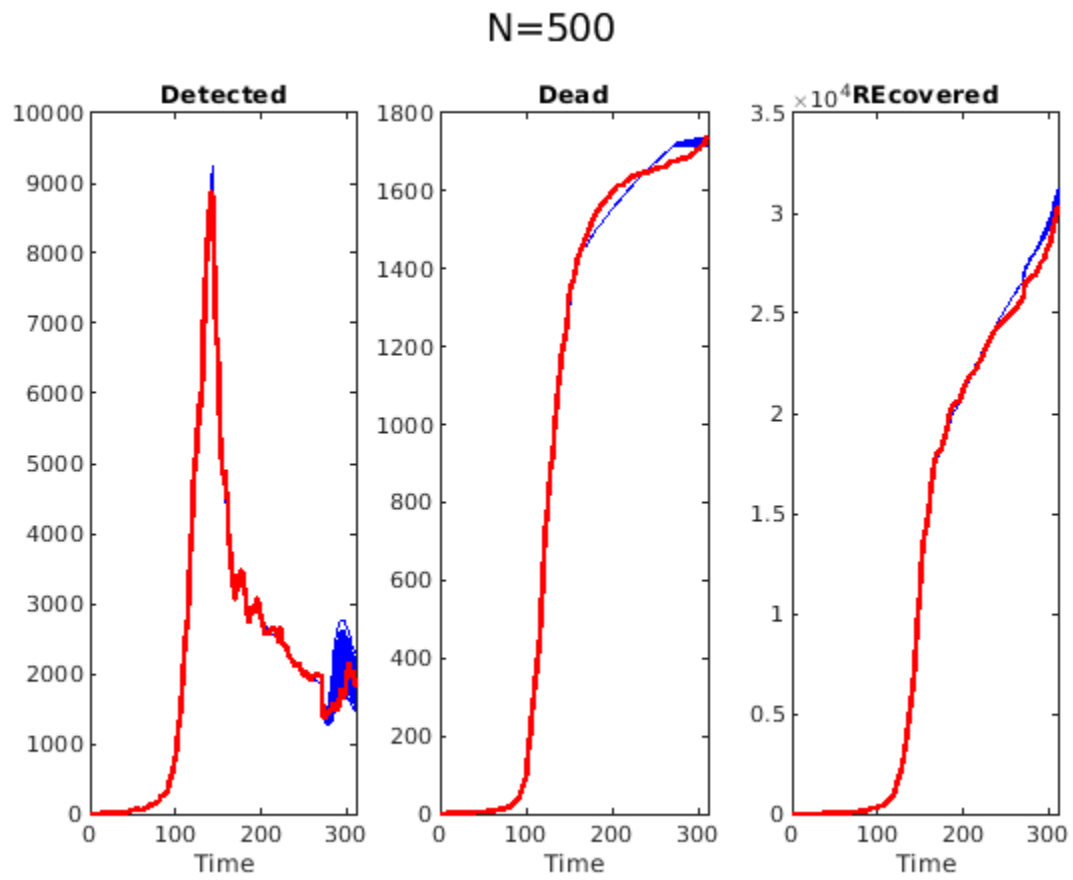








## 6.4. Uncertainty analysis



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## Chapter 7. Extension number7

### 7.1. Basic information

The extension to be validated consists of the time series from the data312 to the 339. The status of the validation is: COMPLETED.

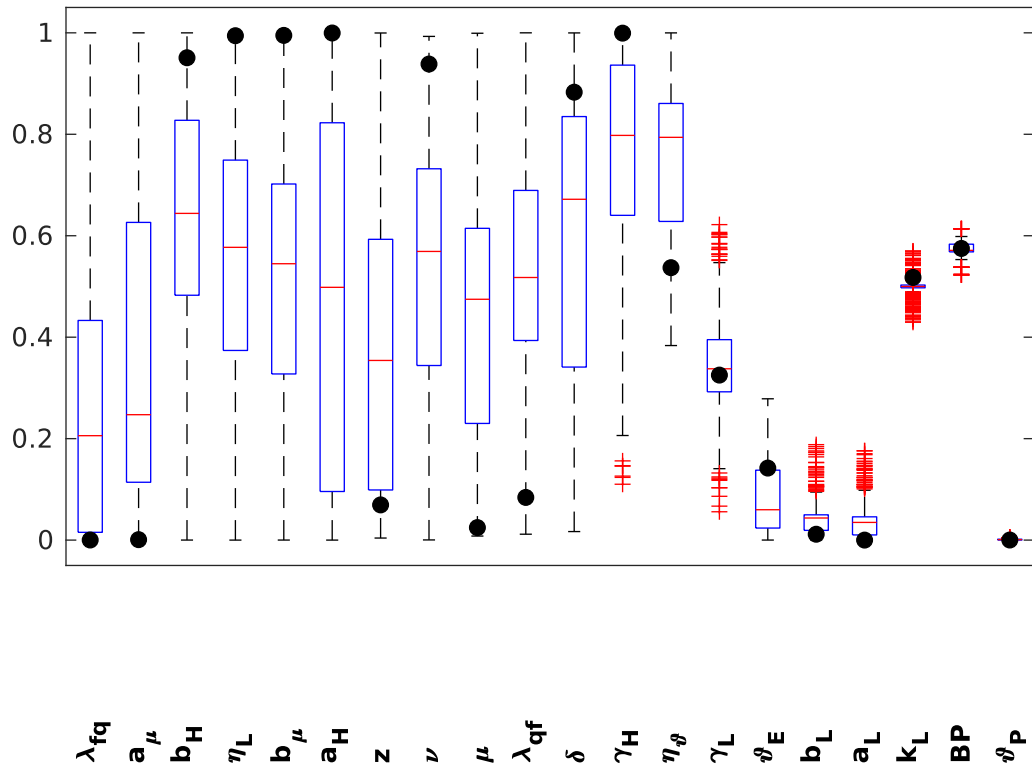
The number of estimations needed to perform the validation was1000.

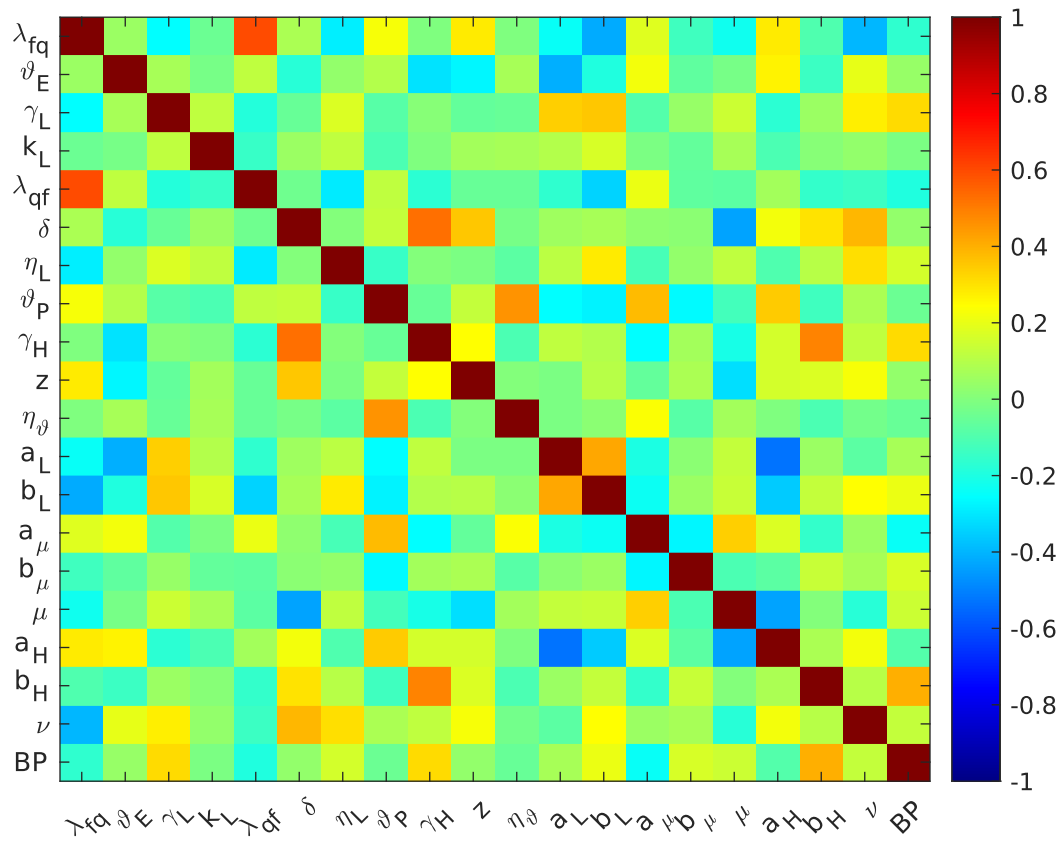
### 7.2. Estimated parameters with their intervals

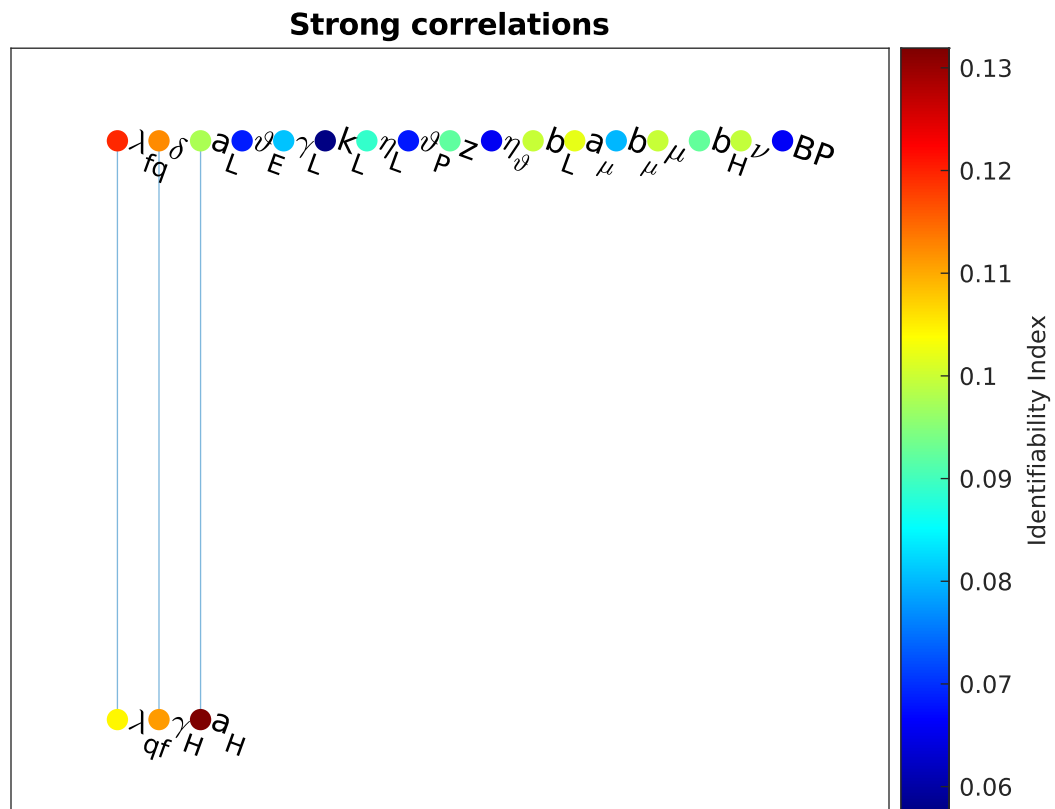
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1732'	'0.2384'	'0.2058'	'0.0002'	'0.1195'
$\vartheta_E$	'0.0511'	'0.0686'	'0.0599'	'0.142'	'0.0686'
$\gamma_L$	'0.3175'	'0.3582'	'0.3378'	'0.3253'	'0.0809'
$k_L$	'5.3586'	'5.6414'	'5.5'	'5.6602'	'0.0575'
$\lambda_{qf}$	'0.4902'	'0.5452'	'0.5177'	'0.0841'	'0.1045'
$\delta$	'0.0952'	'0.1064'	'0.1008'	'0.1324'	'0.1122'
$\eta_L$	'0.5443'	'0.6099'	'0.5771'	'0.9943'	'0.089'
$\vartheta_P$	'0.0006'	'0.0013'	'0.0009'	'0.0002'	'0.0684'
$\gamma_H$	'0.7649'	'0.8305'	'0.7977'	'0.9994'	'0.111'
$z$	'9.6029'	'11.646'	'10.6245'	'2.0814'	'0.0922'
$\eta_{\vartheta}$	'0.7719'	'0.8159'	'0.7939'	'0.537'	'0.0658'
$a_L$	'1.2266'	'1.752'	'1.4893'	'1.0003'	'0.0978'
$b_L$	'1.2805'	'1.9447'	'1.6126'	'1.1618'	'0.0999'
$a_{\mu}$	'3.9822'	'4.9397'	'4.4609'	'1.0121'	'0.1021'
$b_{\mu}$	'8.1704'	'9.0847'	'8.6275'	'14.9296'	'0.0801'
$\mu$	'0.4407'	'0.5088'	'0.4748'	'0.0247'	'0.0998'
$a_H$	'7.327'	'8.6254'	'7.9762'	'14.9952'	'0.1319'
$b_H$	'9.564'	'10.4694'	'10.0167'	'14.3122'	'0.0925'
$\nu$	'267.8556'	'301.1938'	'284.5247'	'469.2291'	'0.0994'
BP	'310.309'	'311.0743'	'310.6916'	'310.9459'	'0.066'

### 7.3. Identifiability analysis

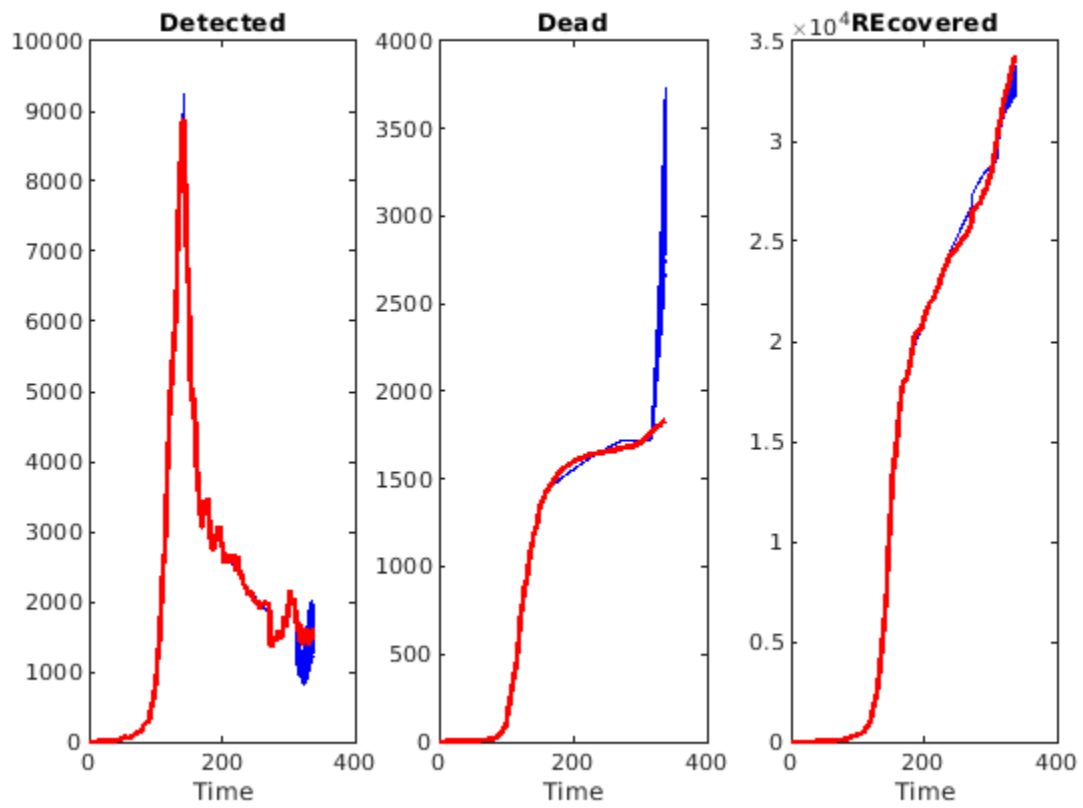






## 7.4. Uncertainty analysis

N=500



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## Chapter 8. Extension number8

### 8.1. Basic information

The extension to be validated consists of the time series from the data339 to the 422. The status of the validation is: COMPLETED.

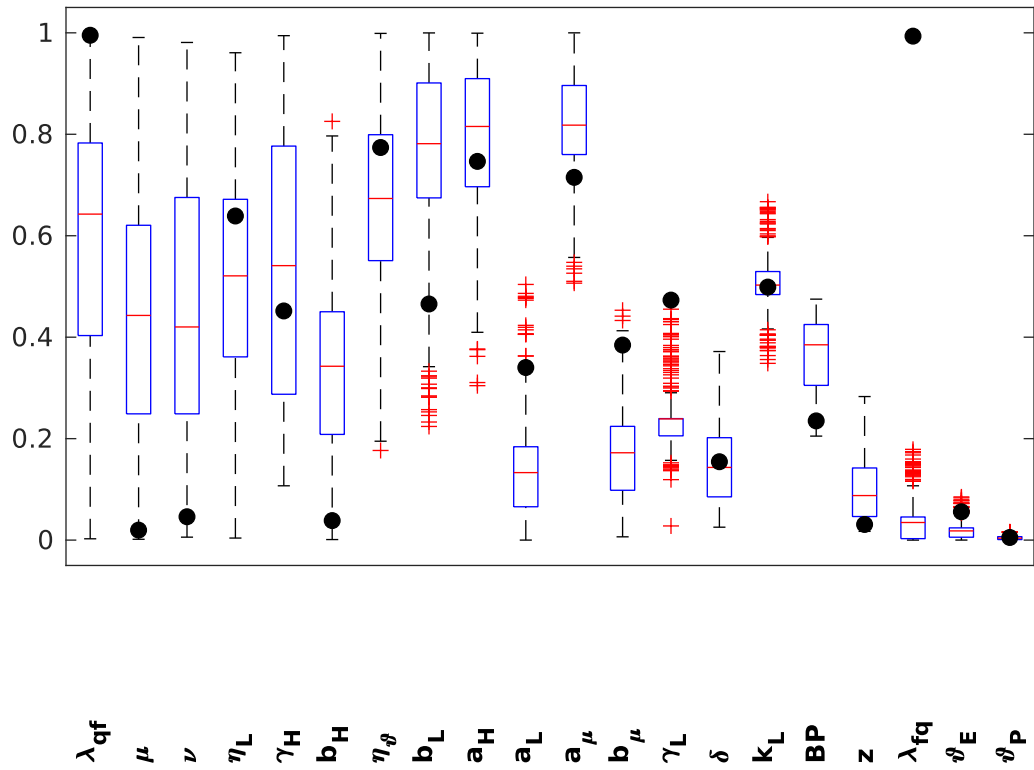
The number of estimations needed to perform the validation was1000.

### 8.2. Estimated parameters with their intervals

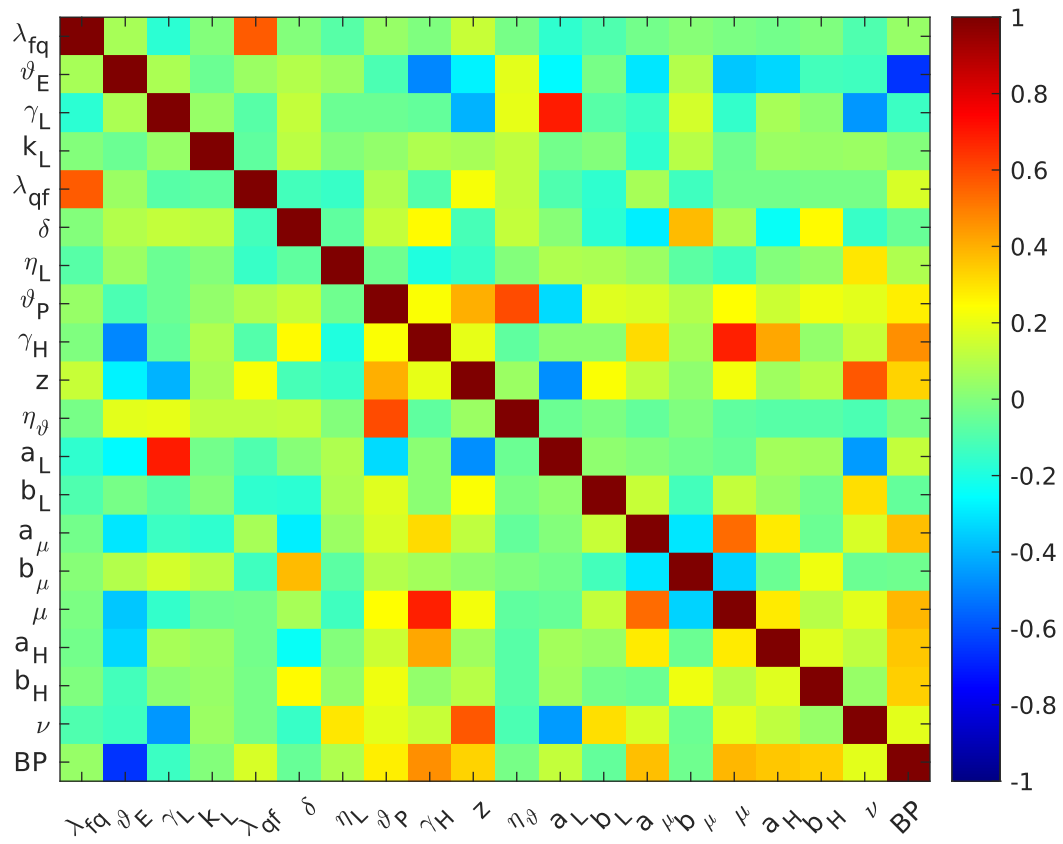
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

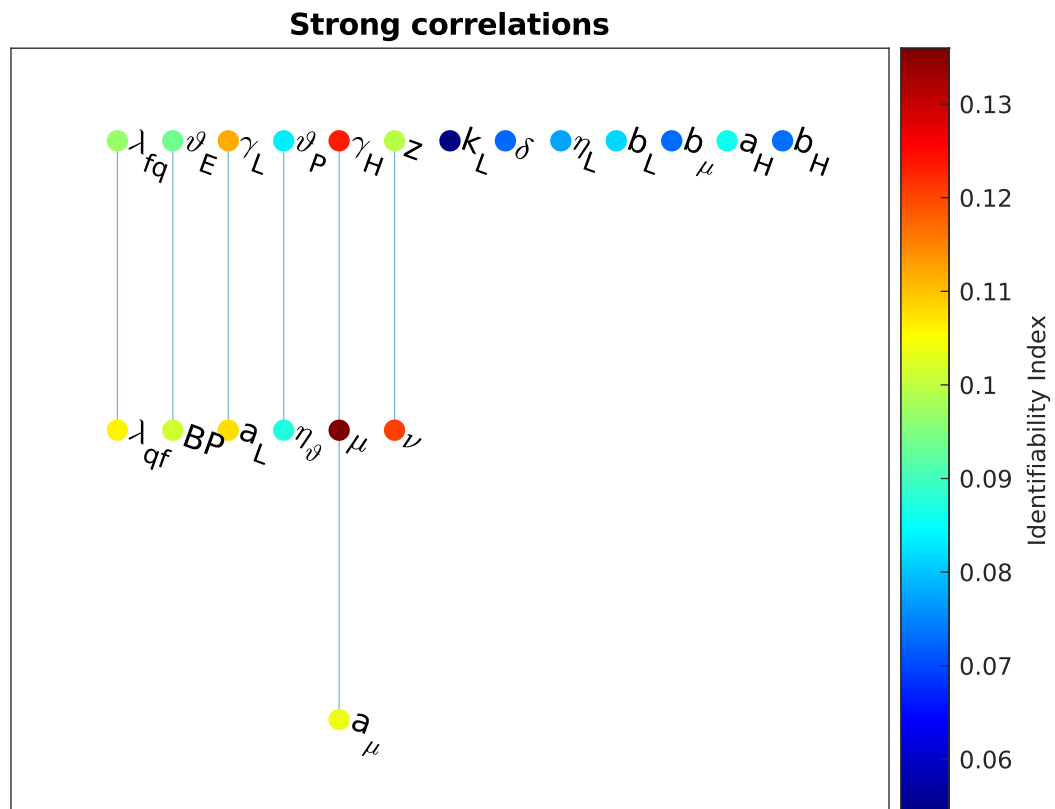
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0787'	'0.0353'	'0.9935'	'0.0969'
$\vartheta_E$	'0.0088'	'0.0275'	'0.0182'	'0.0558'	'0.0936'
$\gamma_L$	'0.2042'	'0.2741'	'0.2392'	'0.4731'	'0.1118'
$k_L$	'5.3801'	'5.669'	'5.5246'	'5.4889'	'0.0543'
$\lambda_{qf}$	'0.6027'	'0.6825'	'0.6426'	'0.9952'	'0.106'
$\delta$	'0.0196'	'0.0235'	'0.0216'	'0.0232'	'0.0728'
$\eta_L$	'0.4885'	'0.5533'	'0.5209'	'0.6389'	'0.0776'
$\vartheta_P$	'0.0025'	'0.0054'	'0.0039'	'0.0052'	'0.0837'
$\gamma_H$	'0.5031'	'0.5791'	'0.5411'	'0.4517'	'0.1235'
$z$	'2.3479'	'2.9207'	'2.6343'	'0.9249'	'0.0994'
$\eta_{\vartheta}$	'0.6481'	'0.6988'	'0.6734'	'0.7739'	'0.0874'
$a_L$	'2.404'	'3.3233'	'2.8636'	'5.7626'	'0.1079'
$b_L$	'11.4804'	'12.3958'	'11.9381'	'7.5163'	'0.0817'
$a_{\mu}$	'12.1438'	'12.7558'	'12.4498'	'11.0111'	'0.1035'
$b_{\mu}$	'3.1398'	'3.6843'	'3.4121'	'6.3825'	'0.0729'
$\mu$	'0.4073'	'0.4785'	'0.4429'	'0.0197'	'0.136'
$a_H$	'12.0547'	'12.7727'	'12.4137'	'11.4519'	'0.0861'
$b_H$	'5.4678'	'6.138'	'5.8029'	'1.5383'	'0.0732'
$\nu$	'191.8508'	'228.3228'	'210.0868'	'23.0254'	'0.1205'
BP	'349.2626'	'351.7374'	'350.5'	'335.5'	'0.1014'

## 8.3. Identifiability analysis

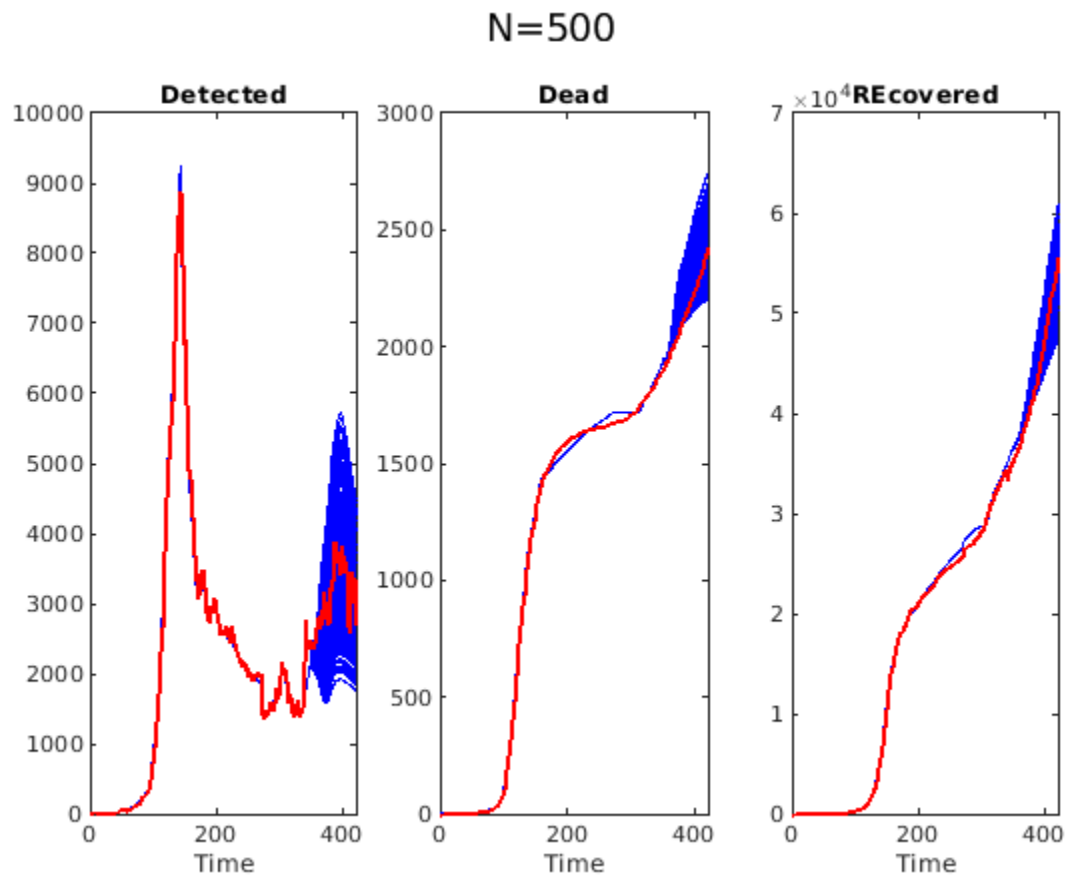








## 8.4. Uncertainty analysis



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## Chapter 9. Extension number9

### 9.1. Basic information

The extension to be validated consists of the time series from the data422 to the 443. The status of the validation is: COMPLETED.

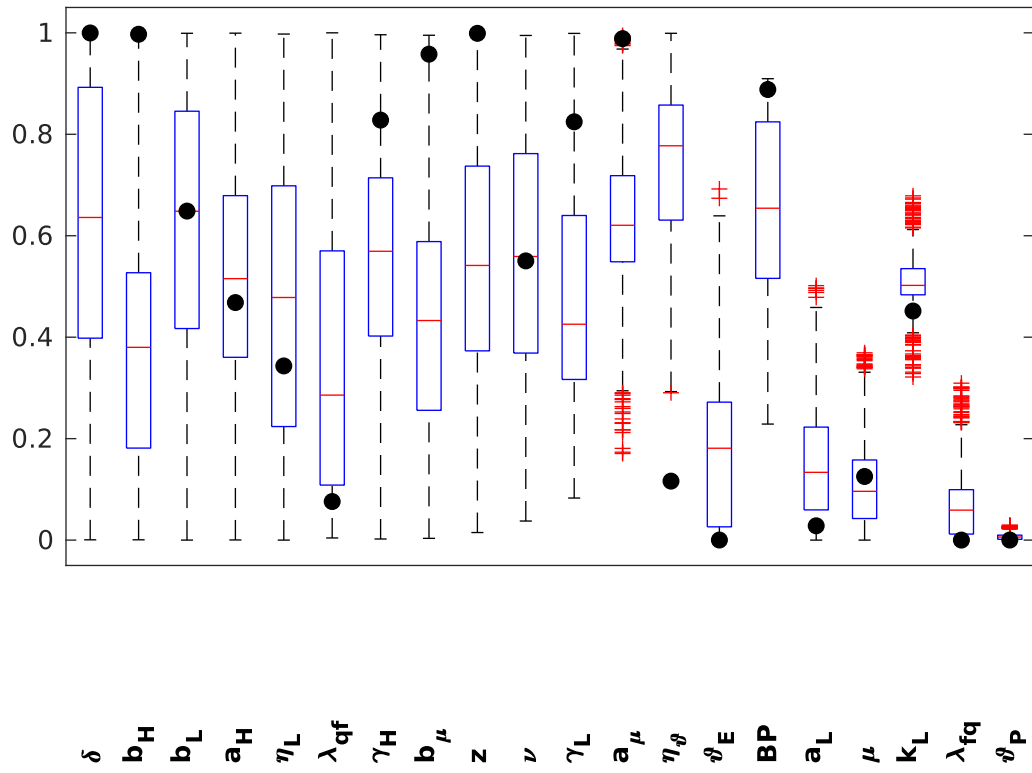
The number of estimations needed to perform the validation was1000.

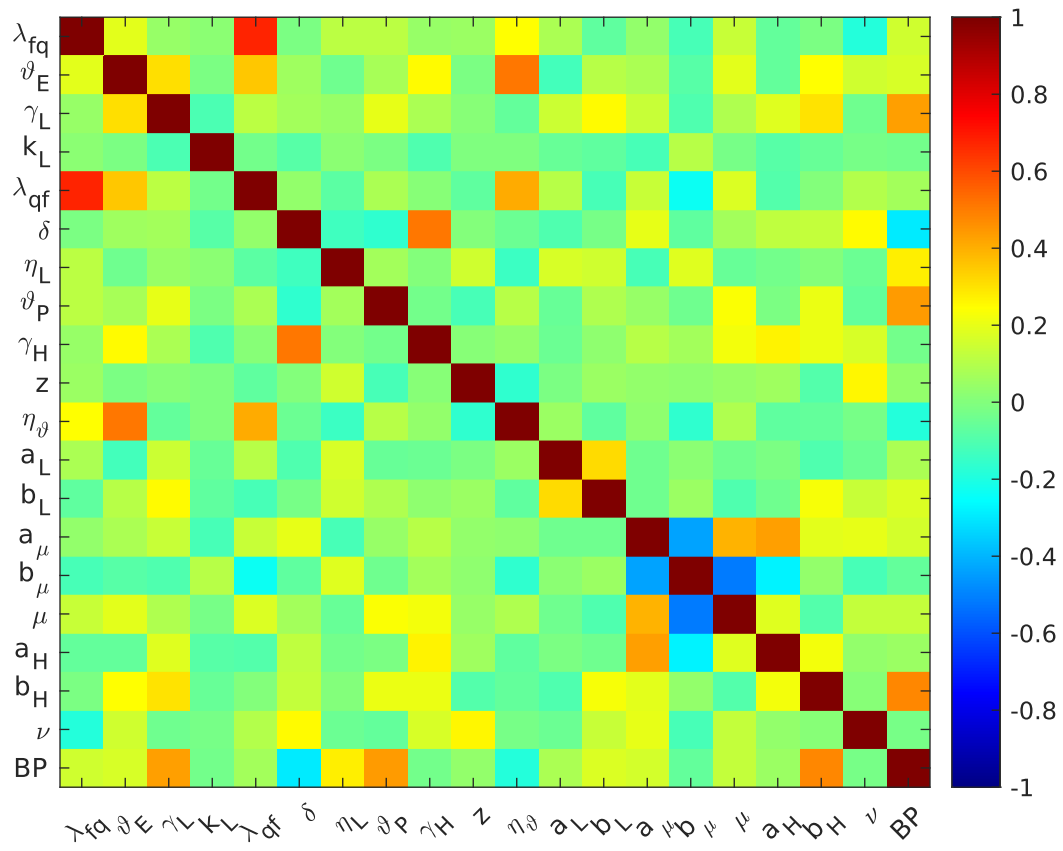
### 9.2. Estimated parameters with their intervals

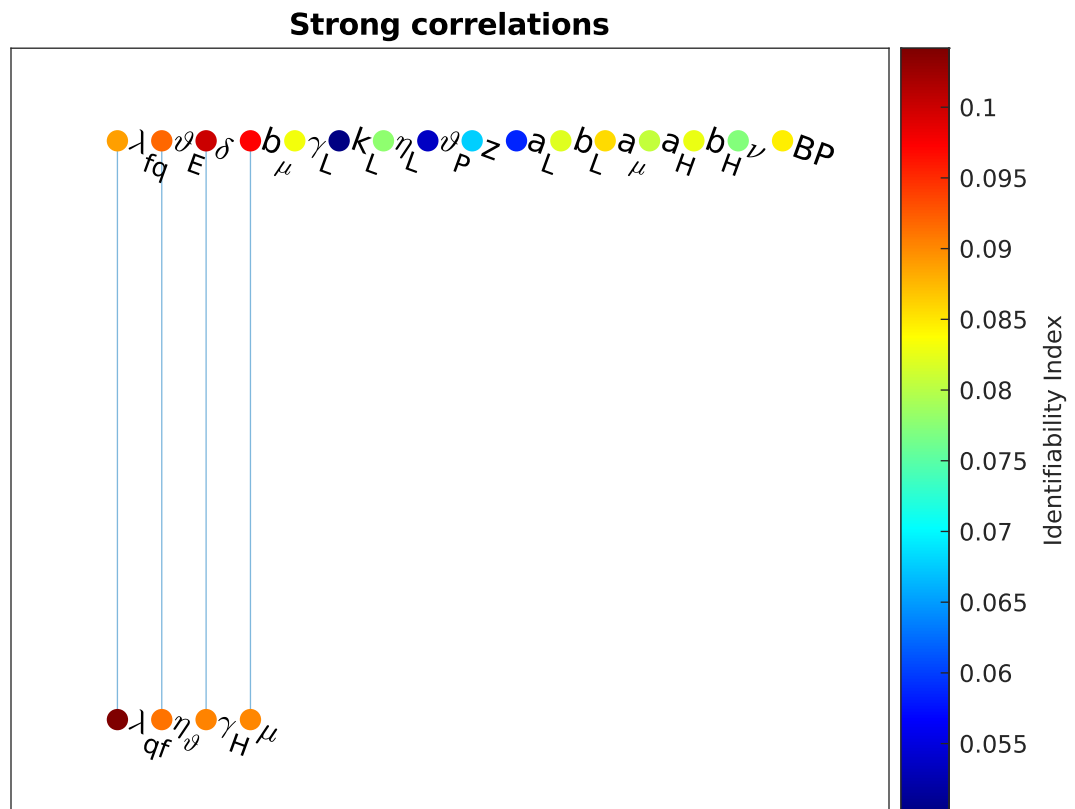
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0371'	'0.0811'	'0.0591'	'0'	'0.0888'
$\vartheta_E$	'0.1647'	'0.1975'	'0.1811'	'0.0001'	'0.0917'
$\gamma_L$	'0.4012'	'0.45'	'0.4256'	'0.8246'	'0.0831'
$k_L$	'5.3937'	'5.6447'	'5.5192'	'5.0644'	'0.0502'
$\lambda_{qf}$	'0.2551'	'0.3165'	'0.2858'	'0.076'	'0.1042'
$\delta$	'0.0905'	'0.1003'	'0.0954'	'0.15'	'0.1001'
$\eta_L$	'0.4477'	'0.5088'	'0.4783'	'0.3433'	'0.0779'
$\vartheta_P$	'0.0039'	'0.0082'	'0.006'	'0.0001'	'0.0537'
$\gamma_H$	'0.5441'	'0.5946'	'0.5694'	'0.828'	'0.0904'
$z$	'15.4123'	'17.073'	'16.2427'	'29.97'	'0.0677'
$\eta_{\vartheta}$	'0.7538'	'0.8009'	'0.7773'	'0.1163'	'0.0913'
$a_L$	'2.671'	'3.07'	'2.8705'	'1.395'	'0.0587'
$b_L$	'9.6418'	'10.5111'	'10.0764'	'10.0804'	'0.0821'
$a_{\mu}$	'9.3493'	'10.0279'	'9.6886'	'14.8387'	'0.0857'
$b_{\mu}$	'6.6908'	'7.429'	'7.0599'	'14.4112'	'0.0974'
$\mu$	'0.0798'	'0.1125'	'0.0961'	'0.1254'	'0.09'
$a_H$	'7.8322'	'8.5991'	'8.2156'	'7.5555'	'0.0807'
$b_H$	'5.9807'	'6.6592'	'6.3199'	'14.9605'	'0.0828'
$\nu$	'265.8185'	'293.2875'	'279.553'	'275.1944'	'0.0772'
BP	'398.7294'	'402.2706'	'400.5'	'422.5'	'0.0847'

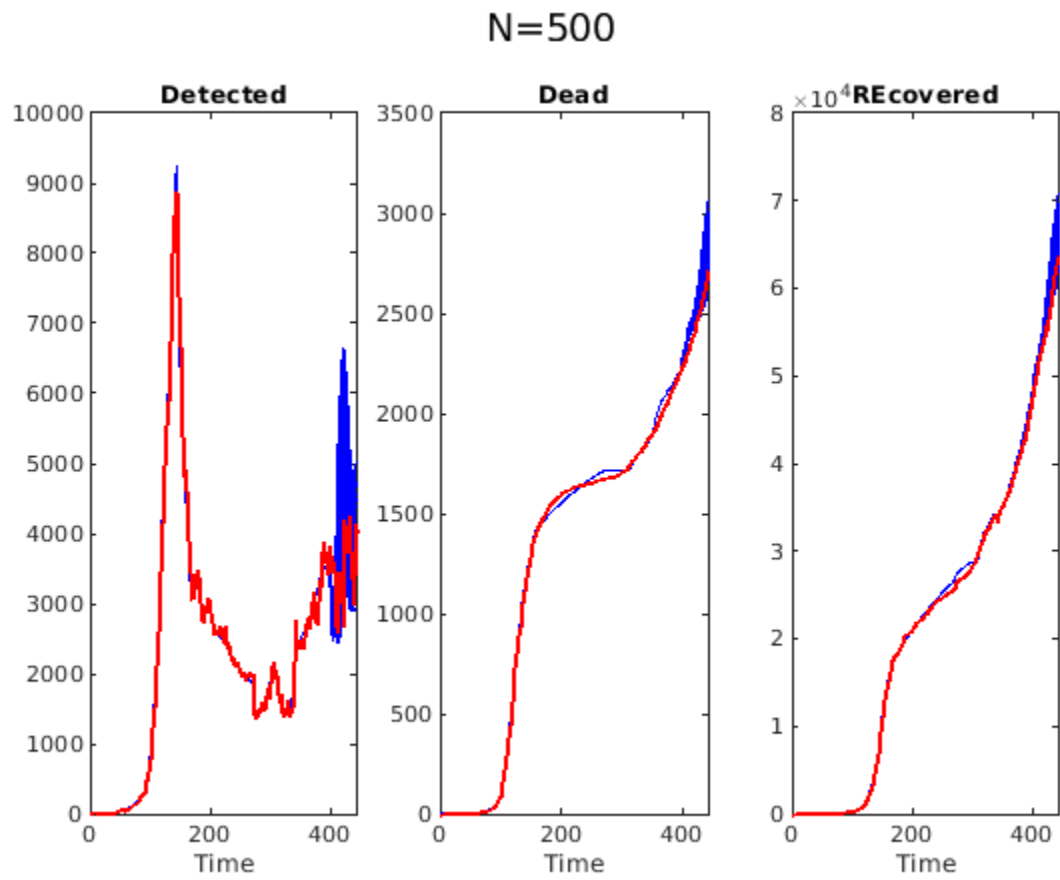
### 9.3. Identifiability analysis







## 9.4. Uncertainty analysys





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## Chapter 10. Extension number10

### 10.1. Basic information

The extension to be validated consists of the time series from the data443 to the 455. The status of the validation is: COMPLETED.

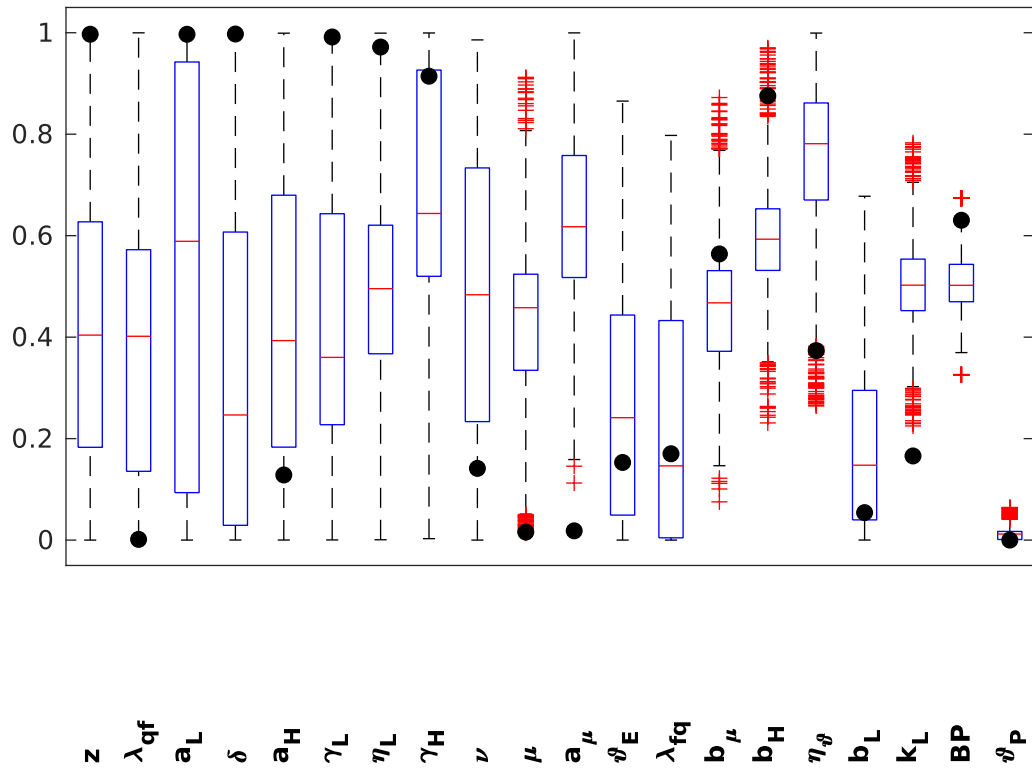
The number of estimations needed to perform the validation was1000.

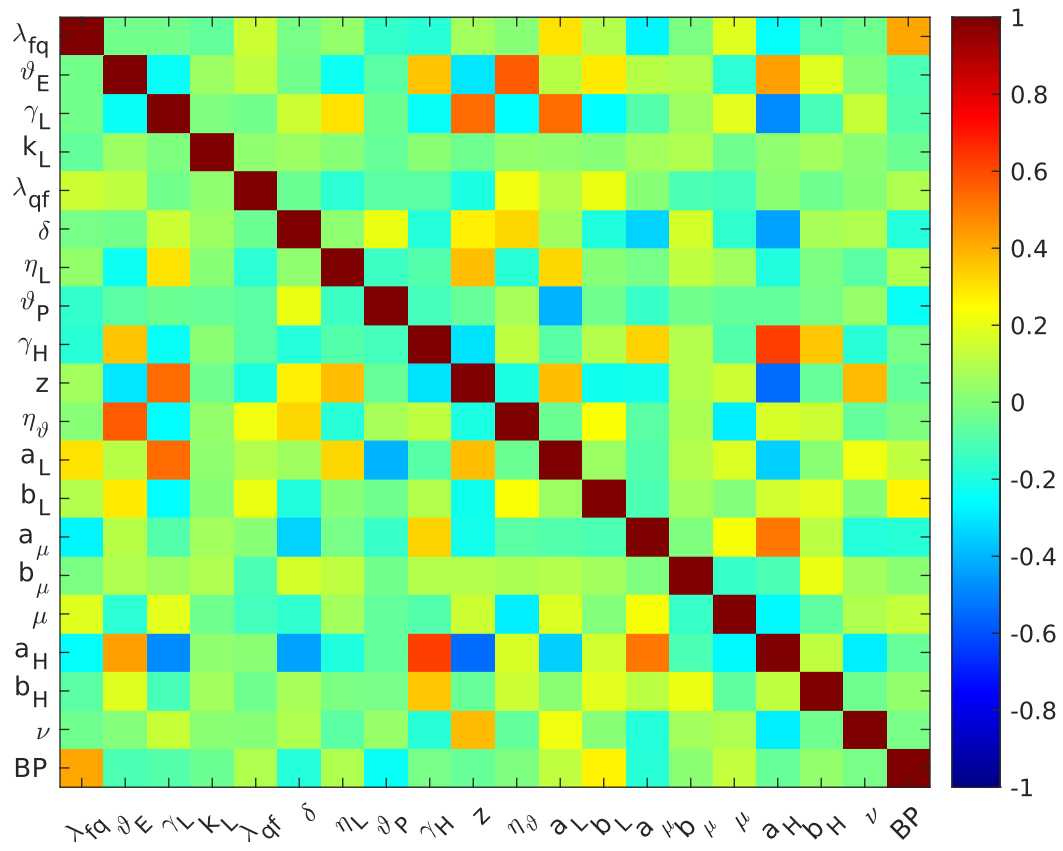
### 10.2. Estimated parameters with their intervals

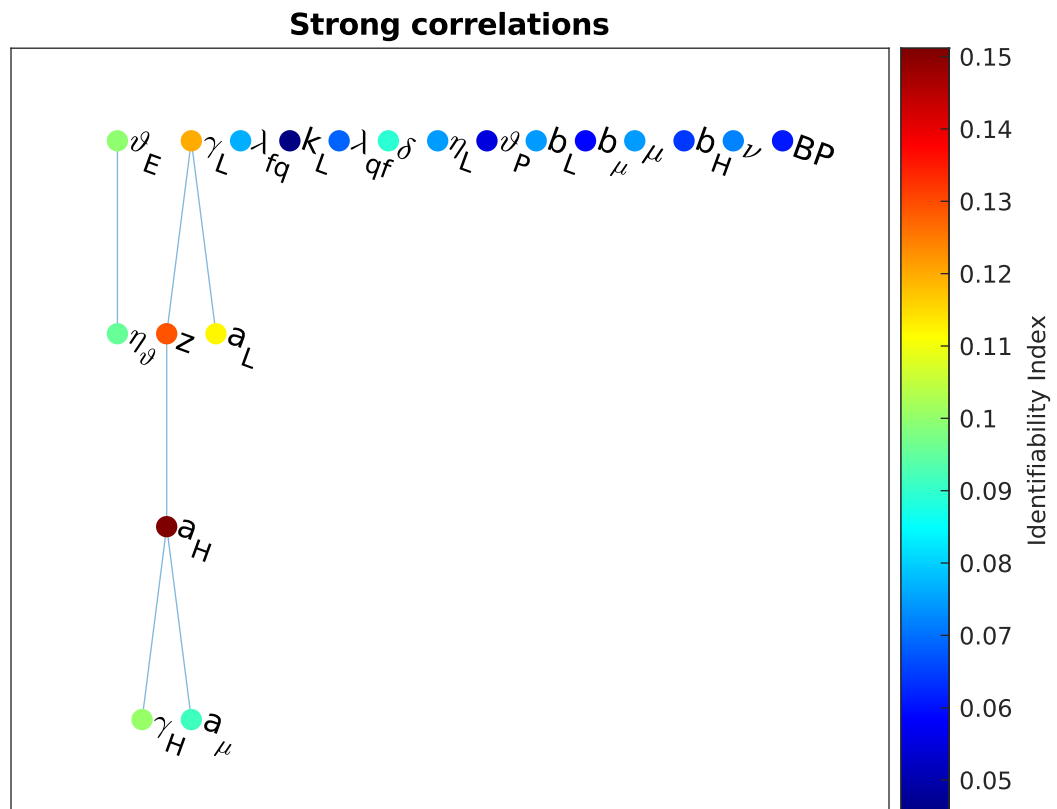
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.1248'	'0.1693'	'0.147'	'0.1702'	'0.0766'
\vartheta_E	'0.2225'	'0.26'	'0.2412'	'0.153'	'0.0997'
\gamma_L	'0.337'	'0.3832'	'0.3601'	'0.9916'	'0.1199'
k_L	'5.4201'	'5.6234'	'5.5217'	'2.4927'	'0.0456'
\lambda_{qf}	'0.3803'	'0.4232'	'0.4017'	'0.0014'	'0.0689'
\delta	'0.0329'	'0.0411'	'0.037'	'0.1496'	'0.0897'
\eta_L	'0.4765'	'0.5147'	'0.4956'	'0.9718'	'0.0747'
\vartheta_P	'0.0069'	'0.017'	'0.012'	'0'	'0.0551'
\gamma_H	'0.6252'	'0.6623'	'0.6437'	'0.9143'	'0.1005'
z	'11.4079'	'12.8326'	'12.1202'	'29.9112'	'0.129'
\eta_{\vartheta}	'0.7616'	'0.8009'	'0.7812'	'0.3734'	'0.0956'
a_L	'8.8059'	'9.6838'	'9.2449'	'14.9571'	'0.1123'
b_L	'2.8133'	'3.3208'	'3.067'	'1.7581'	'0.0746'
a_{\mu}	'9.4221'	'9.8675'	'9.6448'	'1.2557'	'0.0917'
b_{\mu}	'7.3552'	'7.7377'	'7.5465'	'8.8964'	'0.0592'
\mu	'0.4411'	'0.4751'	'0.4581'	'0.0158'	'0.0746'
a_H	'6.1472'	'6.8627'	'6.5049'	'2.7974'	'0.1512'
b_H	'9.0897'	'9.5163'	'9.303'	'13.2569'	'0.0641'
\nu	'230.1691'	'253.3848'	'241.7769'	'70.6666'	'0.0724'
BP	'433.3444'	'433.7547'	'433.5495'	'436.5'	'0.0611'

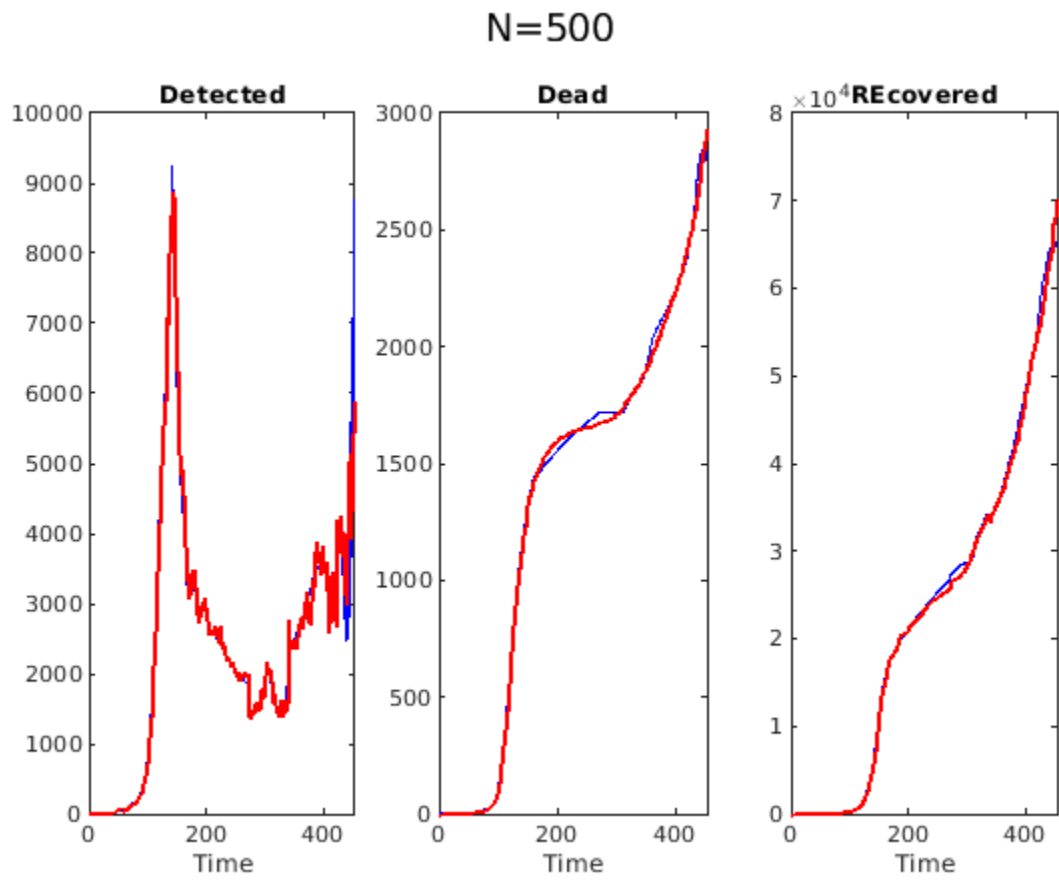
## 10.3. Identifiability analysis







## 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 data455 to the 464. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

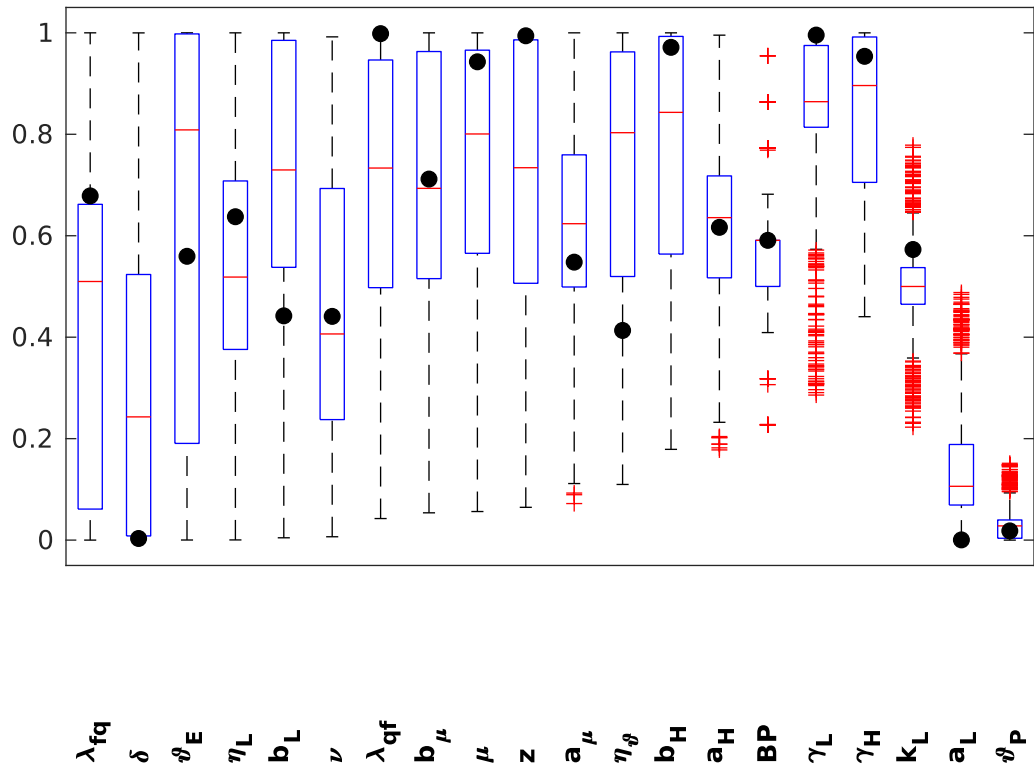
### 11.2. Estimated parameters with their intervals

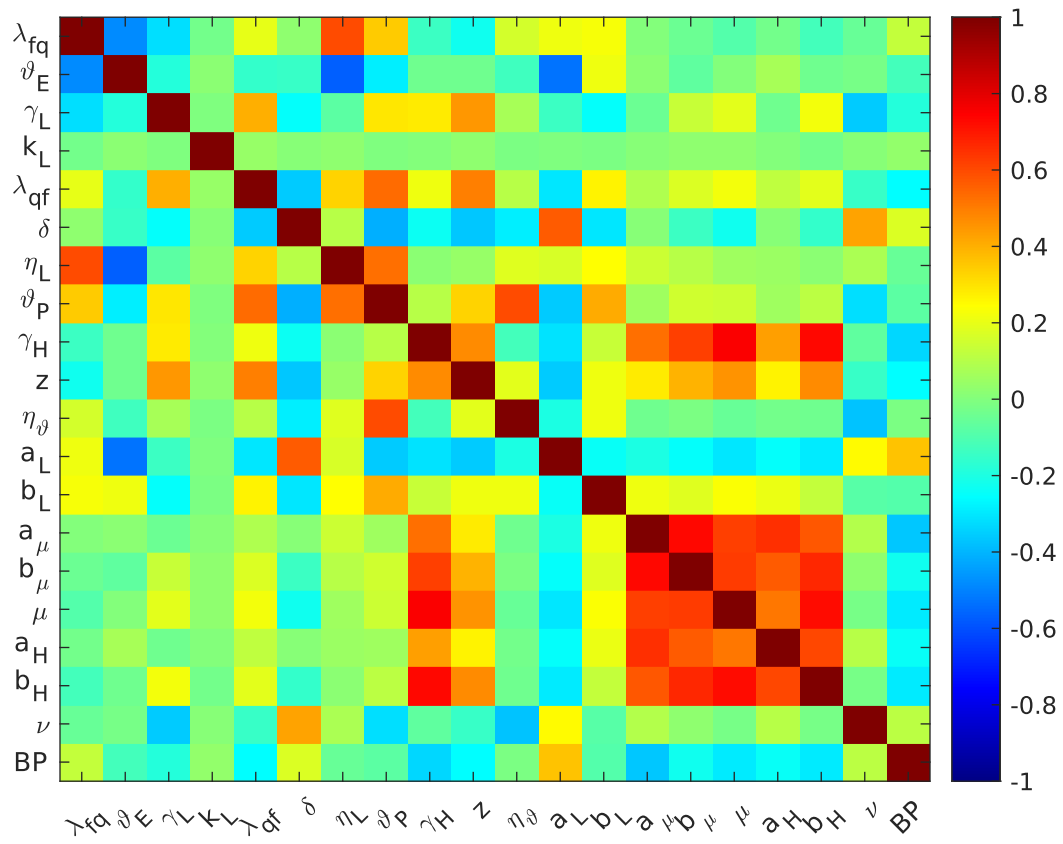
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

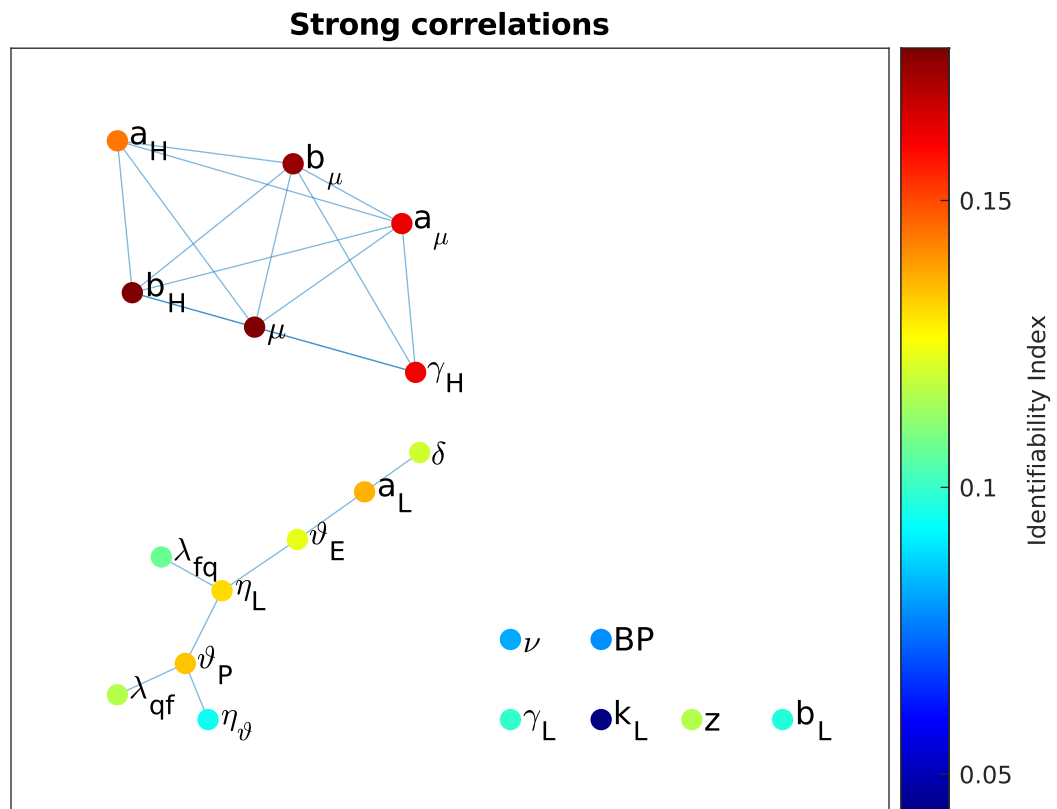
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.4219'	'0.9242'	'0.5098'	'0.6785'	'0.1071'
$\vartheta_E$	'0.5302'	'0.8191'	'0.8086'	'0.5595'	'0.1233'
$\gamma_L$	'0.5621'	'1'	'0.8643'	'0.9956'	'0.0999'
$k_L$	'1'	'10'	'5.4998'	'6.1558'	'0.0434'
$\lambda_{qf}$	'0.9195'	'1'	'0.7335'	'0.9984'	'0.1163'
$\delta$	'0'	'0.0011'	'0.0364'	'0.0005'	'0.12'
$\eta_L$	'0.1789'	'1'	'0.5185'	'0.6375'	'0.1312'
$\vartheta_P$	'0.0018'	'0.0409'	'0.028'	'0.0182'	'0.1341'
$\gamma_H$	'0'	'0.96'	'0.8961'	'0.9537'	'0.1614'
$z$	'18.6948'	'30'	'22.0227'	'29.8253'	'0.1167'
$\eta_{\vartheta}$	'0.2003'	'0.6695'	'0.8031'	'0.4133'	'0.0945'
$a_L$	'1'	'2.4979'	'2.4848'	'1.0058'	'0.1365'
$b_L$	'2.5593'	'10.1376'	'11.2158'	'7.1892'	'0.098'
$a_{\mu}$	'2.0159'	'14.335'	'9.732'	'8.671'	'0.1621'
$b_{\mu}$	'1'	'13.096'	'10.7075'	'10.9639'	'0.1729'
$\mu$	'0.0192'	'0.96'	'0.8006'	'0.9429'	'0.1765'
$a_H$	'1.5544'	'14.4622'	'9.8995'	'9.6318'	'0.1441'
$b_H$	'3.0221'	'15'	'12.8048'	'14.5995'	'0.1765'
$\nu$	'148.3556'	'228.9805'	'203.1911'	'220.5126'	'0.0823'
BP	'446.8222'	'449.7095'	'449.5'	'449.5'	'0.0785'

### 11.3. Identifiability analysis

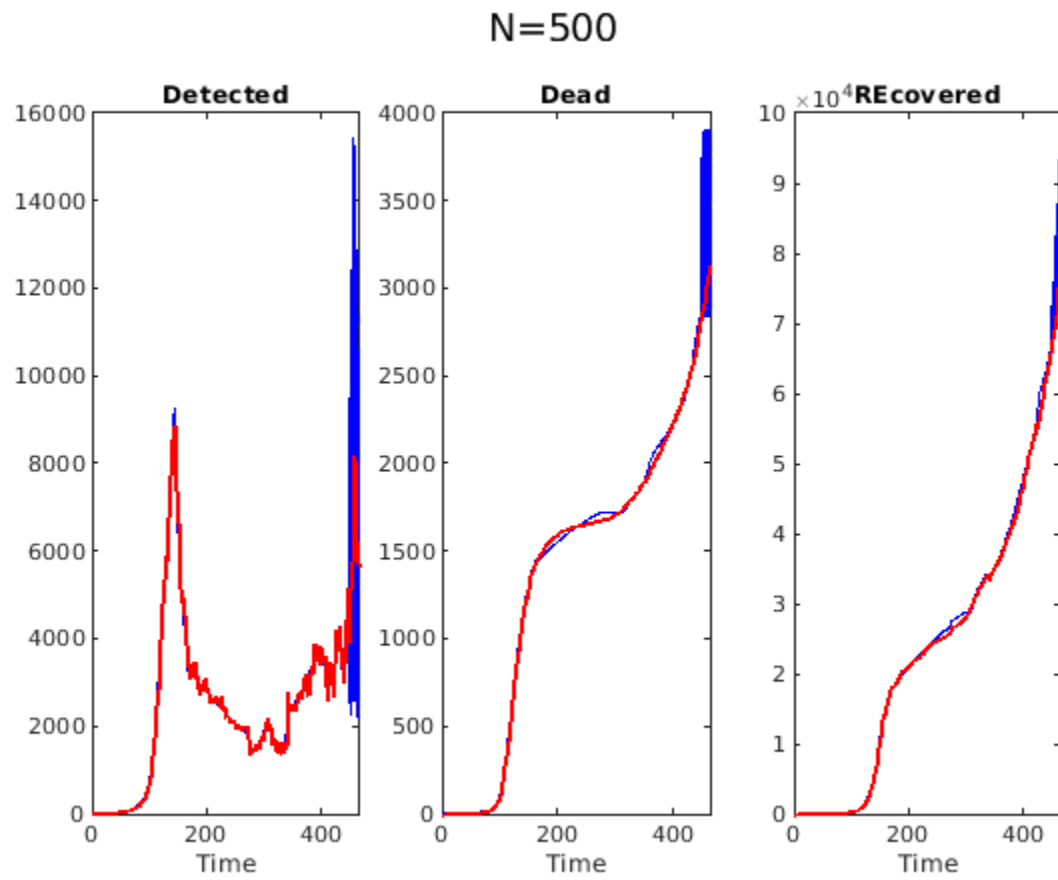








## 11.4. Uncertainty analysis



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## Chapter 12. Extension number12

### 12.1. Basic information

The extension to be validated consists of the time series from the data464 to the 471. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

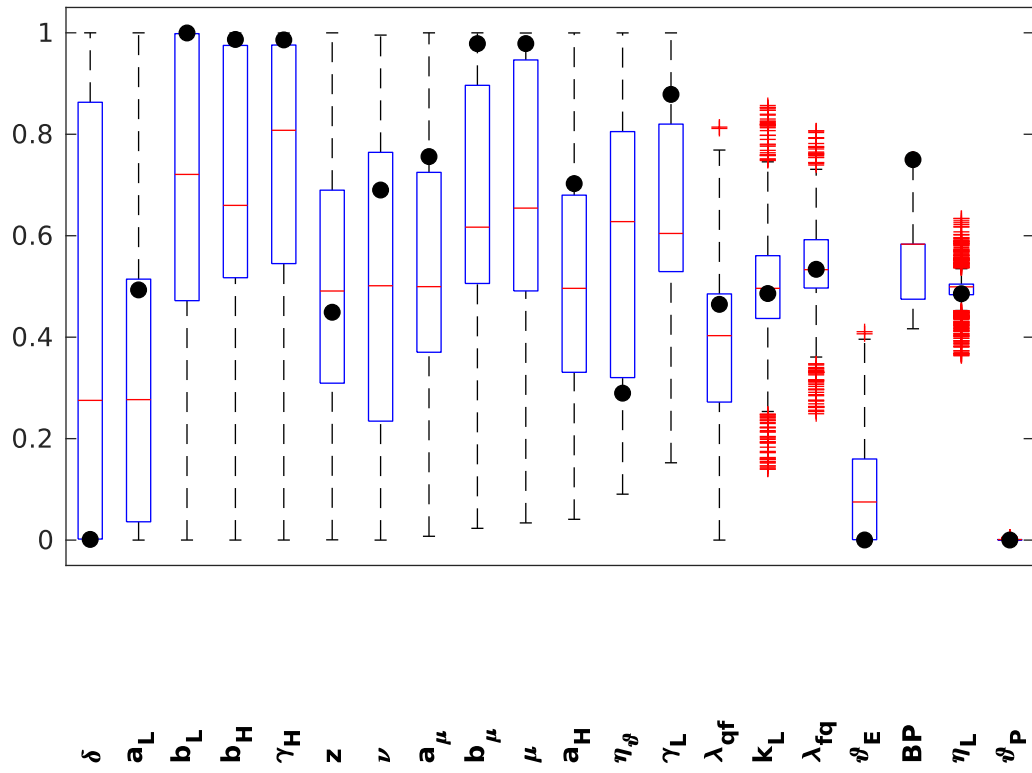
### 12.2. Estimated parameters with their intervals

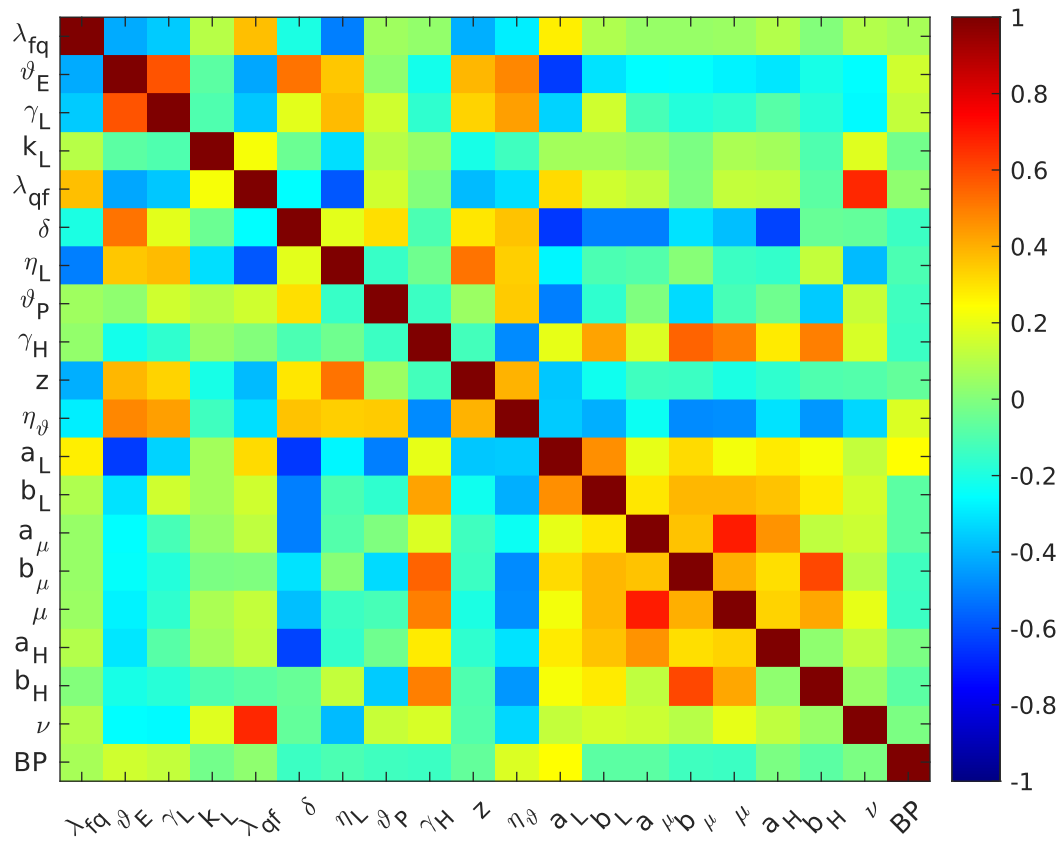
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

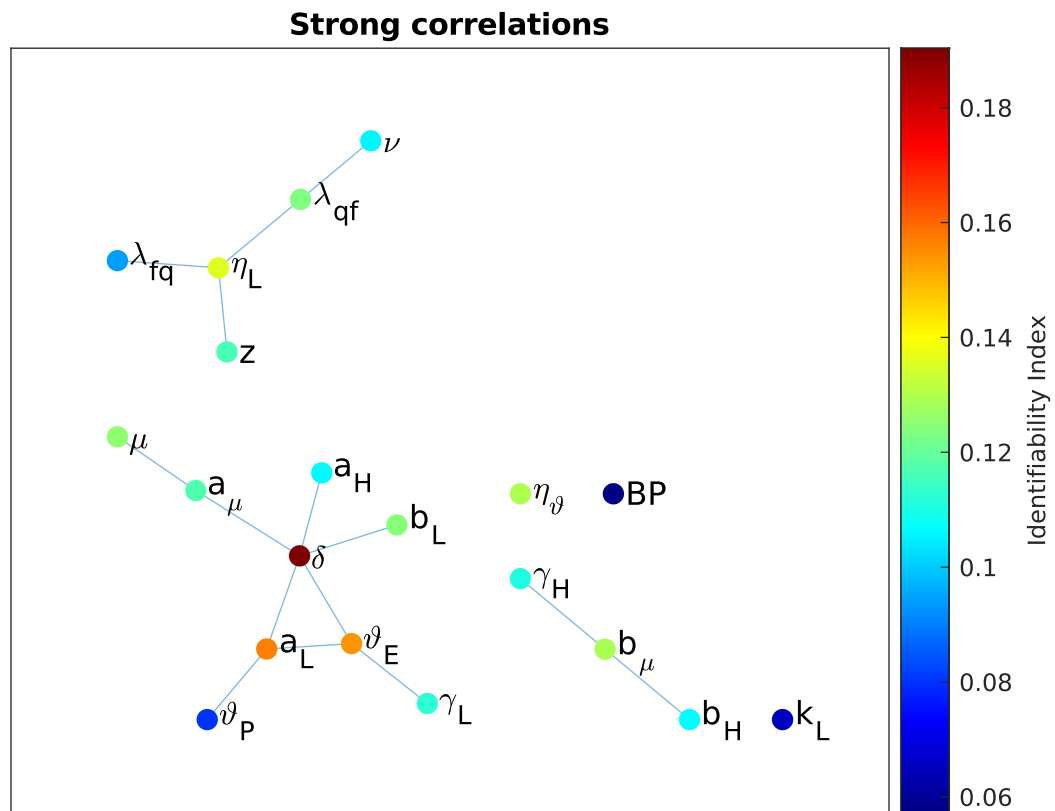
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0494'	'1'	'0.5331'	'0.5338'	'0.0946'
$\vartheta_E$	'0'	'0.0005'	'0.0756'	'0.0002'	'0.1543'
$\gamma_L$	'0.5582'	'0.9417'	'0.6039'	'0.8786'	'0.1125'
$k_L$	'1'	'9.1'	'5.4666'	'5.3745'	'0.0652'
$\lambda_{qf}$	'0'	'1'	'0.4031'	'0.4647'	'0.1237'
$\delta$	'0'	'0.0005'	'0.0413'	'0.0002'	'0.1904'
$\eta_L$	'0'	'1'	'0.4992'	'0.4856'	'0.1359'
$\vartheta_P$	'0'	'0.0017'	'0.001'	'0.0002'	'0.0805'
$\gamma_H$	'0'	'1'	'0.8078'	'0.986'	'0.111'
$z$	'0'	'30'	'14.7307'	'13.4745'	'0.1165'
$\eta_{\vartheta}$	'0.2856'	'0.3894'	'0.6278'	'0.2896'	'0.1296'
$a_L$	'6.6246'	'8.053'	'4.8768'	'7.9046'	'0.1571'
$b_L$	'9.7434'	'15'	'11.0919'	'14.9953'	'0.1244'
$a_{\mu}$	'1'	'15'	'7.9945'	'11.5838'	'0.1174'
$b_{\mu}$	'1'	'15'	'9.6361'	'14.7007'	'0.1295'
$\mu$	'0'	'1'	'0.6544'	'0.9788'	'0.1254'
$a_H$	'1'	'15'	'7.9477'	'10.8378'	'0.1064'
$b_H$	'1'	'15'	'10.2374'	'14.8164'	'0.1067'
$\nu$	'80.7874'	'500'	'250.689'	'345.0368'	'0.106'
BP	'457.7681'	'460.6768'	'458.5'	'459.5'	'0.0573'

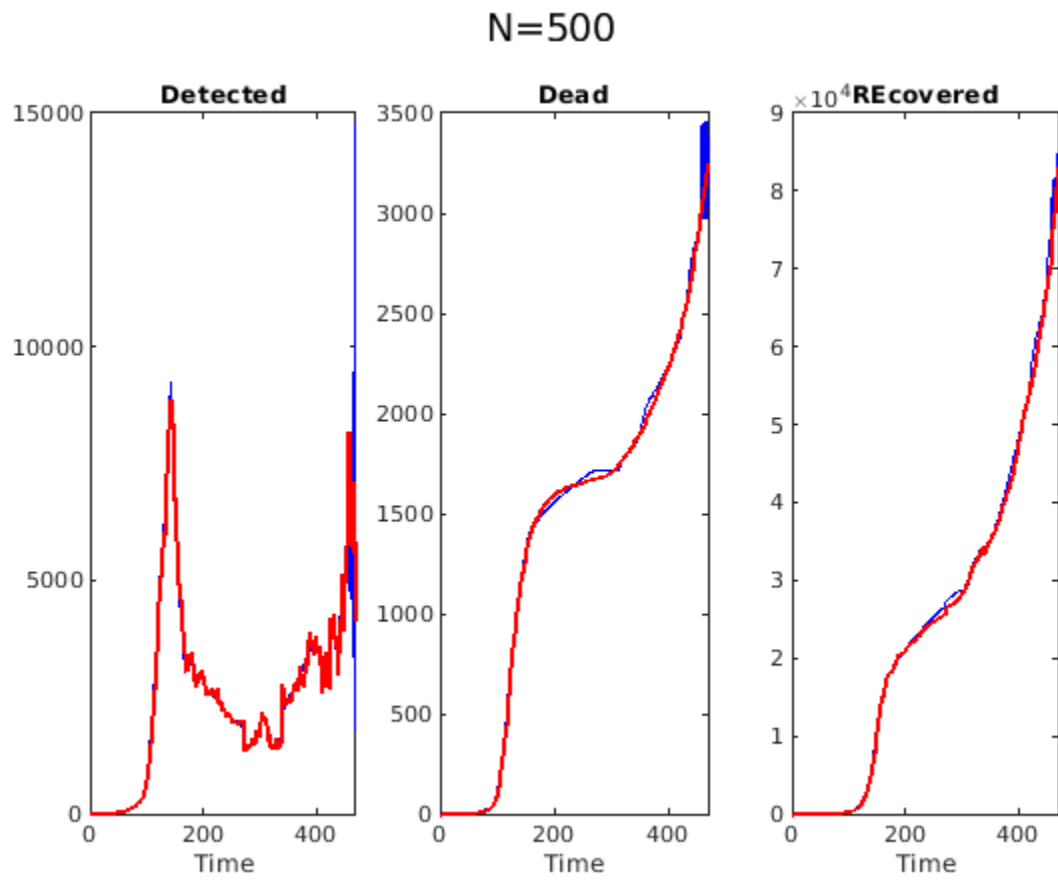
### 12.3. Identifiability analysis







## 12.4. Uncertainty analysis



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## Chapter 13. Extension number13

### 13.1. Basic information

The extension to be validated consists of the time series from the data471 to the 500. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

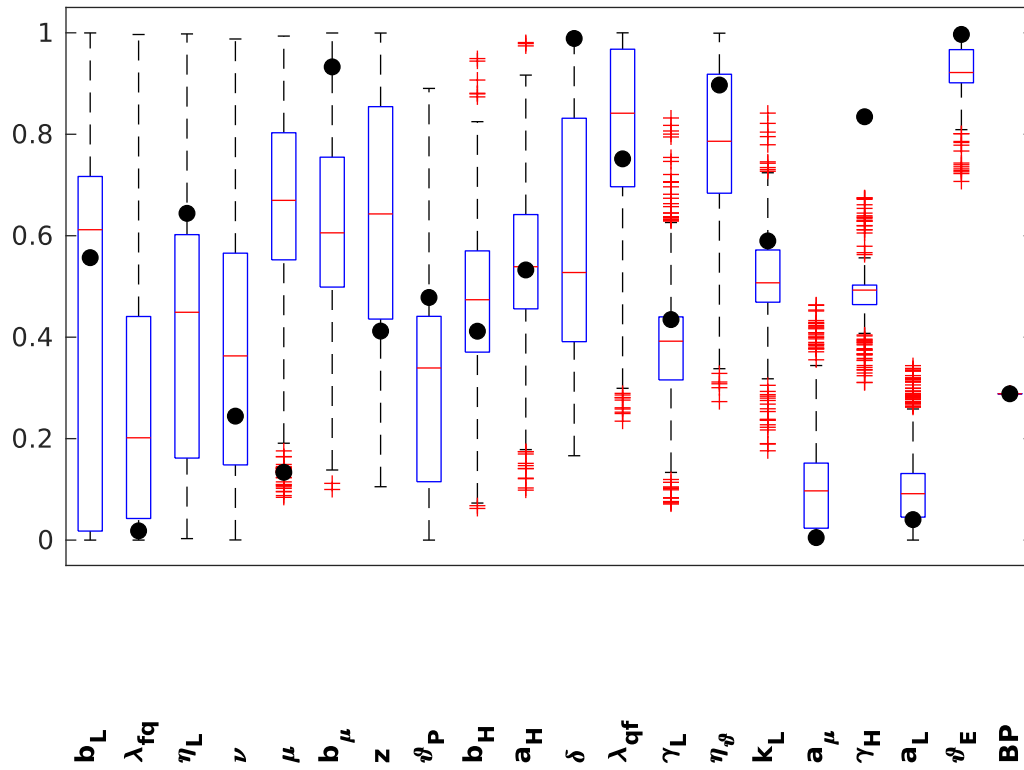
### 13.2. Estimated parameters with their intervals

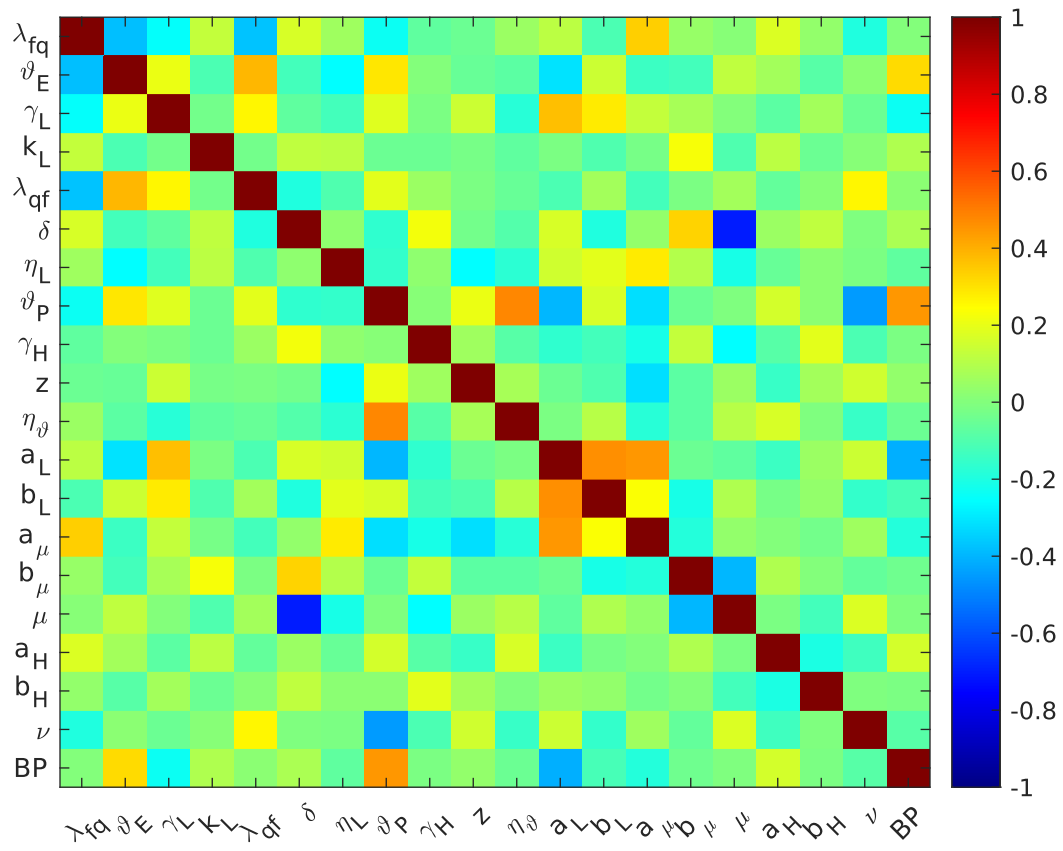
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

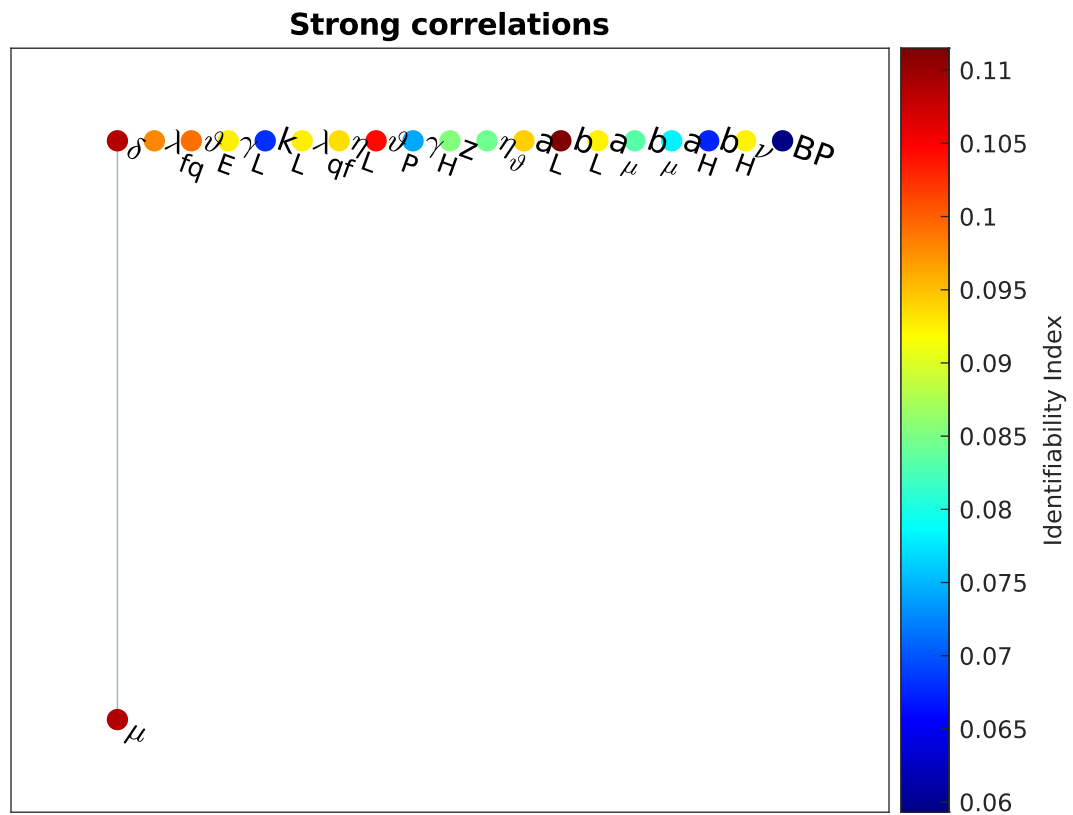
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1633'	'0.24'	'0.2017'	'0.0182'	'0.0979'
$\vartheta_E$	'0.8874'	'0.956'	'0.9217'	'0.9968'	'0.0992'
$\gamma_L$	'0.3588'	'0.4254'	'0.3921'	'0.4347'	'0.0925'
$k_L$	'5.3345'	'5.7948'	'5.5647'	'6.3079'	'0.0682'
$\lambda_{qf}$	'0.8034'	'0.8796'	'0.8415'	'0.7515'	'0.0927'
$\delta$	'0.0738'	'0.0844'	'0.0791'	'0.1483'	'0.1088'
$\eta_L$	'0.4101'	'0.4882'	'0.4491'	'0.6441'	'0.0935'
$\vartheta_P$	'0.3092'	'0.3693'	'0.3393'	'0.4783'	'0.1044'
$\gamma_H$	'0.4665'	'0.5191'	'0.4928'	'0.8345'	'0.0743'
$z$	'18.168'	'20.4101'	'19.289'	'12.3615'	'0.0856'
$\eta_{\vartheta}$	'0.7534'	'0.819'	'0.7862'	'0.897'	'0.0846'
$a_L$	'1.943'	'2.6179'	'2.2805'	'1.5655'	'0.0943'
$b_L$	'8.8656'	'10.2662'	'9.5659'	'8.7947'	'0.1115'
$a_{\mu}$	'1.9816'	'2.7359'	'2.3587'	'1.0691'	'0.0925'
$b_{\mu}$	'9.0536'	'9.9058'	'9.4797'	'14.0596'	'0.0832'
$\mu$	'0.6299'	'0.7096'	'0.6697'	'0.1336'	'0.1088'
$a_H$	'8.1303'	'8.9584'	'8.5444'	'8.4554'	'0.0782'
$b_H$	'7.2312'	'8.0358'	'7.6335'	'6.7646'	'0.0676'
$\nu$	'161.5049'	'201.6031'	'181.554'	'122.1839'	'0.0924'
BP	'471.3664'	'471.6335'	'471.5'	'471.5'	'0.0593'



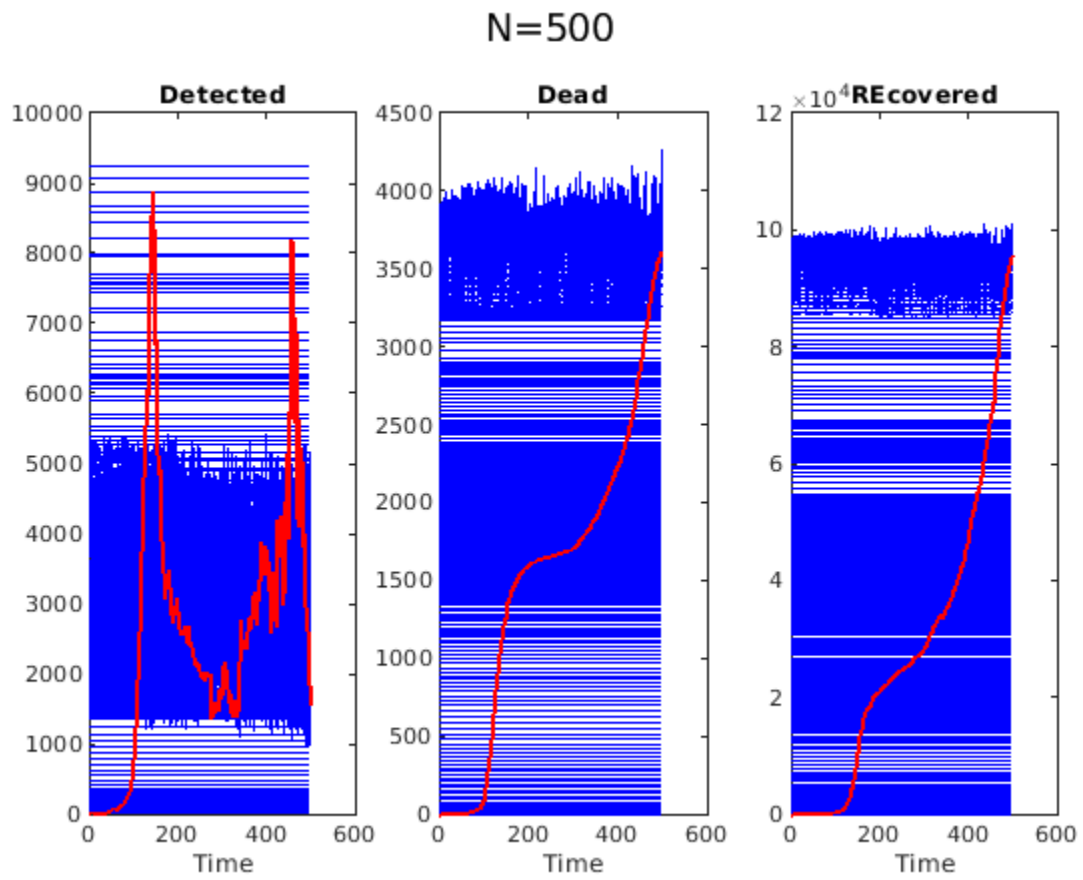
### 13.3. Identifiability analysis







## 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 data500 to the 706. The status of the validation is: COMPLETED.

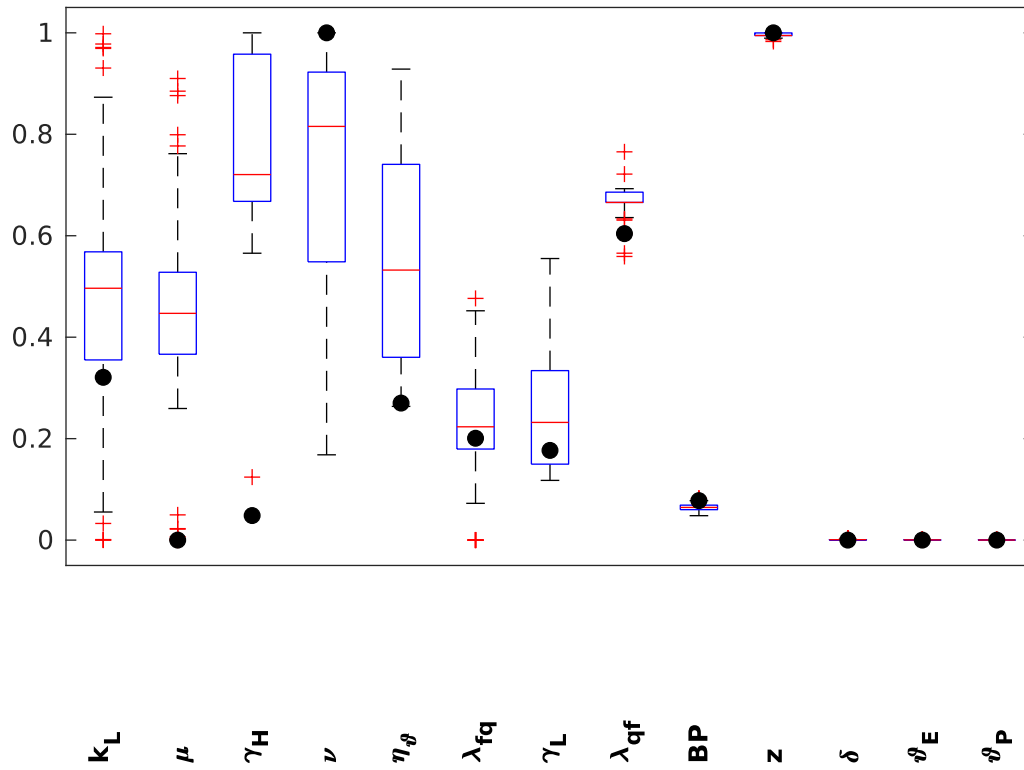
The number of estimations needed to perform the validation was26000.

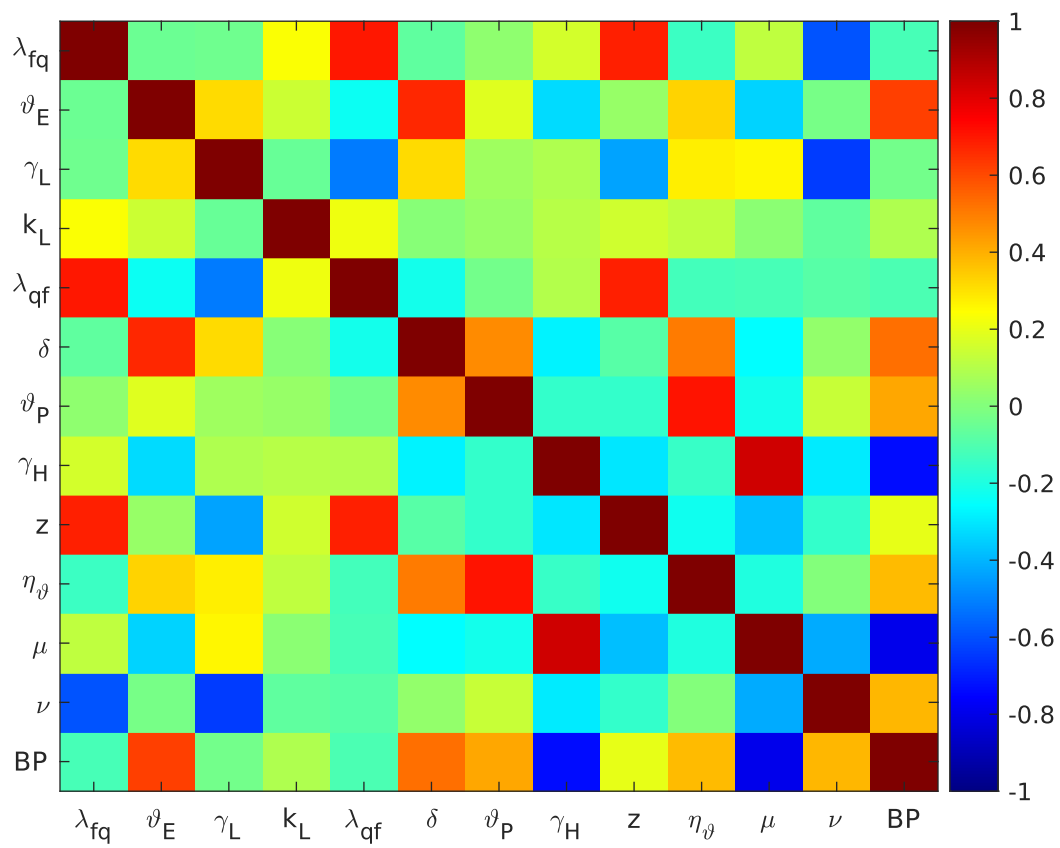
### 14.2. Estimated parameters with their intervals

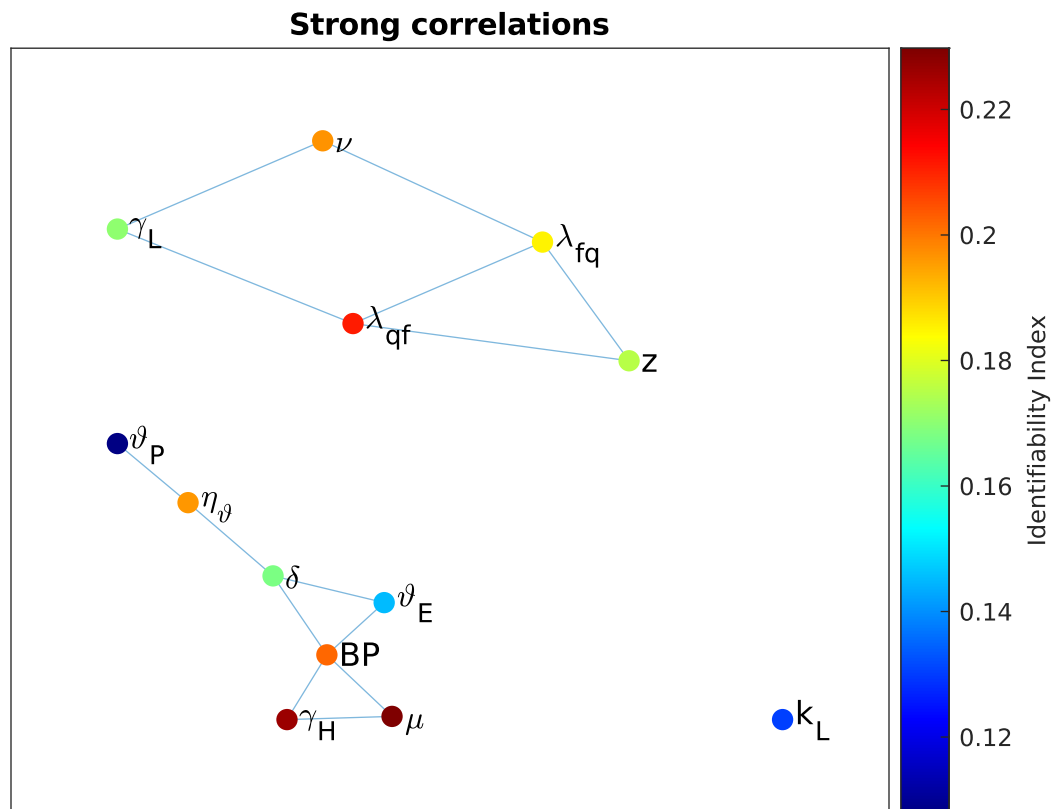
It was necessary to fix 7 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.1898'	'0.2569'	'0.2234'	'0.2008'	'0.1855'
\vartheta_E	'0'	'0.0109'	'0.0004'	'0'	'0.1451'
\gamma_L	'0.1968'	'0.2672'	'0.232'	'0.1768'	'0.1704'
k_L	'4.8582'	'6.0785'	'5.4683'	'3.888'	'0.1305'
\lambda_{qf}	'0.6106'	'0.7207'	'0.6657'	'0.6041'	'0.2108'
\delta	'0'	'0.0018'	'0.0001'	'0'	'0.168'
\eta_L	'0.0368'	'0.0368'	'0.0368'	'0.0368'	'0'
\vartheta_P	'0'	'0.0008'	'0.0002'	'0'	'0.108'
\gamma_H	'0.639'	'0.8022'	'0.7206'	'0.0484'	'0.226'
z	'28.1108'	'30'	'29.8404'	'29.9998'	'0.1753'
\eta_{\vartheta}	'0.4732'	'0.5914'	'0.5323'	'0.2701'	'0.1964'
a_L	'12.1673'	'12.1673'	'12.1673'	'12.1673'	'0'
b_L	'1.8196'	'1.8196'	'1.8196'	'1.8196'	'0'
a_{\mu}	'4.7691'	'4.7691'	'4.7691'	'4.7691'	'0'
b_{\mu}	'6.3858'	'6.3858'	'6.3858'	'6.3858'	'0'
\mu	'0.3699'	'0.524'	'0.447'	'0'	'0.2298'
a_H	'6.4545'	'6.4545'	'6.4545'	'6.4545'	'0'
b_H	'9.8182'	'9.8182'	'9.8182'	'9.8182'	'0'
\nu	'374.9387'	'440.5818'	'407.7603'	'499.9992'	'0.1969'
BP	'484.9453'	'486.0547'	'485.5'	'488.4999'	'0.2021'

### 14.3. Identifiability analysis

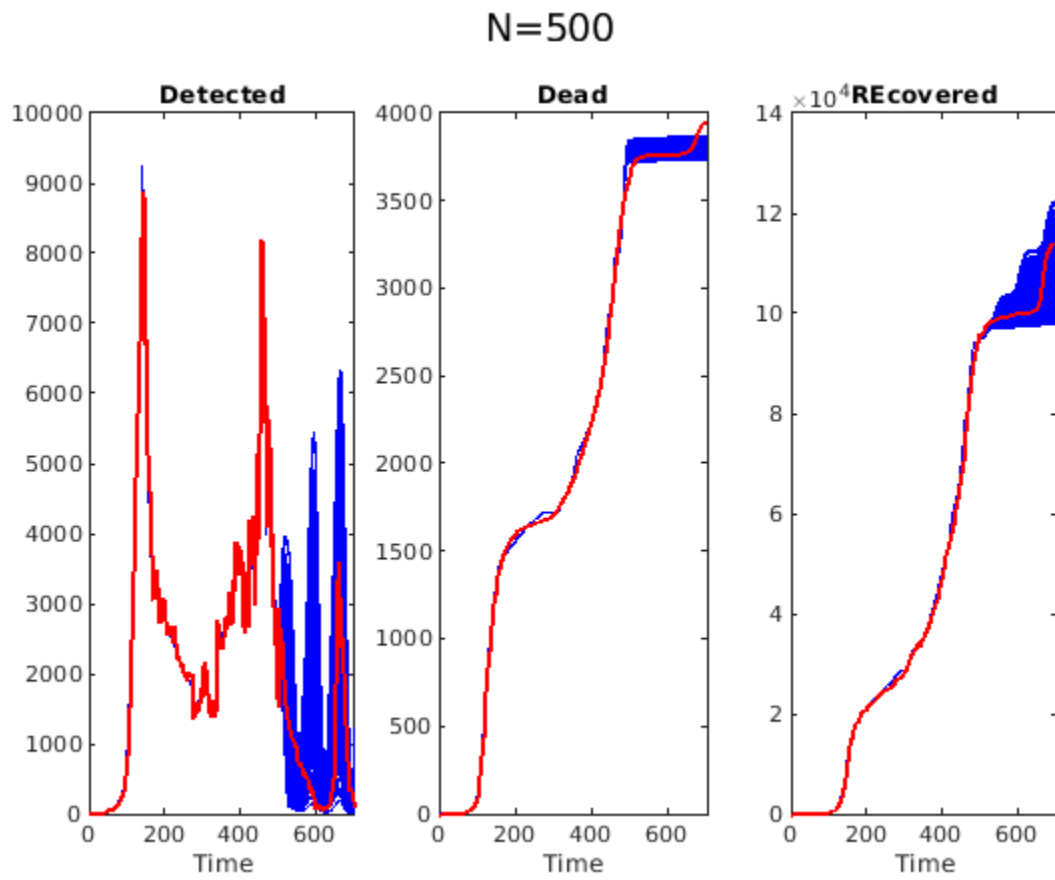








## 14.4. Uncertainty analysis



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## Chapter 15. Extension number15

### 15.1. Basic information

The extension to be validated consists of the time series from the data706 to the 720. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was2000.

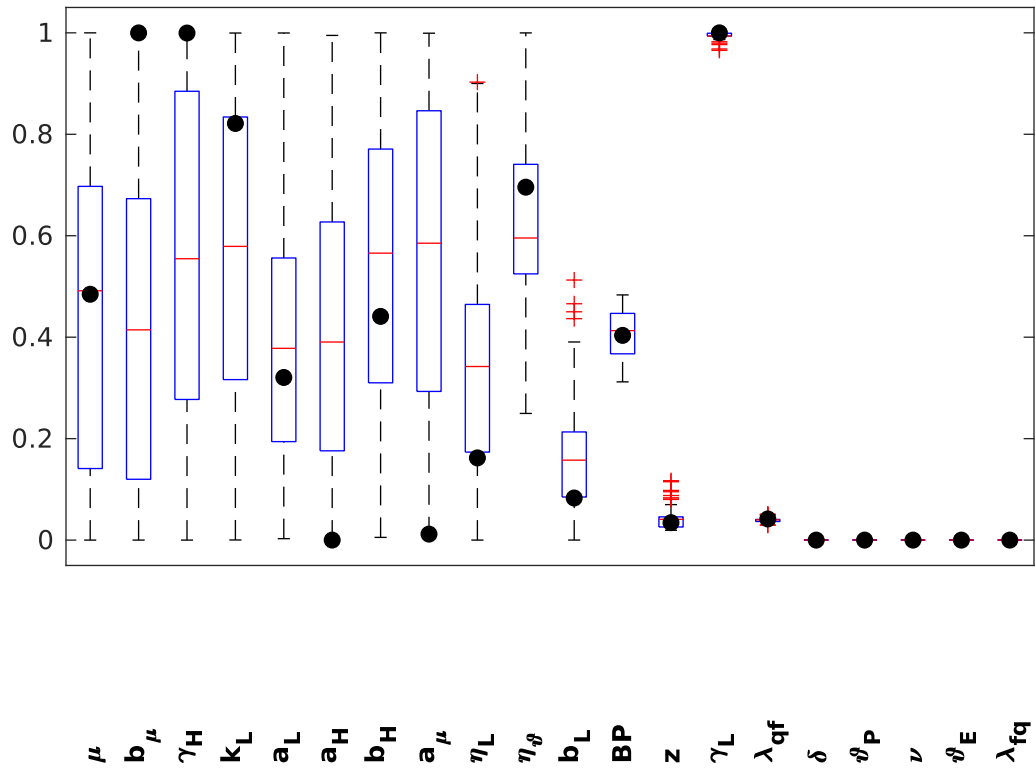
### 15.2. Estimated parameters with their intervals

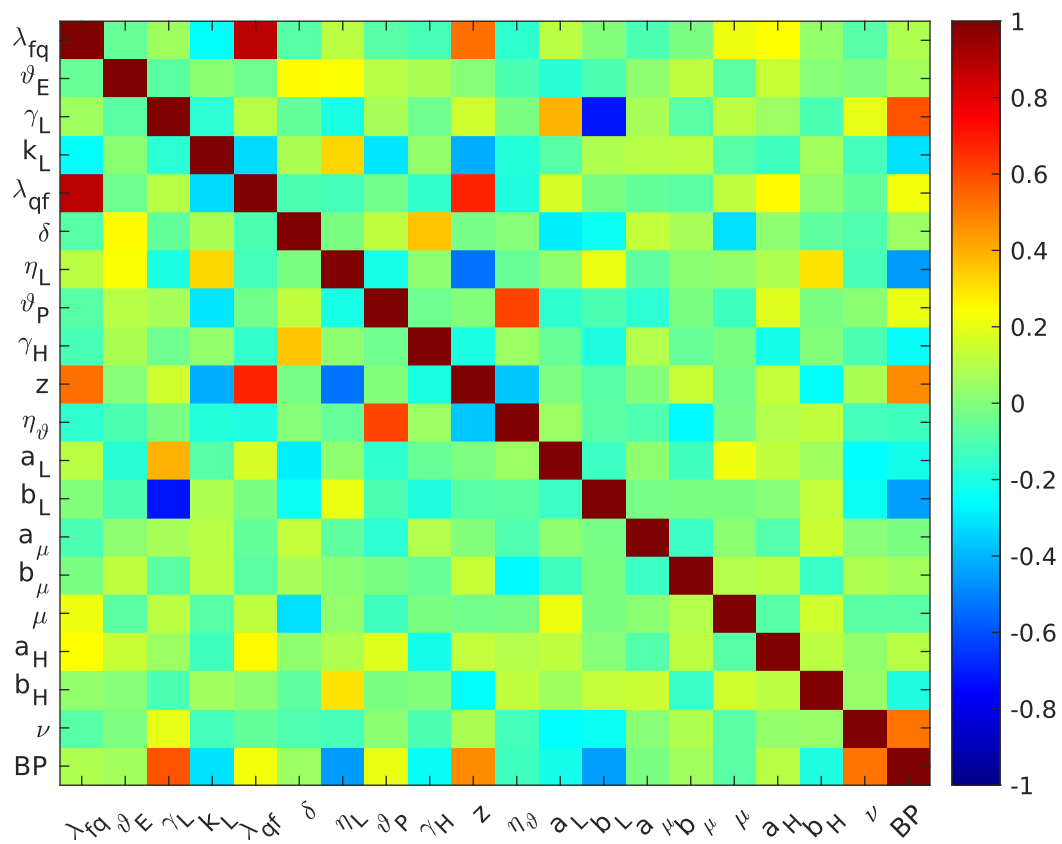
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

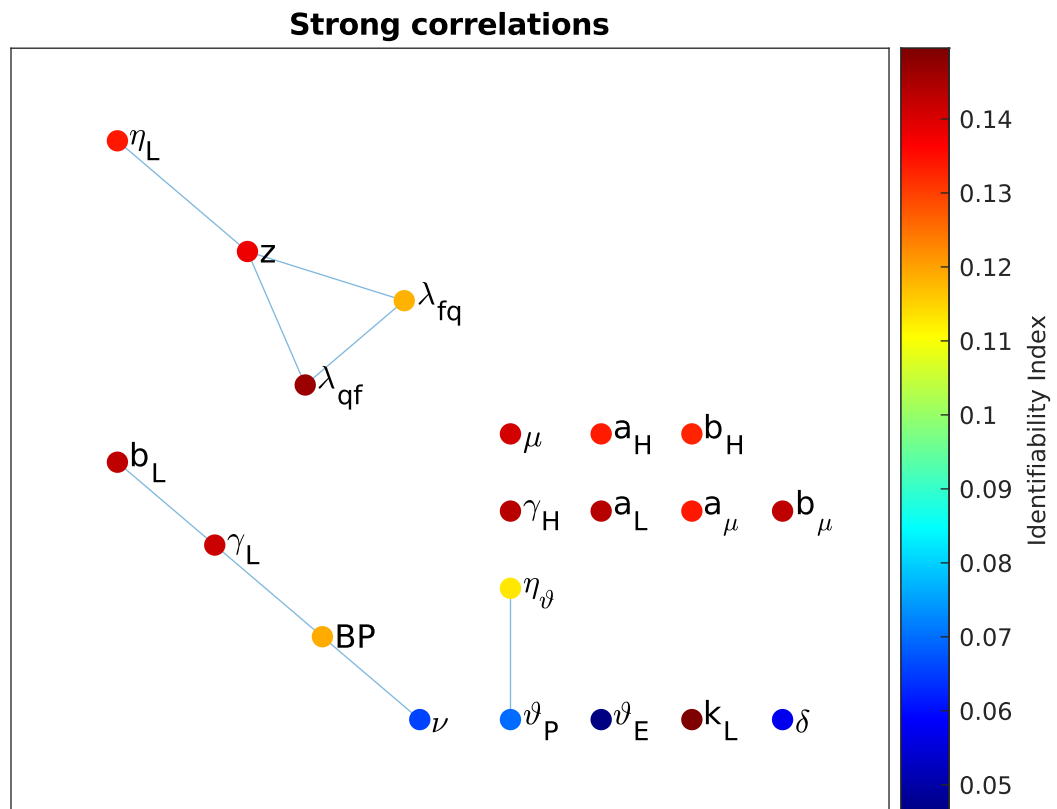
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0'	'0'	'0'	'0.1184'
$\vartheta_E$	'0'	'0'	'0'	'0'	'0.0463'
$\gamma_L$	'0.9205'	'1'	'0.9936'	'1'	'0.1418'
$k_L$	'5.2797'	'8.4266'	'6.211'	'8.3919'	'0.1496'
$\lambda_{qf}$	'0.0408'	'0.0615'	'0.0399'	'0.0417'	'0.1467'
$\delta$	'0'	'0.0013'	'0'	'0'	'0.0574'
$\eta_L$	'0.158'	'0.3695'	'0.3422'	'0.1621'	'0.1339'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0698'
$\gamma_H$	'0.779'	'1'	'0.5547'	'0.9996'	'0.1438'
$z$	'1.0189'	'1.0752'	'1.2298'	'1.0298'	'0.1379'
$\eta_{\vartheta}$	'0.6924'	'0.7133'	'0.5955'	'0.6957'	'0.1131'
$a_L$	'4.3161'	'5.6278'	'6.2922'	'5.4888'	'0.1439'
$b_L$	'2.097'	'2.7835'	'3.243'	'2.1617'	'0.143'
$a_{\mu}$	'1'	'3.4478'	'9.1941'	'1.1654'	'0.1342'
$b_{\mu}$	'13.0821'	'15'	'6.8026'	'14.9979'	'0.1428'
$\mu$	'0.2893'	'0.5066'	'0.4915'	'0.4846'	'0.1409'
$a_H$	'1'	'5.4279'	'6.4667'	'1.0006'	'0.1335'
$b_H$	'6.6023'	'10.0914'	'8.9195'	'7.1745'	'0.1328'
$\nu$	'0'	'0'	'0.0005'	'0'	'0.0658'
BP	'582.5'	'710'	'586.7107'	'584.7527'	'0.1191'

### 15.3. Identifiability analysis







## 15.4. Uncertainty analysis

