

# **Validation process forPASTO**

**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 analysis</a>	2
<a href="#">1.4. Uncertainty analysis</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 analysis</a>	7
<a href="#">2.4. Uncertainty analysis</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 analysis</a>	12
<a href="#">3.4. Uncertainty analysis</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 analysis</a>	17
<a href="#">4.4. Uncertainty analysis</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 analysis</a>	22
<a href="#">5.4. Uncertainty analysis</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 analysis</a>	27
<a href="#">6.4. Uncertainty analysis</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 analysis</a>	32
<a href="#">7.4. Uncertainty analysis</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 analysis</a>	37
<a href="#">8.4. Uncertainty analysis</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

9.3. Identifiability analysis	42
9.4. Uncertainty analysis	45
Chapter 10. Extension number10	46
10.1. Basic information	46
10.2. Estimated parameters with their intervals	46
10.3. Identifiability analysis	47
10.4. Uncertainty analysis	50
Chapter 11. Extension number11	51
11.1. Basic information	51
11.2. Estimated parameters with their intervals	51
11.3. Identifiability analysis	52
11.4. Uncertainty analysis	55
Chapter 12. Extension number12	56
12.1. Basic information	56
12.2. Estimated parameters with their intervals	56
12.3. Identifiability analysis	57
12.4. Uncertainty analysis	60
Chapter 13. Extension number13	61
13.1. Basic information	61
13.2. Estimated parameters with their intervals	61
13.3. Identifiability analysis	62
13.4. Uncertainty analysis	65
Chapter 14. Extension number14	66
14.1. Basic information	66
14.2. Estimated parameters with their intervals	66
14.3. Identifiability analysis	67
14.4. Uncertainty analysis	70

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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 69. The status of the validation is: COMPLETED.

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

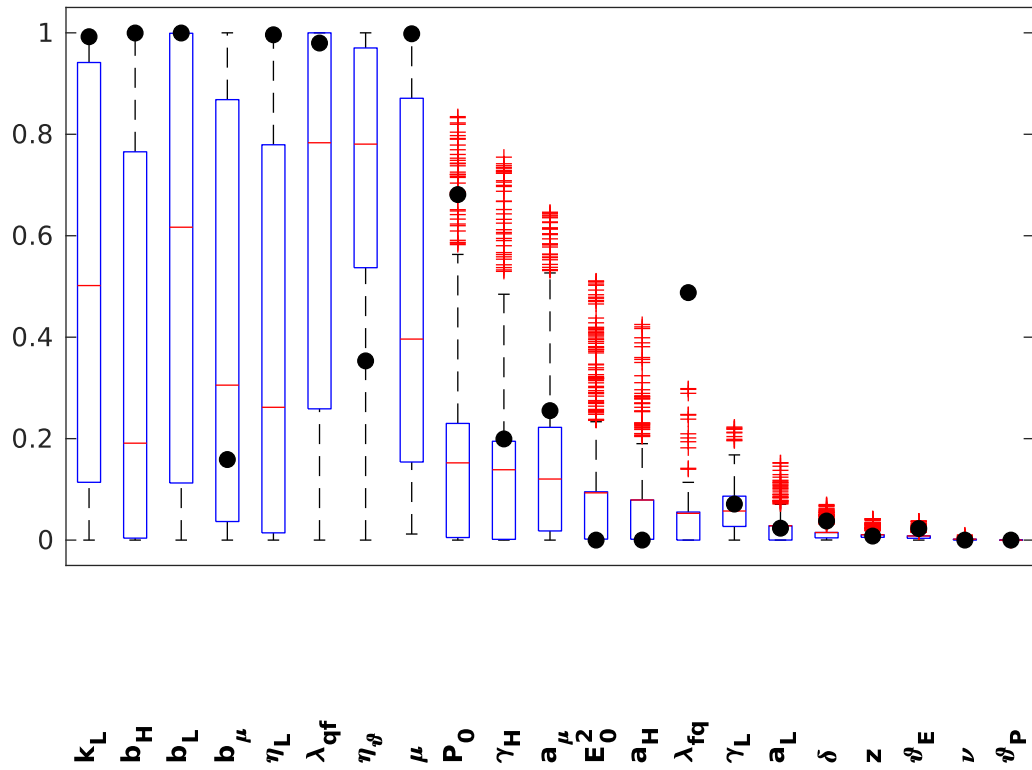
### 1.2. Estimated parameters with their intervals

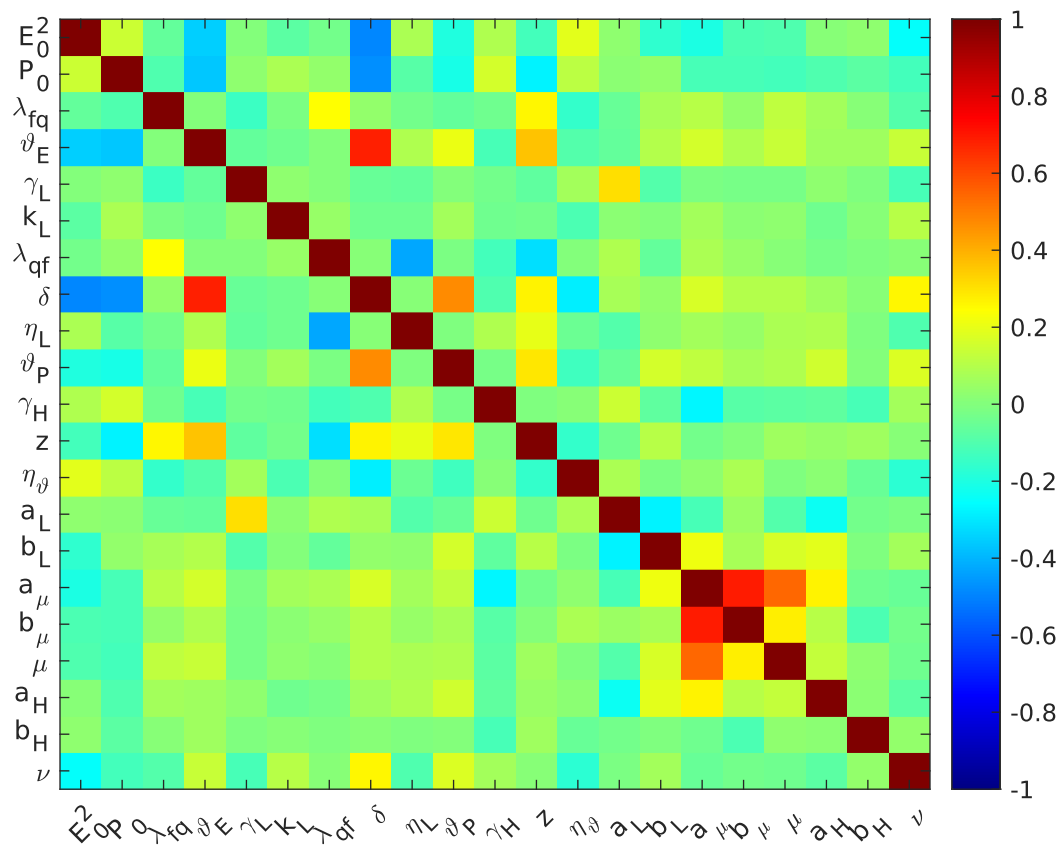
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

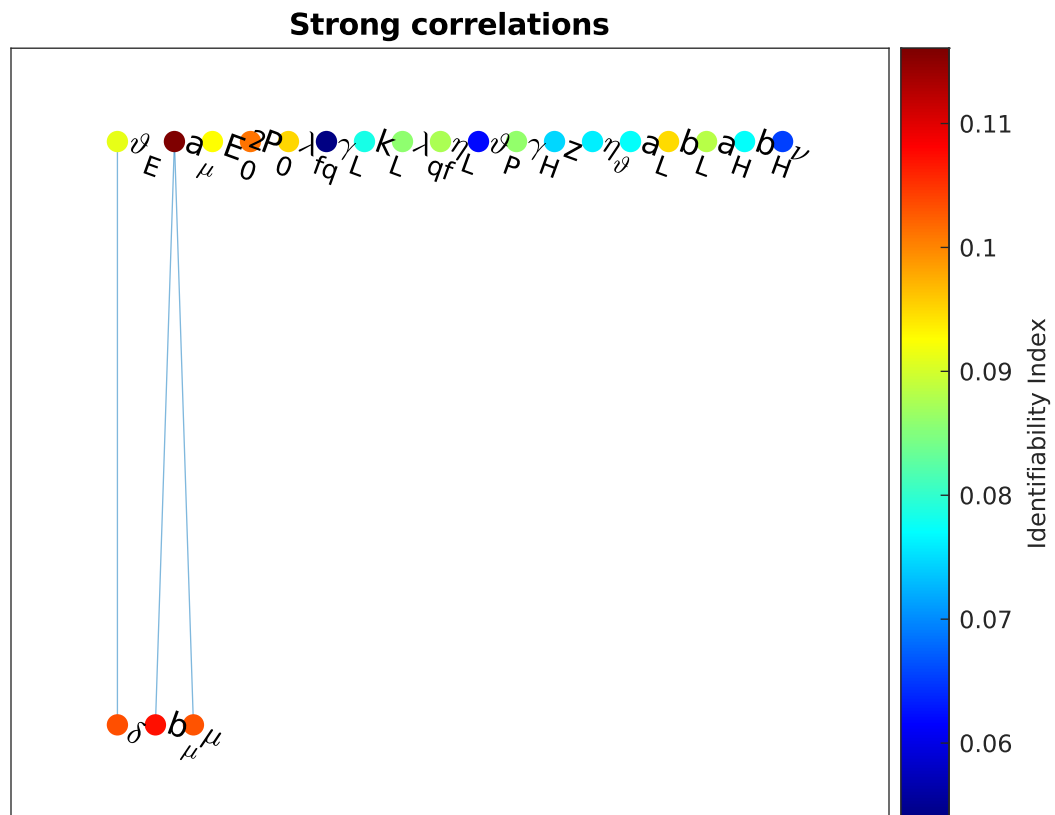
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
E^2_0	'0.0021'	'0.0137'	'187.6816'	'0.0061'	'0.0927'
P_0	'257.3066'	'305.7301'	'61.3895'	'272.4604'	'0.1012'
\lambda_{fq}	'0.4322'	'0.5078'	'0.0553'	'0.4879'	'0.0951'
\vartheta_E	'0.0209'	'0.0267'	'0.0082'	'0.0227'	'0.0911'
\gamma_L	'0.0614'	'0.0711'	'0.0576'	'0.071'	'0.0539'
k_L	'4.5429'	'10'	'5.5161'	'9.9311'	'0.0786'
\lambda_{qf}	'0.8842'	'0.9882'	'0.7833'	'0.9798'	'0.0858'
\delta	'0.0053'	'0.0067'	'0.0023'	'0.0056'	'0.1032'
\eta_L	'0.768'	'1'	'0.2618'	'0.9962'	'0.0876'
\vartheta_P	'0'	'0'	'0'	'0'	'0.0621'
\gamma_H	'0.1523'	'0.1996'	'0.1389'	'0.1994'	'0.086'
z	'0.2247'	'0.2474'	'0.3174'	'0.2381'	'0.0746'
\eta_{\vartheta}	'0.2773'	'0.8458'	'0.7806'	'0.3533'	'0.076'
a_L	'1'	'9.2898'	'1.3961'	'1.3286'	'0.0773'
b_L	'9.9986'	'15'	'9.6352'	'14.9946'	'0.0949'
a_{\mu}	'4.3588'	'6.4785'	'2.6864'	'4.5726'	'0.1161'
b_{\mu}	'3.0521'	'6.1978'	'5.2765'	'3.2234'	'0.1072'
\mu	'0.3839'	'1'	'0.3963'	'0.9981'	'0.103'
a_H	'1'	'1.16'	'2.1078'	'1.0004'	'0.0883'
b_H	'11.9593'	'15'	'3.6749'	'14.995'	'0.0773'
\nu	'0.0001'	'0.002'	'0.9392'	'0.0009'	'0.0654'

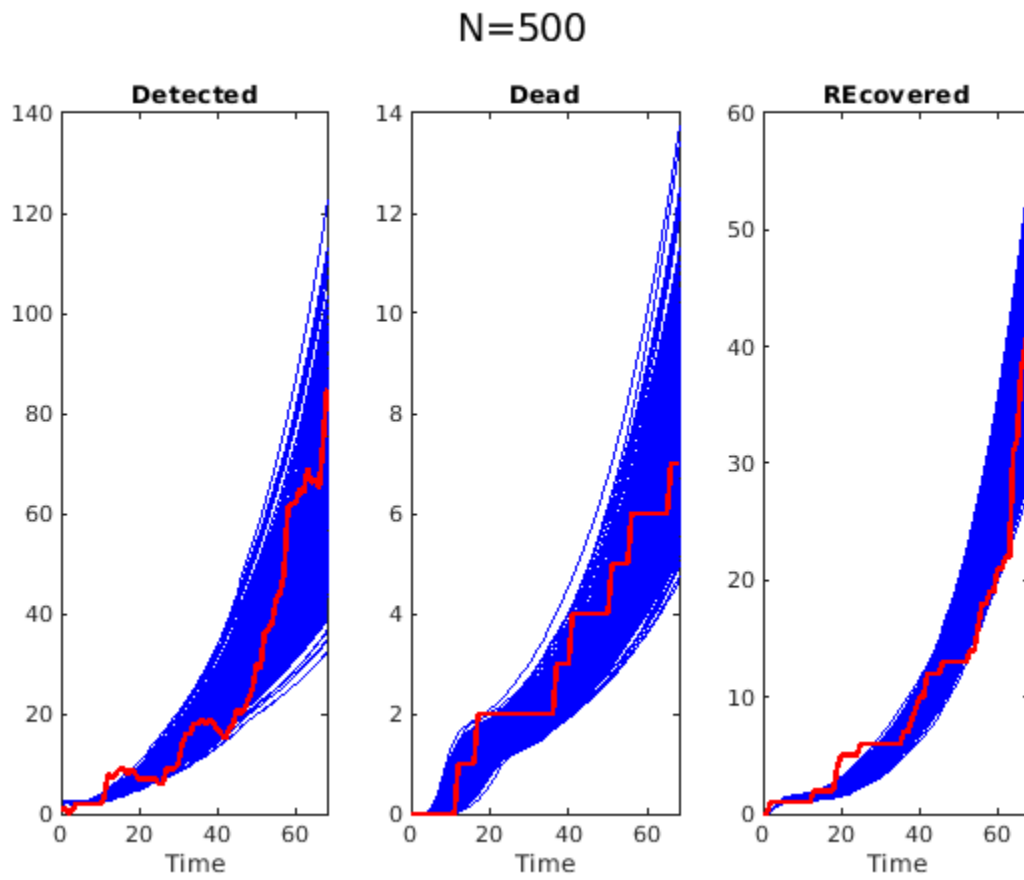
### 1.3. Identifiability analysis







## 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 data69 to the 104. The status of the validation is: COMPLETED.

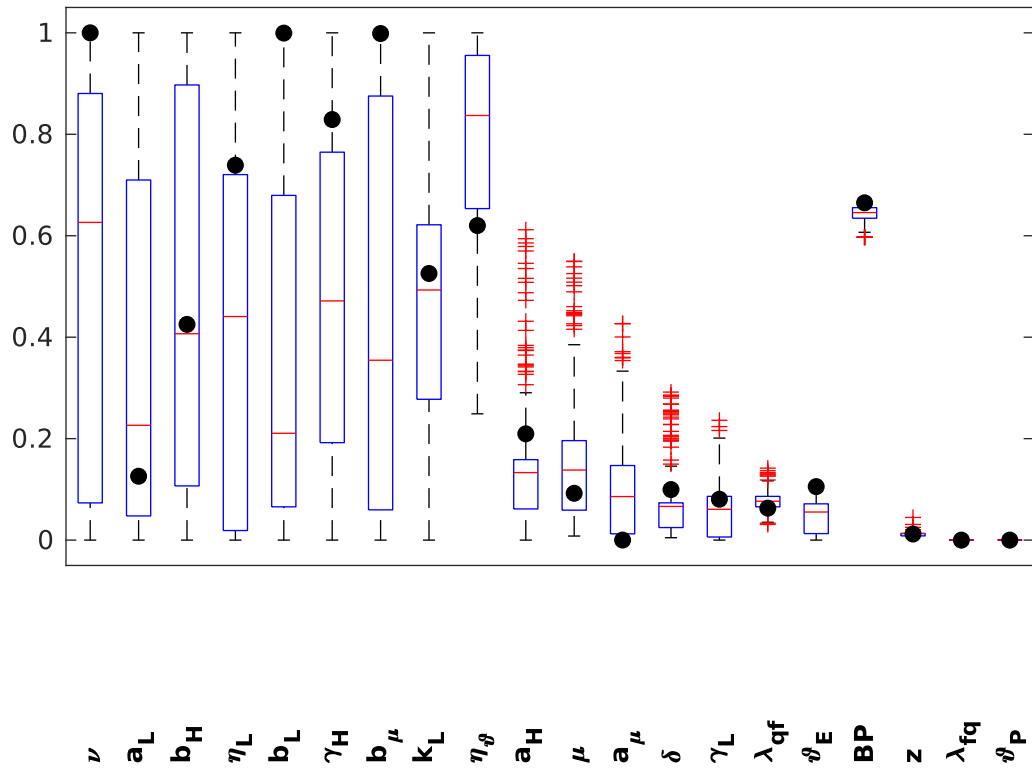
The number of estimations needed to perform the validation was1000.

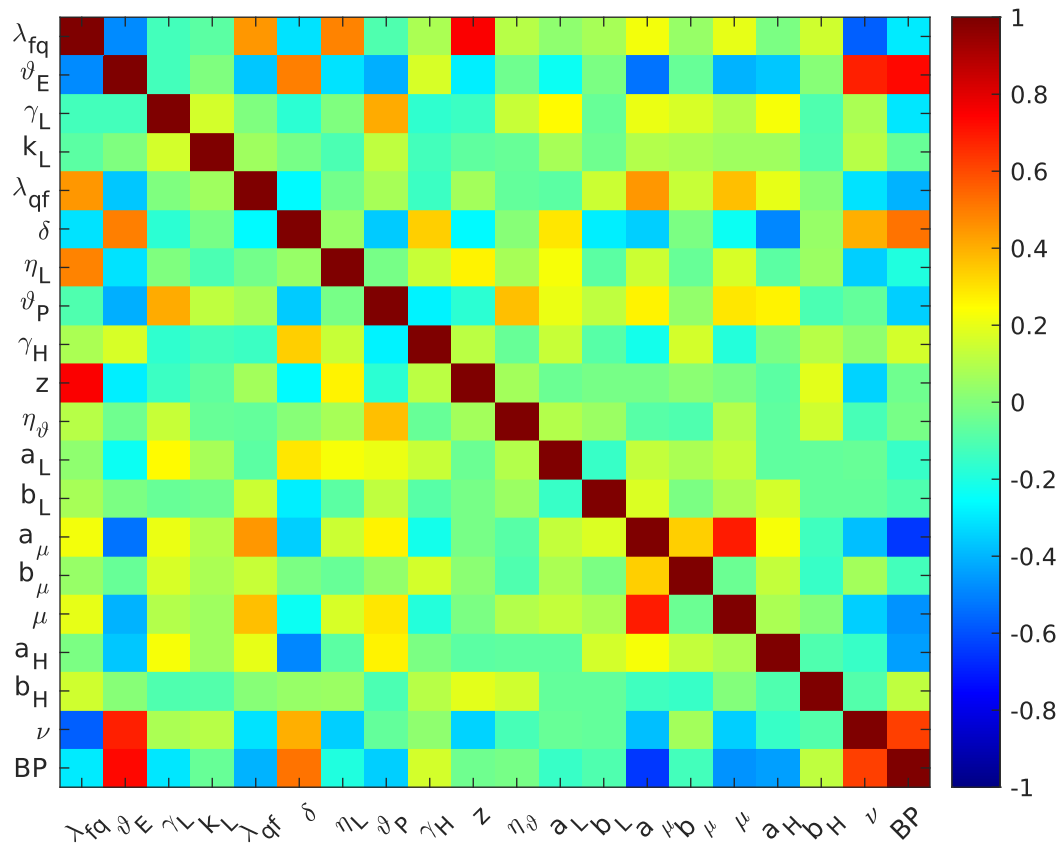
### 2.2. Estimated parameters with their intervals

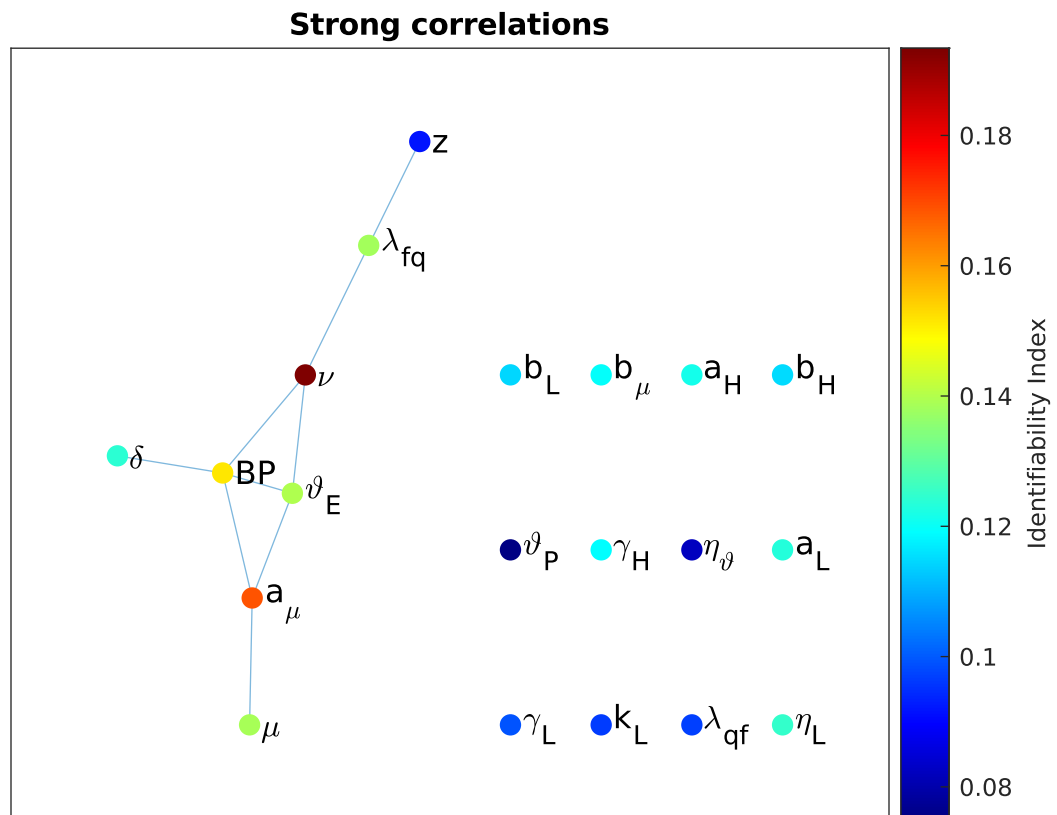
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0625'	'0'	'0'	'0.1383'
$\vartheta_E$	'0.0494'	'0.0613'	'0.0554'	'0.1054'	'0.1395'
$\gamma_L$	'0.0228'	'0.0986'	'0.0607'	'0.0806'	'0.0993'
$k_L$	'4.9568'	'5.9179'	'5.4373'	'5.7306'	'0.0965'
$\lambda_{qf}$	'0.0498'	'0.1033'	'0.0766'	'0.063'	'0.0969'
$\delta$	'0.0061'	'0.0138'	'0.01'	'0.0149'	'0.1244'
$\eta_L$	'0.3758'	'0.5056'	'0.4407'	'0.739'	'0.1252'
$\vartheta_P$	'0'	'0.0002'	'0'	'0'	'0.0752'
$\gamma_H$	'0.4108'	'0.5322'	'0.4715'	'0.8291'	'0.1192'
$z$	'0'	'1.0633'	'0.3923'	'0.3597'	'0.092'
$\eta_{\vartheta}$	'0.8018'	'0.8723'	'0.8371'	'0.62'	'0.0822'
$a_L$	'3.2204'	'5.1167'	'4.1685'	'2.7627'	'0.1236'
$b_L$	'2.9979'	'4.898'	'3.948'	'14.9926'	'0.1146'
$a_{\mu}$	'1.6416'	'2.7611'	'2.2014'	'1.0013'	'0.1689'
$b_{\mu}$	'4.9501'	'6.9779'	'5.964'	'14.9813'	'0.1196'
$\mu$	'0.0865'	'0.1896'	'0.1381'	'0.0923'	'0.1386'
$a_H$	'2.0704'	'3.6552'	'2.8628'	'3.933'	'0.1217'
$b_H$	'5.7343'	'7.655'	'6.6946'	'6.9533'	'0.1149'
$\nu$	'277.5515'	'348.7339'	'313.1427'	'499.9881'	'0.1934'
BP	'66.9704'	'68.0296'	'67.5'	'69.4833'	'0.1517'

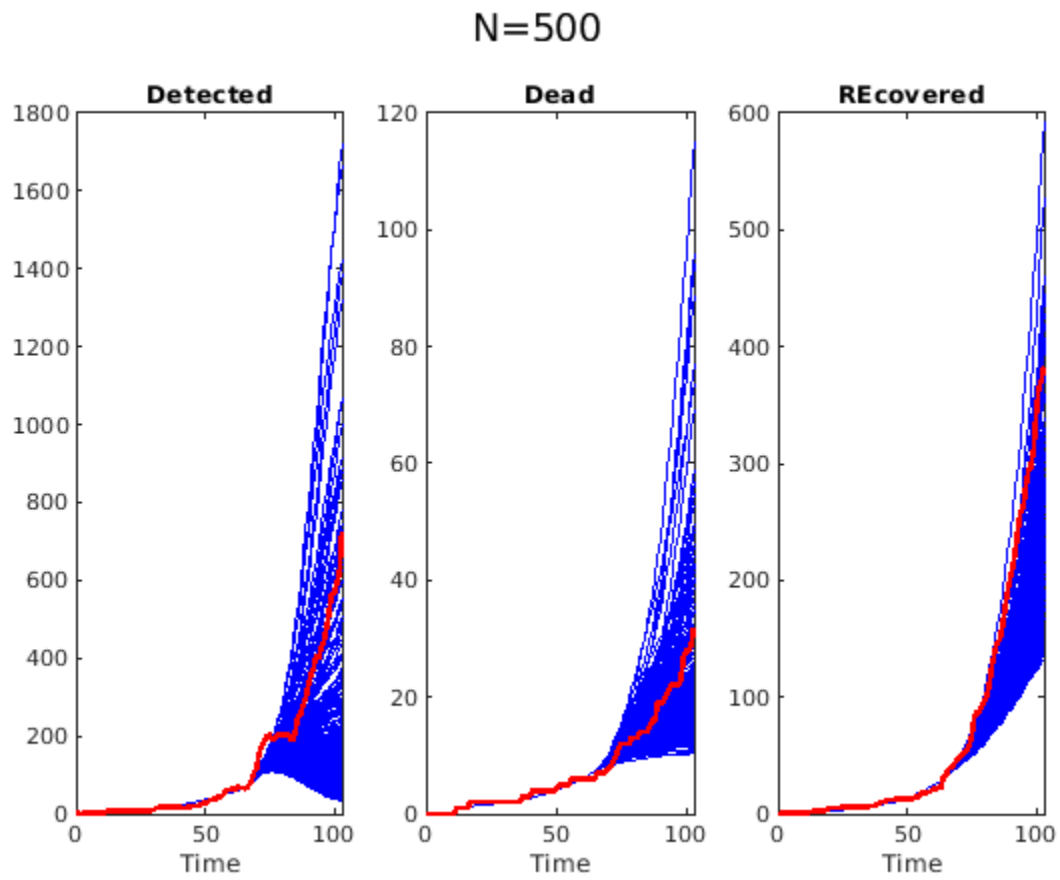
## 2.3. Identifiability analysis







## 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 data104 to the 126. The status of the validation is: COMPLETED.

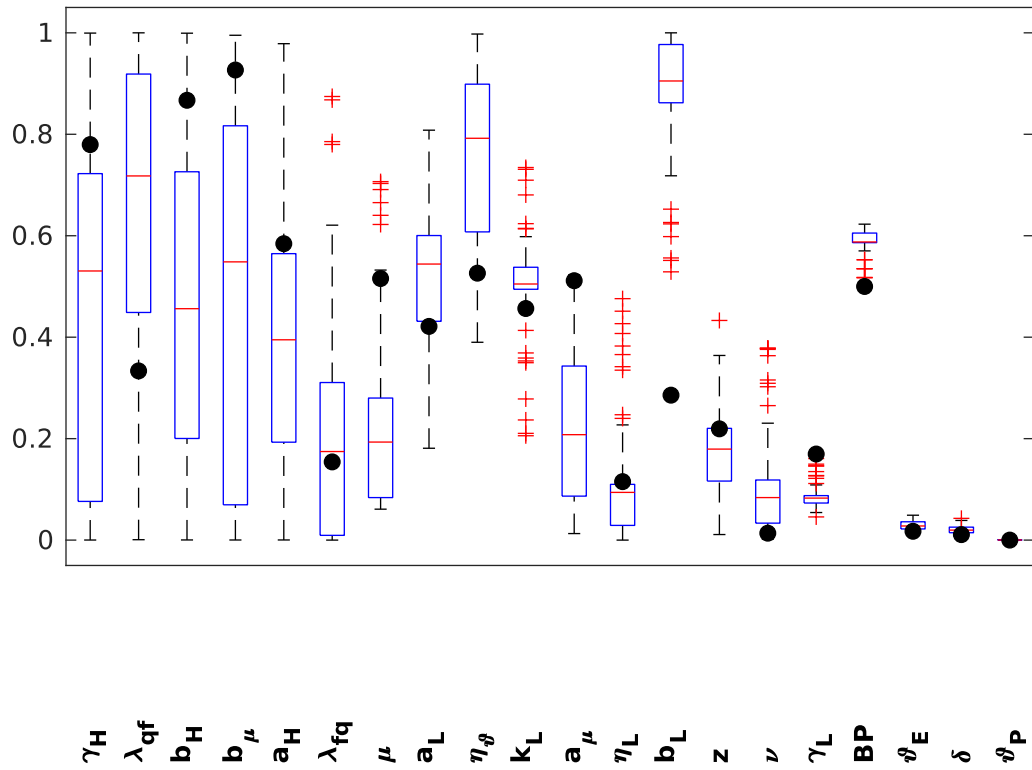
The number of estimations needed to perform the validation was1000.

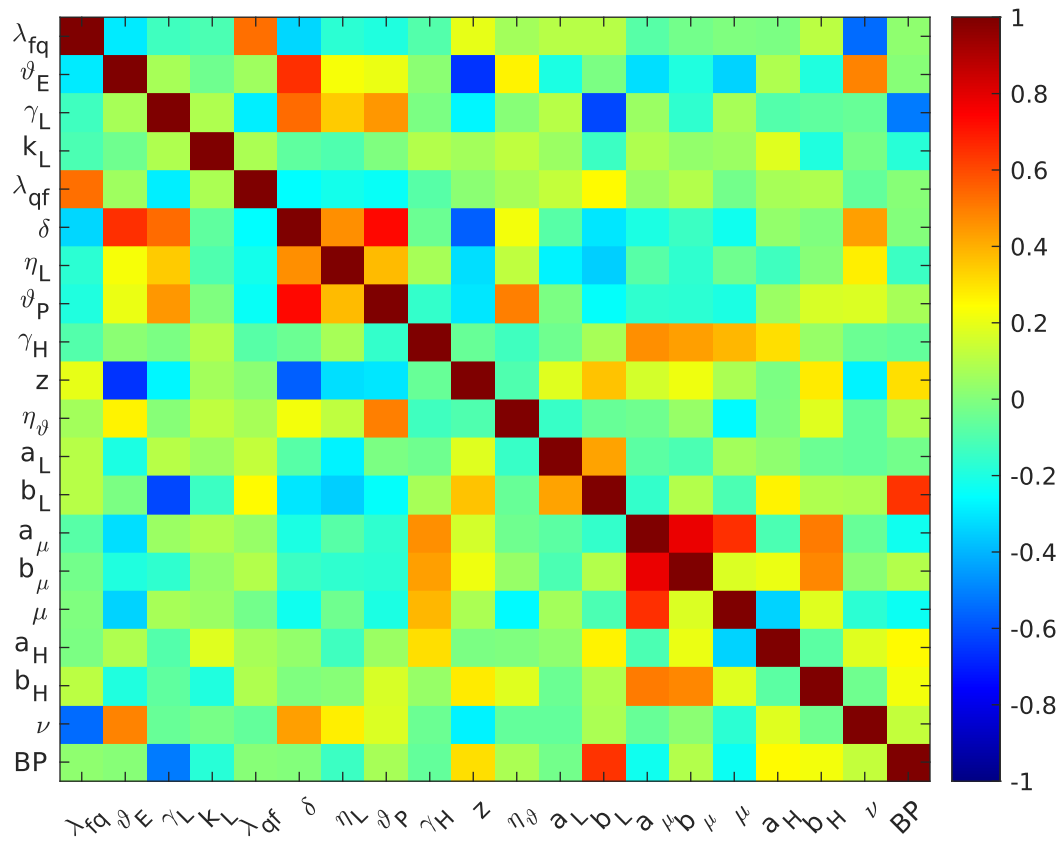
### 3.2. Estimated parameters with their intervals

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

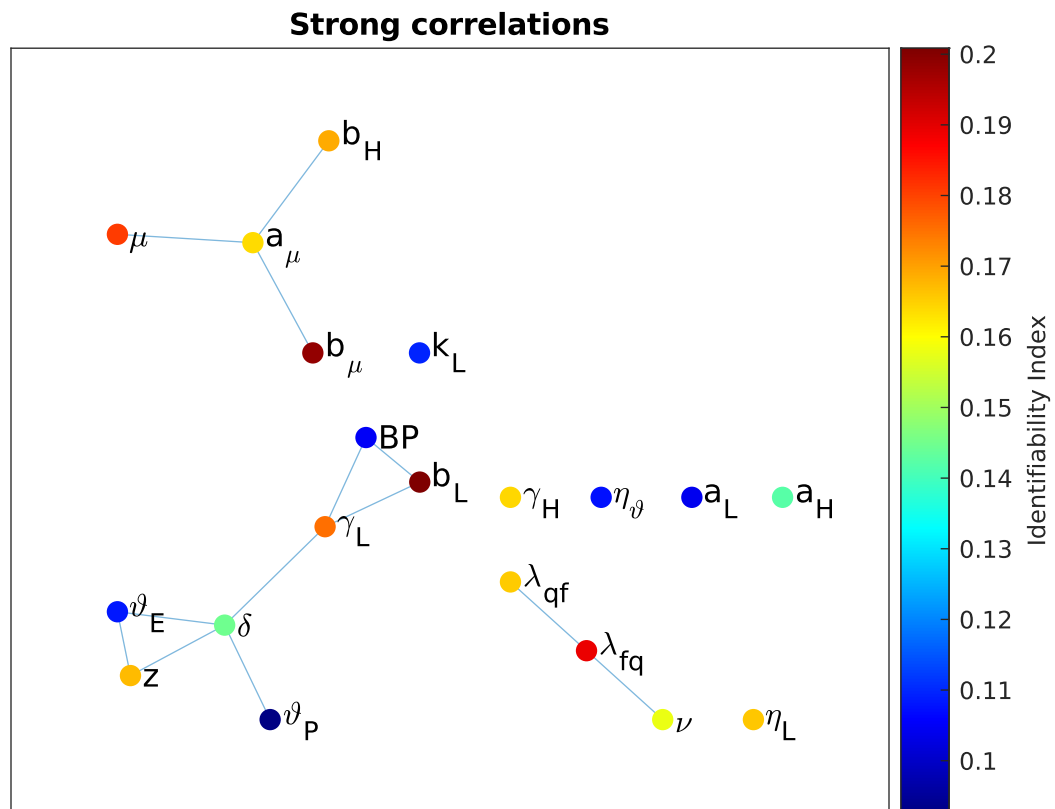
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0745'	'0.2747'	'0.1746'	'0.1542'	'0.1891'
$\vartheta_E$	'0.0236'	'0.0321'	'0.0278'	'0.0174'	'0.1085'
$\gamma_L$	'0.0191'	'0.1465'	'0.0828'	'0.1697'	'0.1753'
$k_L$	'4.9745'	'6.1127'	'5.5436'	'5.1088'	'0.1097'
$\lambda_{qf}$	'0.623'	'0.8128'	'0.7179'	'0.3335'	'0.1655'
$\delta$	'0.0024'	'0.0036'	'0.003'	'0.0016'	'0.1449'
$\eta_L$	'0.0014'	'0.1867'	'0.094'	'0.1152'	'0.1661'
$\vartheta_P$	'0'	'0.0005'	'0.0002'	'0'	'0.0927'
$\gamma_H$	'0.4239'	'0.6372'	'0.5305'	'0.7797'	'0.1643'
$z$	'3.517'	'7.246'	'5.3815'	'6.5797'	'0.1674'
$\eta_{\vartheta}$	'0.7401'	'0.8441'	'0.7921'	'0.5262'	'0.1079'
$a_L$	'7.8829'	'9.3541'	'8.6185'	'6.8979'	'0.1045'
$b_L$	'12.3068'	'15'	'13.6711'	'5'	'0.2008'
$a_{\mu}$	'3.2304'	'4.5888'	'3.9096'	'8.159'	'0.1638'
$b_{\mu}$	'7.0647'	'10.2929'	'8.6788'	'13.9737'	'0.1983'
$\mu$	'0.0951'	'0.2914'	'0.1933'	'0.5156'	'0.1807'
$a_H$	'5.3143'	'7.742'	'6.5282'	'9.1798'	'0.1422'
$b_H$	'6.0665'	'8.7066'	'7.3865'	'13.1383'	'0.1691'
$\nu$	'1.5188'	'82.3006'	'41.9097'	'6.824'	'0.1579'
BP	'101.6547'	'103.3453'	'102.5'	'97.4995'	'0.1054'

### 3.3. Identifiability analysis

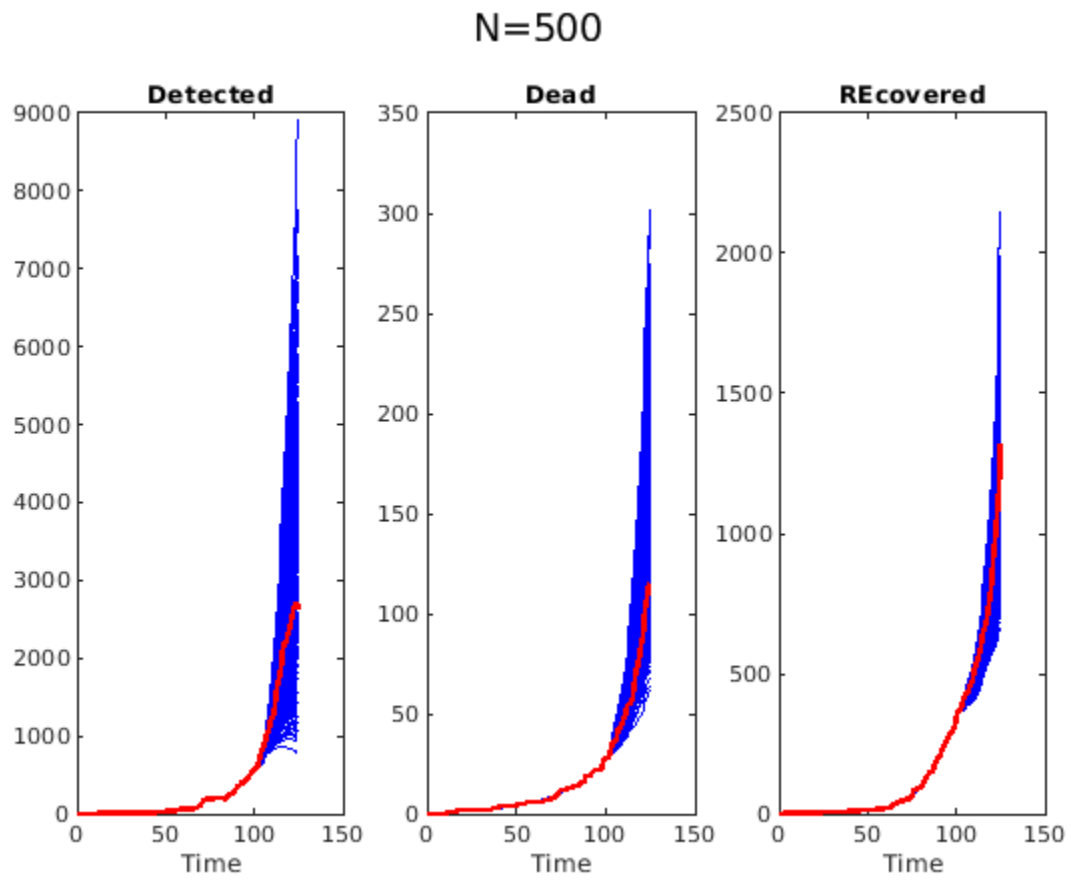








### 3.4. Uncertainty analysis



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## Chapter 4. Extension number4

### 4.1. Basic information

The extension to be validated consists of the time series from the data126 to the 173. The status of the validation is: COMPLETED.

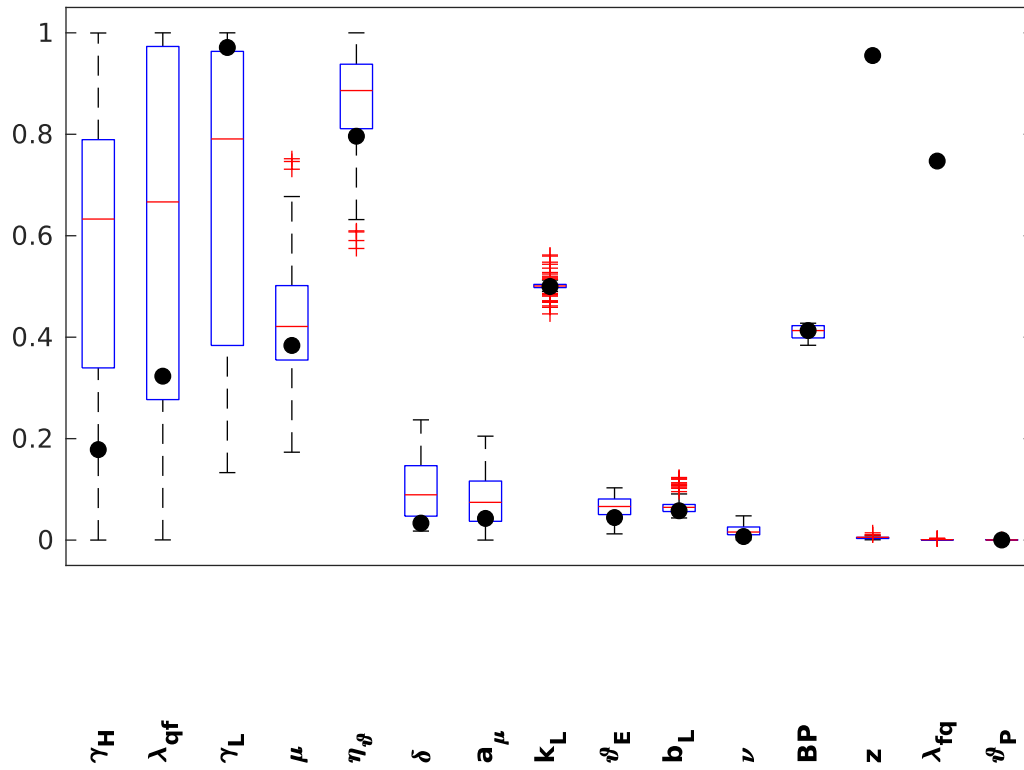
The number of estimations needed to perform the validation was20000.

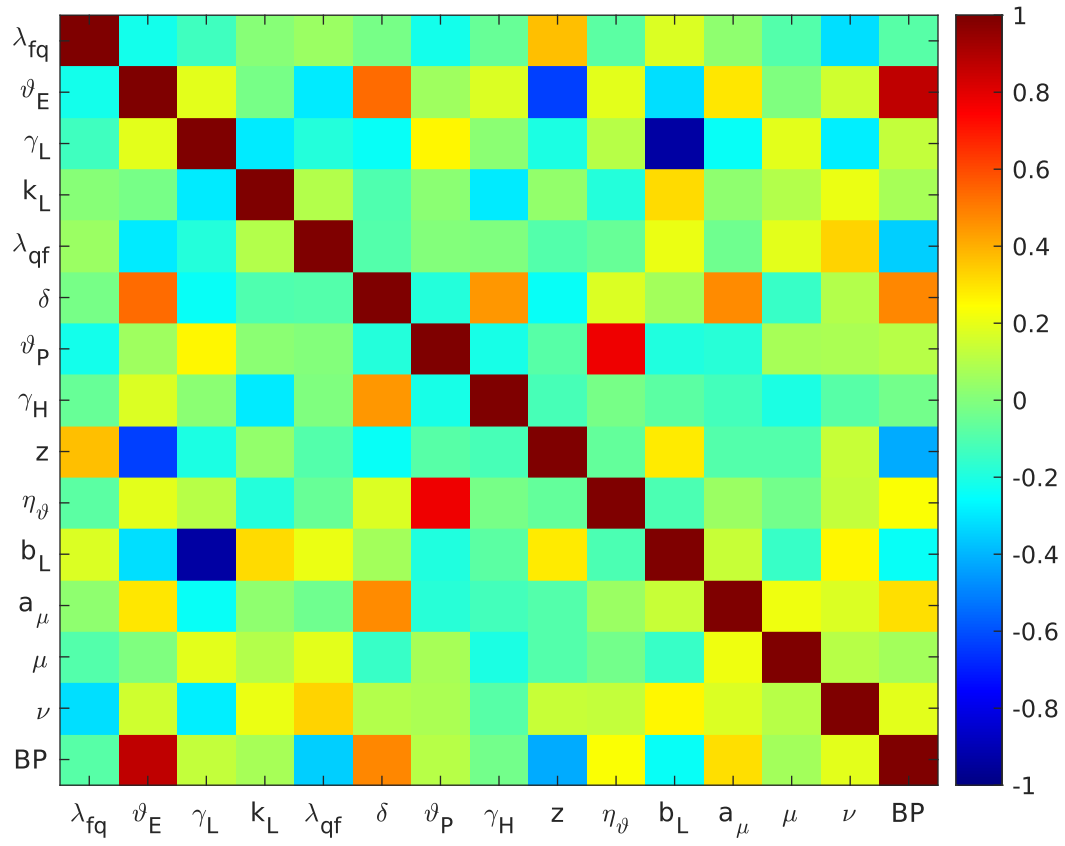
### 4.2. Estimated parameters with their intervals

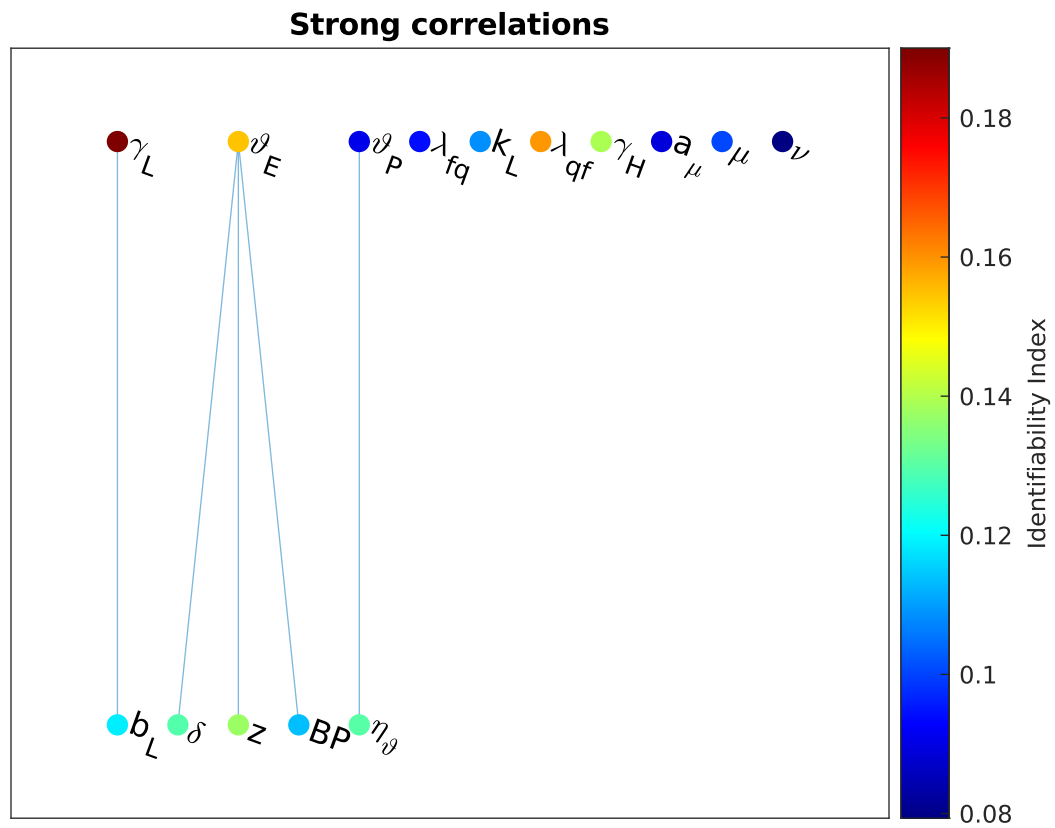
It was necessary to fix 5 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0611'	'0.0008'	'0.7472'	'0.0941'
$\vartheta_E$	'0.0605'	'0.072'	'0.0663'	'0.0444'	'0.1549'
$\gamma_L$	'0.7074'	'0.8742'	'0.7908'	'0.9711'	'0.19'
$k_L$	'5.0982'	'5.9192'	'5.5087'	'5.4991'	'0.1085'
$\lambda_{qf}$	'0.5732'	'0.7601'	'0.6667'	'0.3232'	'0.1597'
$\delta$	'0.0096'	'0.0172'	'0.0134'	'0.005'	'0.1298'
$\eta_L$	'0.419'	'0.419'	'0.419'	'0.419'	'0'
$\vartheta_P$	'0.0002'	'0.0004'	'0.0003'	'0.0002'	'0.0907'
$\gamma_H$	'0.5576'	'0.7082'	'0.6329'	'0.1784'	'0.1393'
$z$	'0'	'2.4133'	'0.1639'	'28.6564'	'0.1375'
$\eta_{\vartheta}$	'0.8425'	'0.9299'	'0.8862'	'0.7962'	'0.1301'
$a_L$	'7.8884'	'7.8884'	'7.8884'	'7.8884'	'0'
$b_L$	'1.7463'	'2.062'	'1.9042'	'1.8096'	'0.119'
$a_{\mu}$	'1.8157'	'2.2683'	'2.042'	'1.5983'	'0.0889'
$b_{\mu}$	'10.1367'	'10.1367'	'10.1367'	'10.1367'	'0'
$\mu$	'0.3812'	'0.461'	'0.4211'	'0.3837'	'0.1006'
$a_H$	'1.9479'	'1.9479'	'1.9479'	'1.9479'	'0'
$b_H$	'11.5341'	'11.5341'	'11.5341'	'11.5341'	'0'
$\nu$	'6.1893'	'9.7117'	'7.9505'	'3.5086'	'0.0793'
BP	'132.236'	'132.764'	'132.5'	'132.4998'	'0.1135'

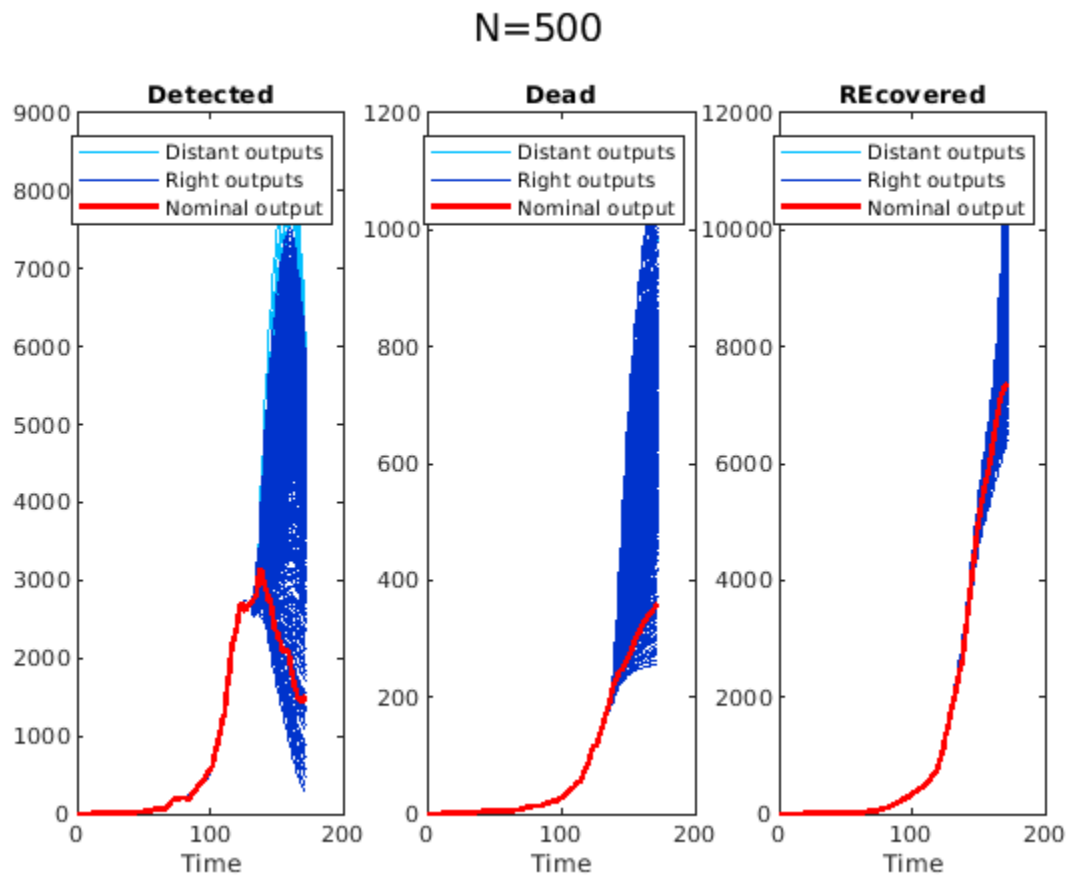
### 4.3. Identifiability analysis







#### 4.4. Uncertainty analysis



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## Chapter 5. Extension number5

### 5.1. Basic information

The extension to be validated consists of the time series from the data173 to the 248. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

### 5.2. Estimated parameters with their intervals

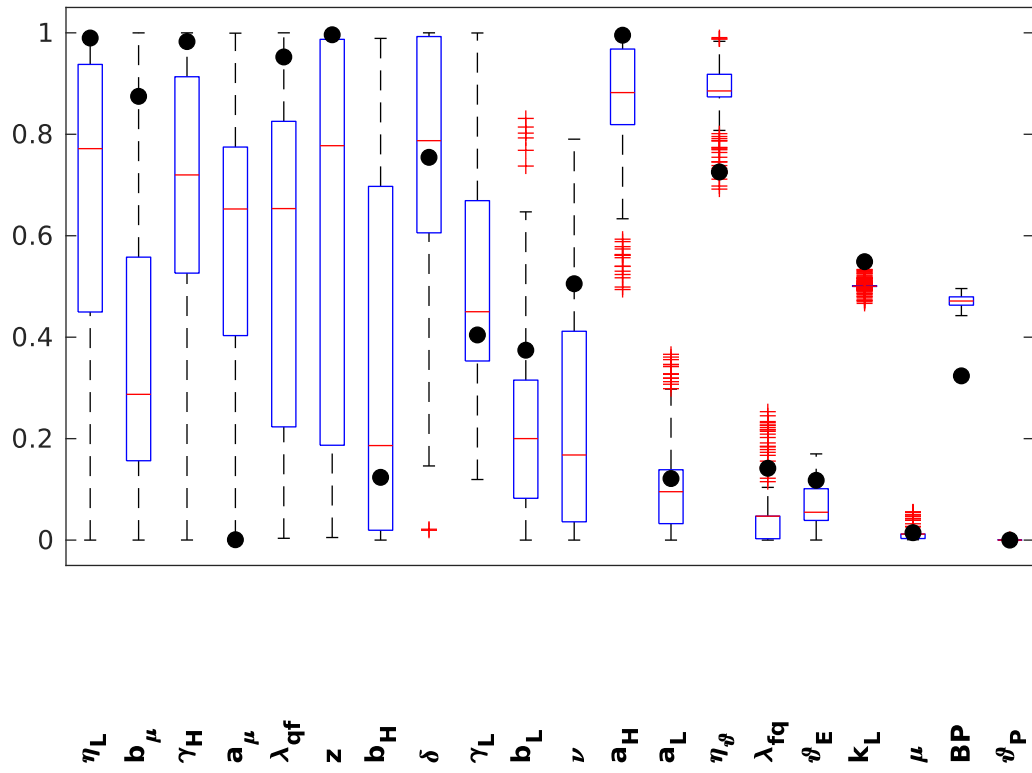
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

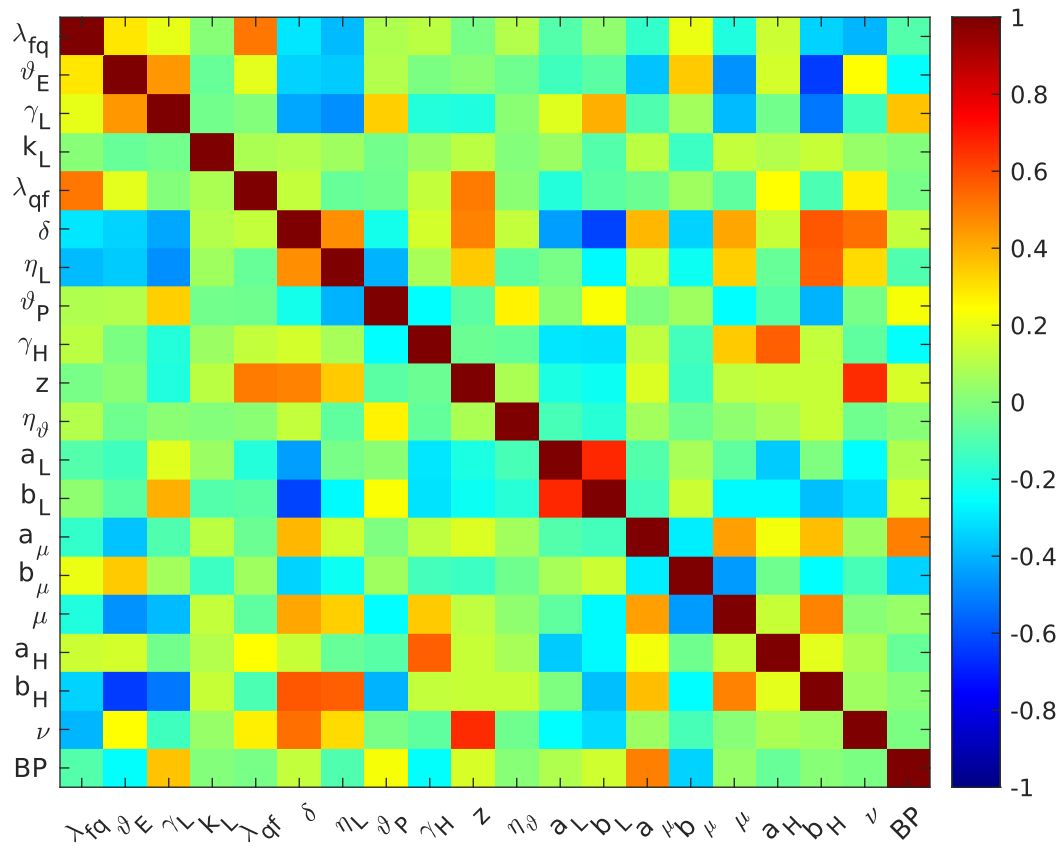
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

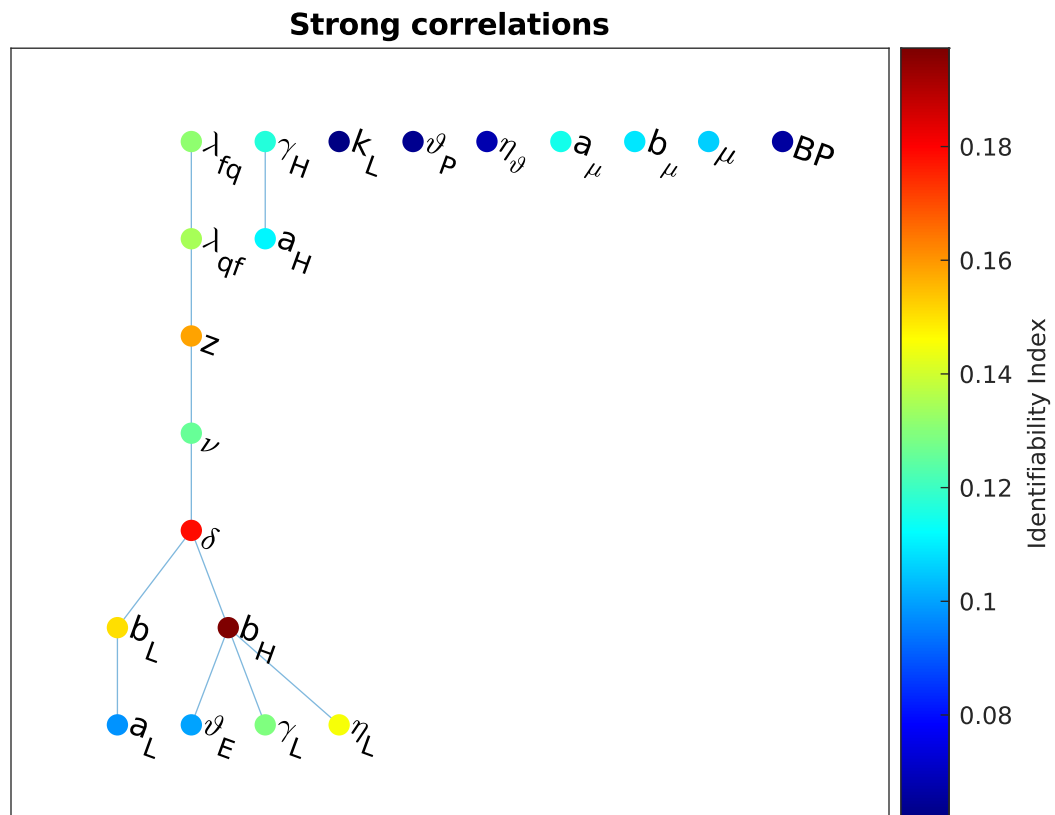
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0654'	'0.1502'	'0.0473'	'0.1416'	'0.1316'
$\vartheta_E$	'0.1113'	'0.2164'	'0.0549'	'0.1178'	'0.1001'
$\gamma_L$	'0.3895'	'0.8611'	'0.4502'	'0.4044'	'0.1291'
$k_L$	'1'	'10'	'5.5034'	'5.9397'	'0.0618'
$\lambda_{qf}$	'0.6447'	'1'	'0.6535'	'0.9524'	'0.1347'
$\delta$	'0.0657'	'0.136'	'0.1181'	'0.1132'	'0.1785'
$\eta_L$	'0.28'	'1'	'0.7717'	'0.9898'	'0.145'
$\vartheta_P$	'0'	'0'	'0.0001'	'0'	'0.0639'
$\gamma_H$	'0.2542'	'1'	'0.7199'	'0.9828'	'0.1174'
$z$	'13.8801'	'30'	'23.3249'	'29.8854'	'0.1582'
$\eta_{\vartheta}$	'0.4202'	'1'	'0.8853'	'0.7257'	'0.068'
$a_L$	'2.2992'	'6.9046'	'2.3427'	'2.699'	'0.0979'
$b_L$	'4.1267'	'10.2767'	'3.8031'	'6.241'	'0.1503'
$a_{\mu}$	'1'	'13.096'	'10.1384'	'1.0103'	'0.1151'
$b_{\mu}$	'3.64'	'15'	'5.0228'	'13.247'	'0.1091'
$\mu$	'0'	'0.0173'	'0.012'	'0.0146'	'0.1062'
$a_H$	'7.6107'	'15'	'13.3503'	'14.9343'	'0.1111'
$b_H$	'1'	'5.516'	'3.609'	'2.732'	'0.1973'
$\nu$	'193.6613'	'252.8453'	'83.8979'	'252.6957'	'0.1259'
BP	'159.9395'	'209.2745'	'183.5'	'165.5'	'0.0656'



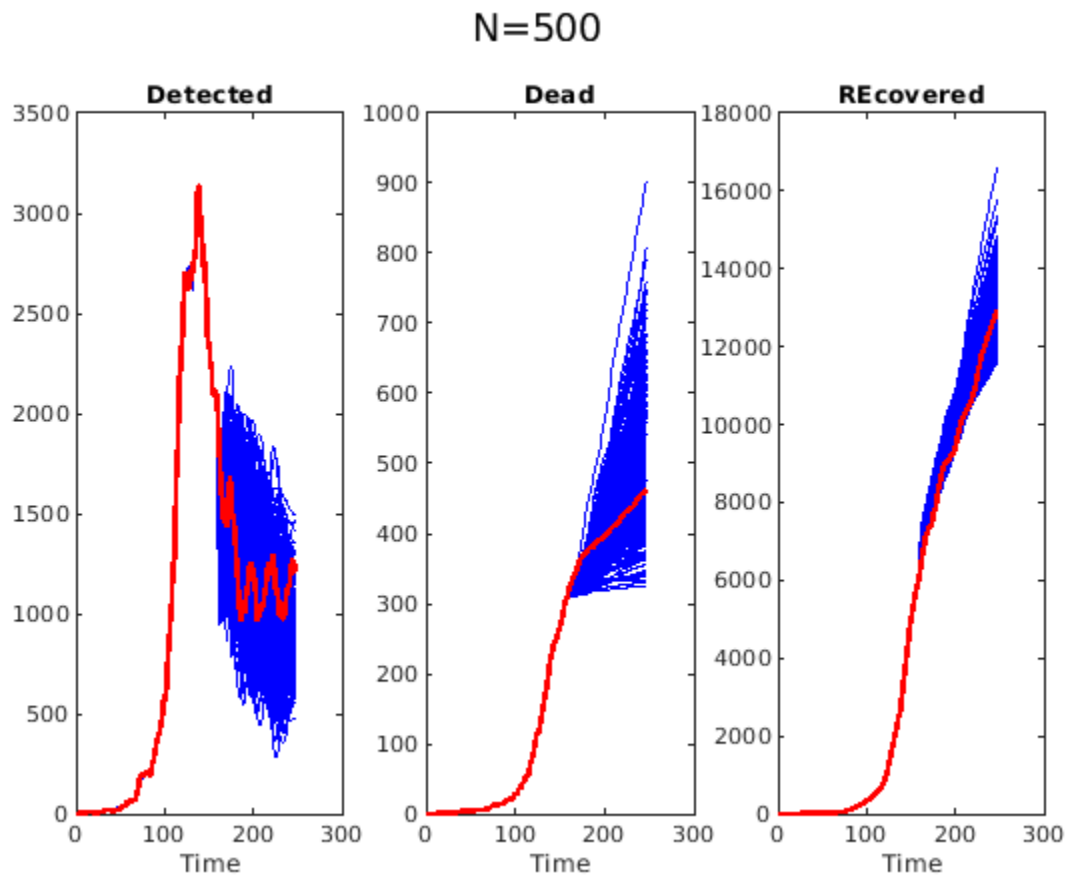
### 5.3. Identifiability analysis







## 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 data248 to the 287. The status of the validation is: COMPLETED.

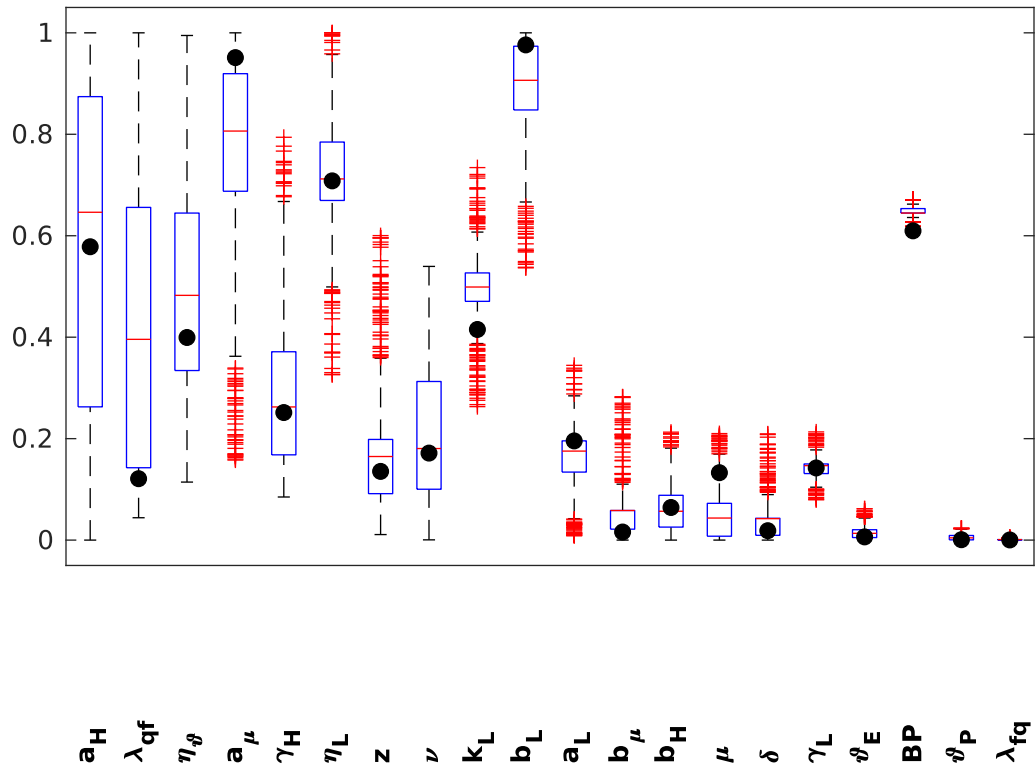
The number of estimations needed to perform the validation was1000.

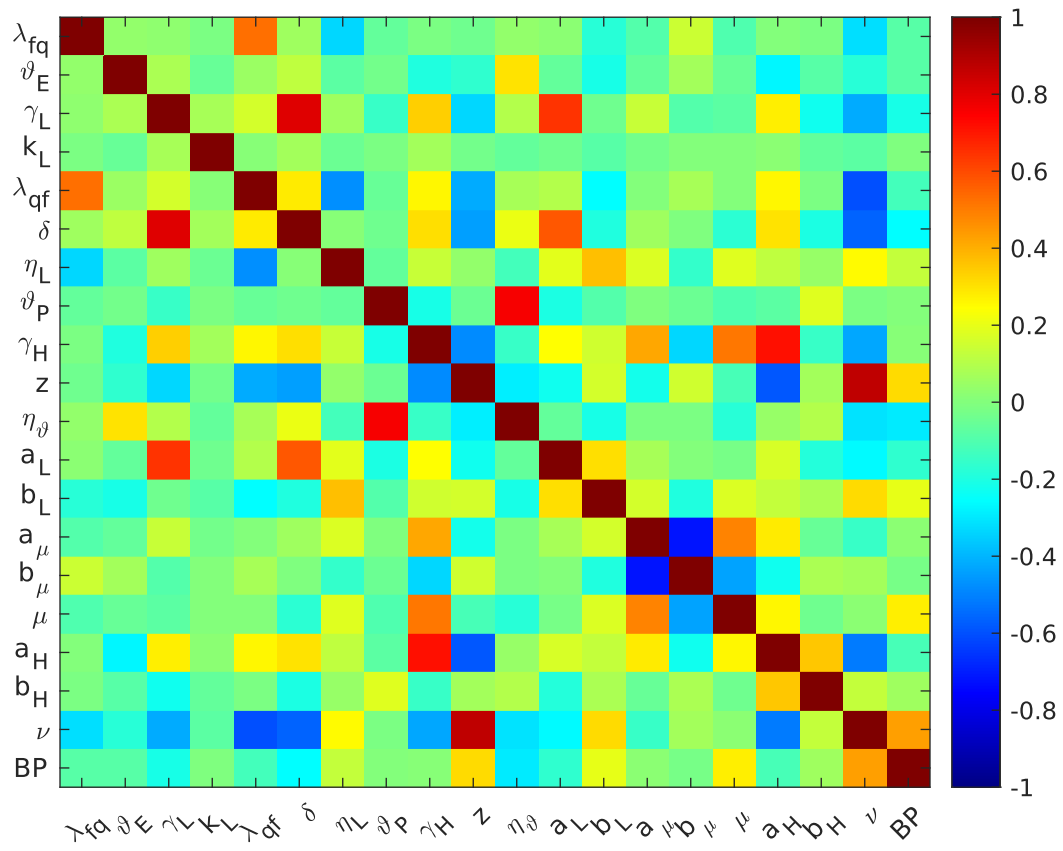
### 6.2. Estimated parameters with their intervals

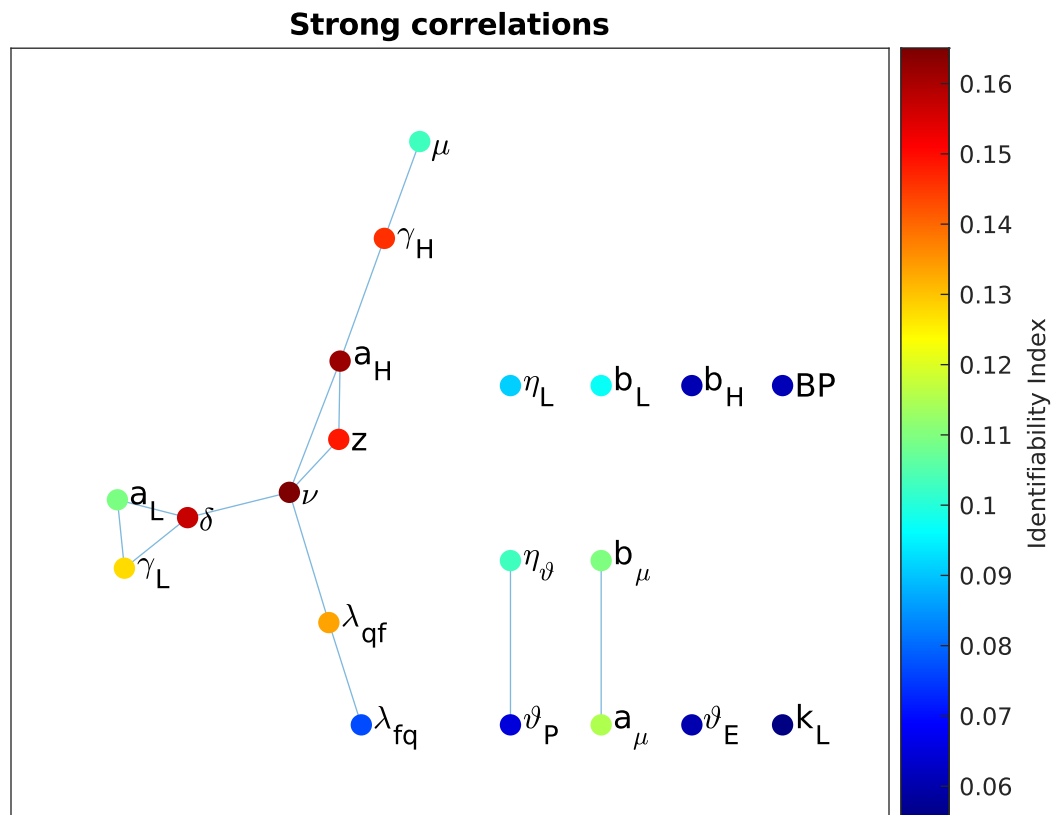
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0275'	'0.001'	'0.0003'	'0.0772'
$\vartheta_E$	'0.0046'	'0.0221'	'0.0134'	'0.0063'	'0.0605'
$\gamma_L$	'0.1219'	'0.1717'	'0.1468'	'0.1422'	'0.1277'
$k_L$	'5.2977'	'5.6828'	'5.4902'	'4.7369'	'0.0554'
$\lambda_{qf}$	'0.3592'	'0.4324'	'0.3958'	'0.121'	'0.1334'
$\delta$	'0.0009'	'0.0118'	'0.0063'	'0.0028'	'0.1569'
$\eta_L$	'0.683'	'0.741'	'0.712'	'0.7082'	'0.0912'
$\vartheta_P$	'0.0029'	'0.0059'	'0.0044'	'0.0008'	'0.0652'
$\gamma_H$	'0.2302'	'0.2948'	'0.2625'	'0.2514'	'0.146'
$z$	'3.8426'	'6.0443'	'4.9434'	'4.0634'	'0.1487'
$\eta_{\vartheta}$	'0.4579'	'0.5071'	'0.4825'	'0.3994'	'0.1033'
$a_L$	'3.2398'	'3.6731'	'3.4564'	'3.7372'	'0.1094'
$b_L$	'13.2897'	'14.0899'	'13.6898'	'14.6667'	'0.0972'
$a_{\mu}$	'11.7535'	'12.8244'	'12.289'	'14.3157'	'0.115'
$b_{\mu}$	'1.2934'	'2.3405'	'1.8169'	'1.2228'	'0.11'
$\mu$	'0.0179'	'0.0691'	'0.0435'	'0.1329'	'0.1031'
$a_H$	'9.4827'	'10.6132'	'10.0479'	'9.0961'	'0.1618'
$b_H$	'1.6634'	'1.9289'	'1.7961'	'1.9002'	'0.0607'
$\nu$	'82.1287'	'98.3753'	'90.252'	'85.7623'	'0.165'
BP	'246.3352'	'246.6648'	'246.5'	'242.5'	'0.0611'

### 6.3. Identifiability analysys

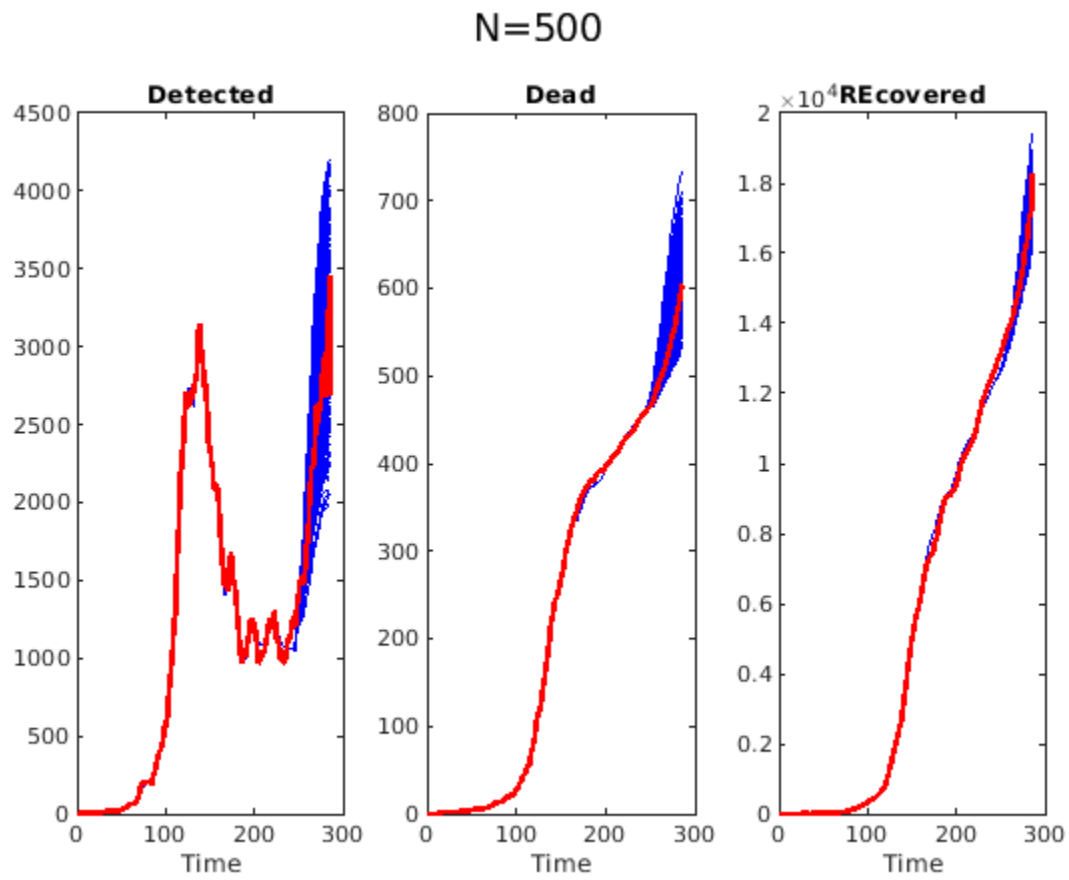








## 6.4. Uncertainty analysys



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## Chapter 7. Extension number7

### 7.1. Basic information

The extension to be validated consists of the time series from the data287 to the 308. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

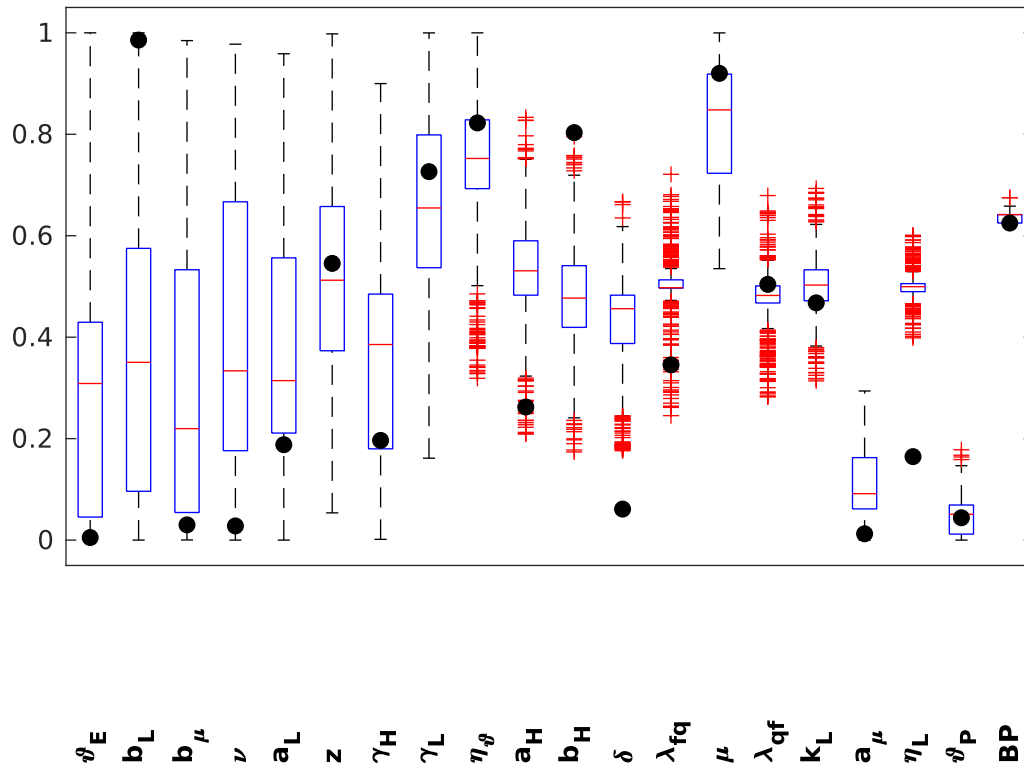
### 7.2. Estimated parameters with their intervals

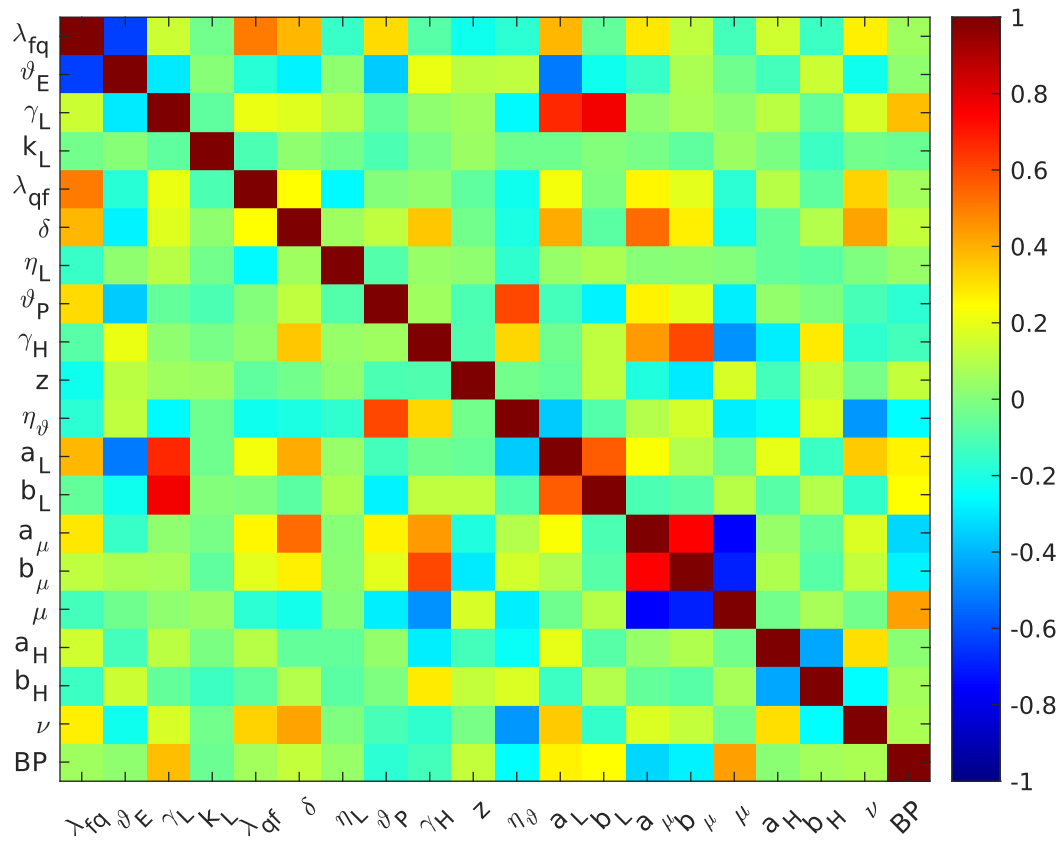
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

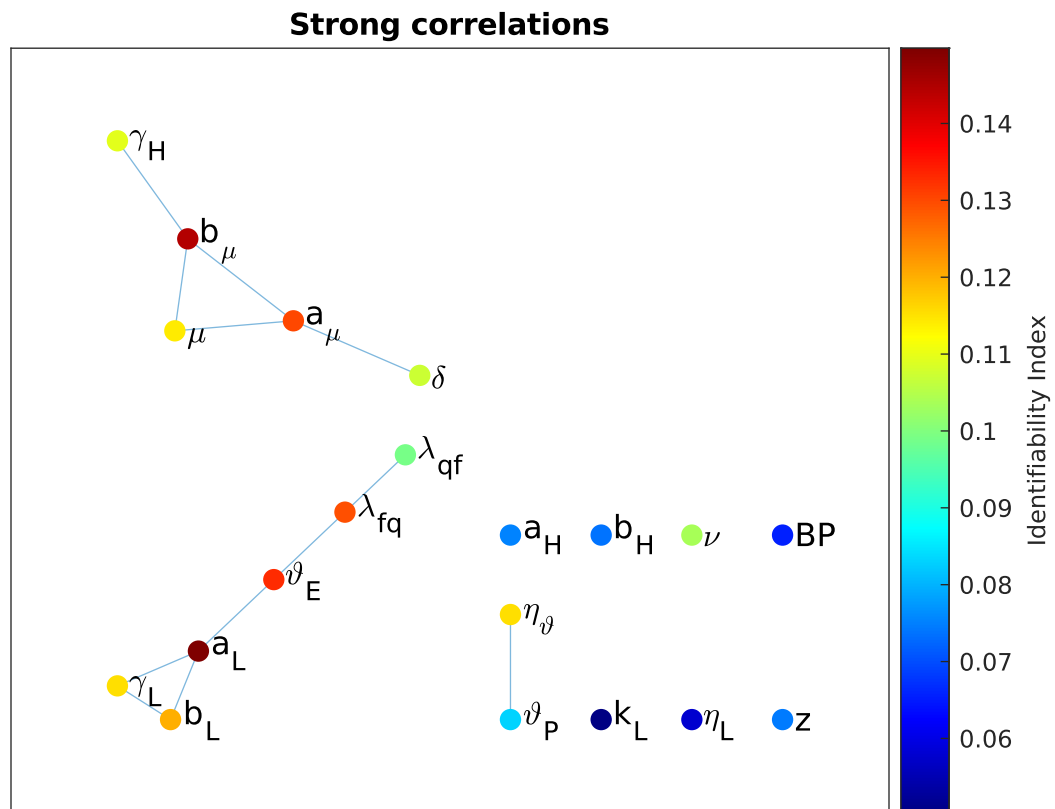
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1705'	'1'	'0.4974'	'0.3456'	'0.1294'
$\vartheta_E$	'0'	'0.0113'	'0.3087'	'0.005'	'0.1331'
$\gamma_L$	'0.3707'	'0.9424'	'0.6547'	'0.7263'	'0.1156'
$k_L$	'1'	'9.64'	'5.5249'	'5.209'	'0.0504'
$\lambda_{qf}$	'0'	'0.8664'	'0.4822'	'0.5041'	'0.0991'
$\delta$	'0.0008'	'0.0206'	'0.0684'	'0.0092'	'0.1074'
$\eta_L$	'0'	'0.3703'	'0.4996'	'0.1646'	'0.0581'
$\vartheta_P$	'0.0167'	'0.1011'	'0.051'	'0.0441'	'0.0833'
$\gamma_H$	'0'	'0.4423'	'0.3859'	'0.1966'	'0.1095'
$z$	'0'	'18.7304'	'15.3701'	'16.3632'	'0.0746'
$\eta_{\vartheta}$	'0.4625'	'0.9731'	'0.7523'	'0.8224'	'0.1156'
$a_L$	'1.3711'	'5.5354'	'5.4011'	'3.6328'	'0.1498'
$b_L$	'7.9454'	'15'	'5.9063'	'14.8'	'0.12'
$a_{\mu}$	'1'	'14.44'	'2.2812'	'1.1745'	'0.1303'
$b_{\mu}$	'1'	'15'	'4.0762'	'1.421'	'0.1444'
$\mu$	'0'	'0.96'	'0.848'	'0.9201'	'0.1141'
$a_H$	'1'	'14.44'	'8.4319'	'4.674'	'0.0756'
$b_H$	'1'	'14.44'	'7.6792'	'12.2458'	'0.0737'
$\nu$	'11.7145'	'49.6422'	'166.8394'	'13.9603'	'0.1036'
BP	'284.4584'	'294.6791'	'286.5'	'285.5'	'0.0657'

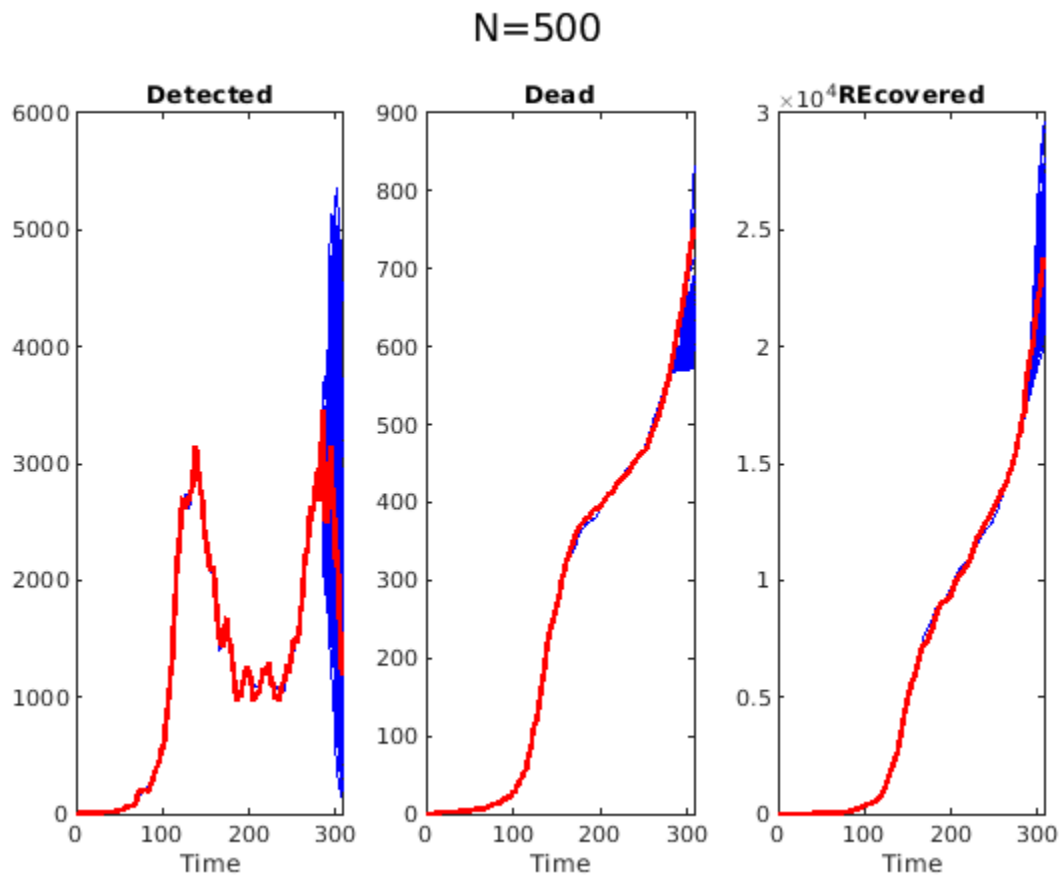
### 7.3. Identifiability analysis







## 7.4. Uncertainty analysys



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## Chapter 8. Extension number8

### 8.1. Basic information

The extension to be validated consists of the time series from the data308 to the 324. The status of the validation is: COMPLETED.

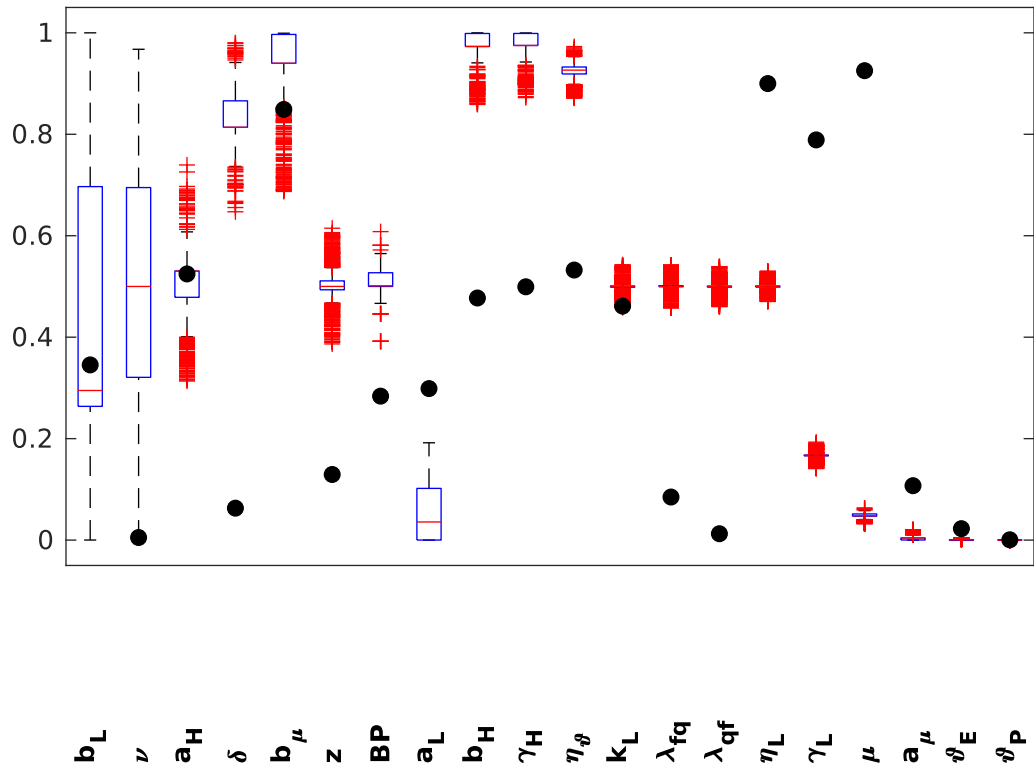
The number of estimations needed to perform the validation was1000.

### 8.2. Estimated parameters with their intervals

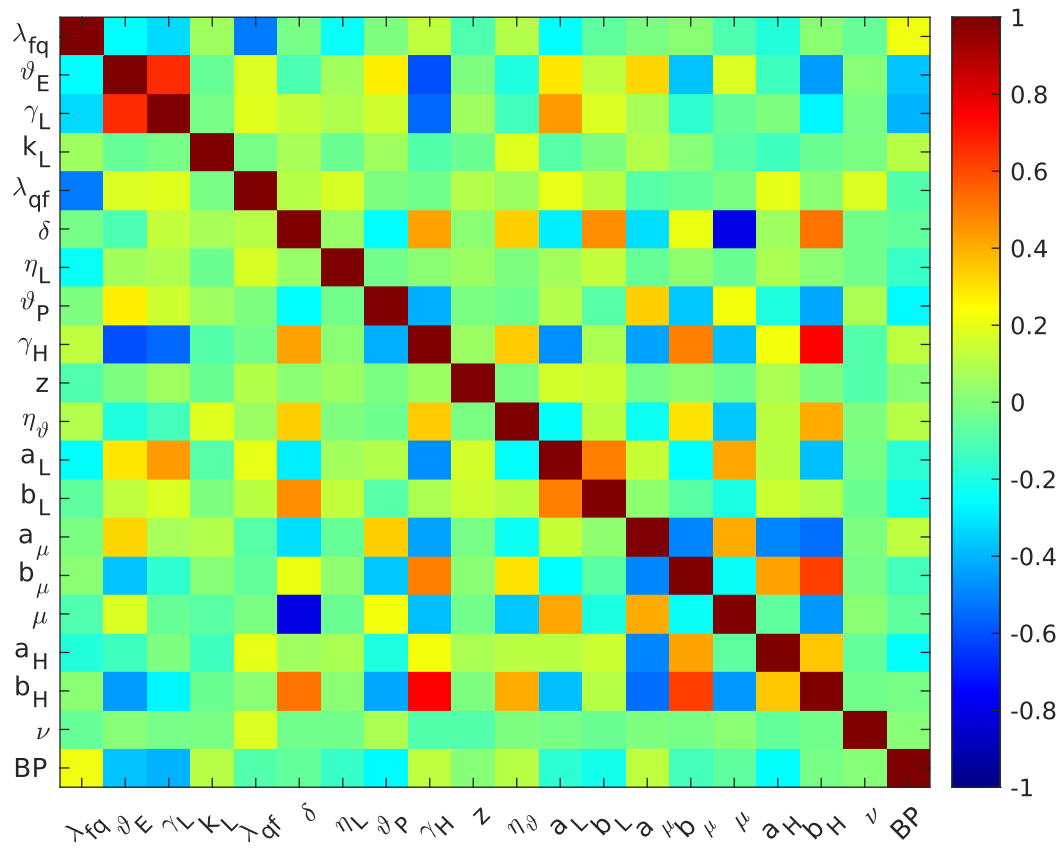
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

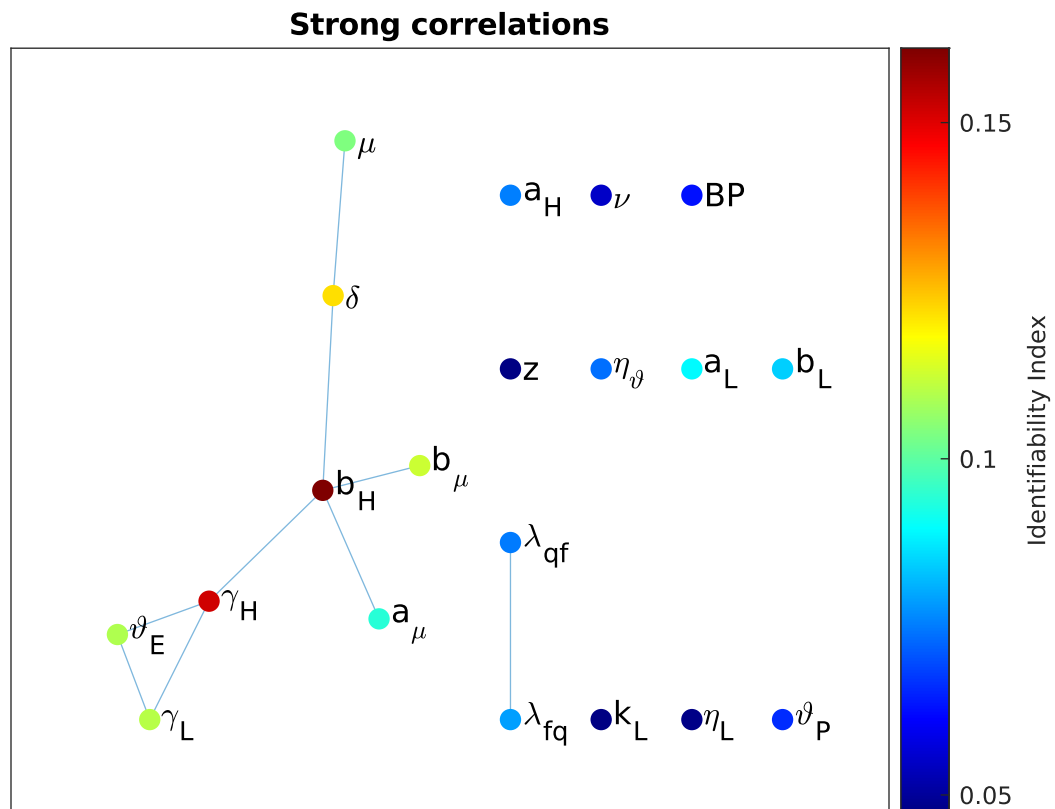
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.4912'	'0.5089'	'0.5'	'0.0849'	'0.079'
$\vartheta_E$	'0'	'0.0029'	'0.0006'	'0.0225'	'0.1093'
$\gamma_L$	'0.156'	'0.1792'	'0.1676'	'0.7889'	'0.1101'
$k_L$	'5.431'	'5.569'	'5.5'	'5.1516'	'0.0474'
$\lambda_{qf}$	'0.4909'	'0.509'	'0.4999'	'0.0126'	'0.075'
$\delta$	'0.1193'	'0.1249'	'0.1221'	'0.0094'	'0.1217'
$\eta_L$	'0.4937'	'0.5063'	'0.5'	'0.9'	'0.0481'
$\vartheta_P$	'0'	'0.0001'	'0'	'0.0006'	'0.0661'
$\gamma_H$	'0.9567'	'0.9934'	'0.975'	'0.4993'	'0.1519'
$z$	'14.6992'	'15.3058'	'15.0025'	'3.8807'	'0.0476'
$\eta_{\vartheta}$	'0.9185'	'0.9344'	'0.9264'	'0.5324'	'0.0737'
$a_L$	'1.3996'	'1.6014'	'1.5005'	'5.1819'	'0.0893'
$b_L$	'4.7866'	'5.4719'	'5.1293'	'5.8352'	'0.0844'
$a_{\mu}$	'1'	'1.1341'	'1.0593'	'2.5019'	'0.0944'
$b_{\mu}$	'13.8585'	'14.4597'	'14.1591'	'12.8854'	'0.1123'
$\mu$	'0.033'	'0.063'	'0.048'	'0.9254'	'0.1041'
$a_H$	'8.2906'	'8.5531'	'8.4218'	'8.3456'	'0.0755'
$b_H$	'14.3686'	'14.8772'	'14.6229'	'7.6816'	'0.1611'
$\nu$	'239.8375'	'260.1683'	'250.0029'	'2.5418'	'0.0552'
BP	'305.4574'	'305.6429'	'305.5502'	'297.4999'	'0.0634'

### 8.3. Identifiability analysis

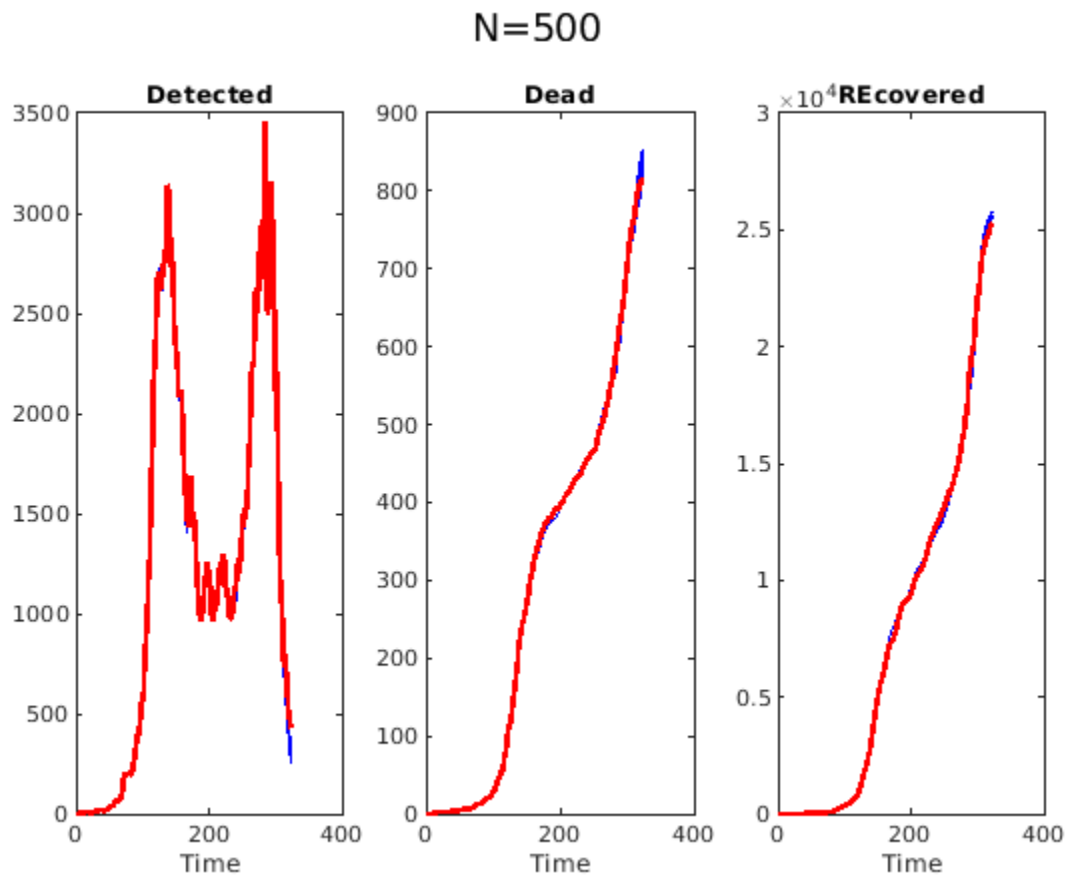








## 8.4. Uncertainty analysis



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## Chapter 9. Extension number9

### 9.1. Basic information

The extension to be validated consists of the time series from the data324 to the 392. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

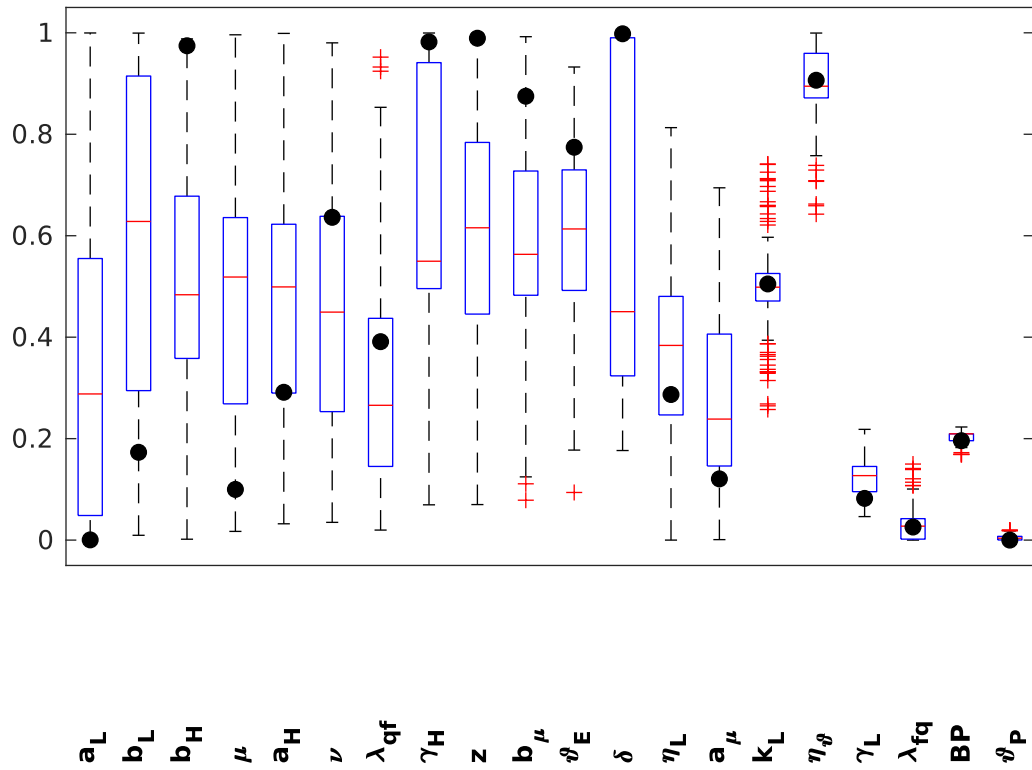
### 9.2. Estimated parameters with their intervals

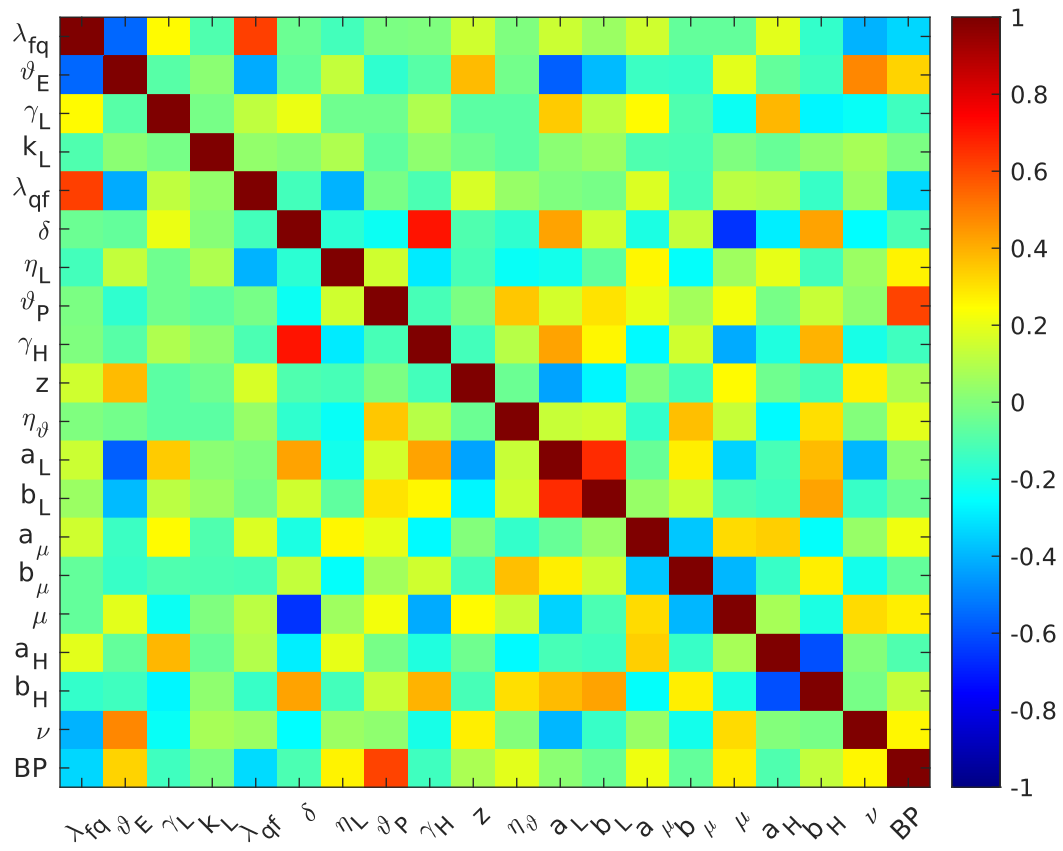
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

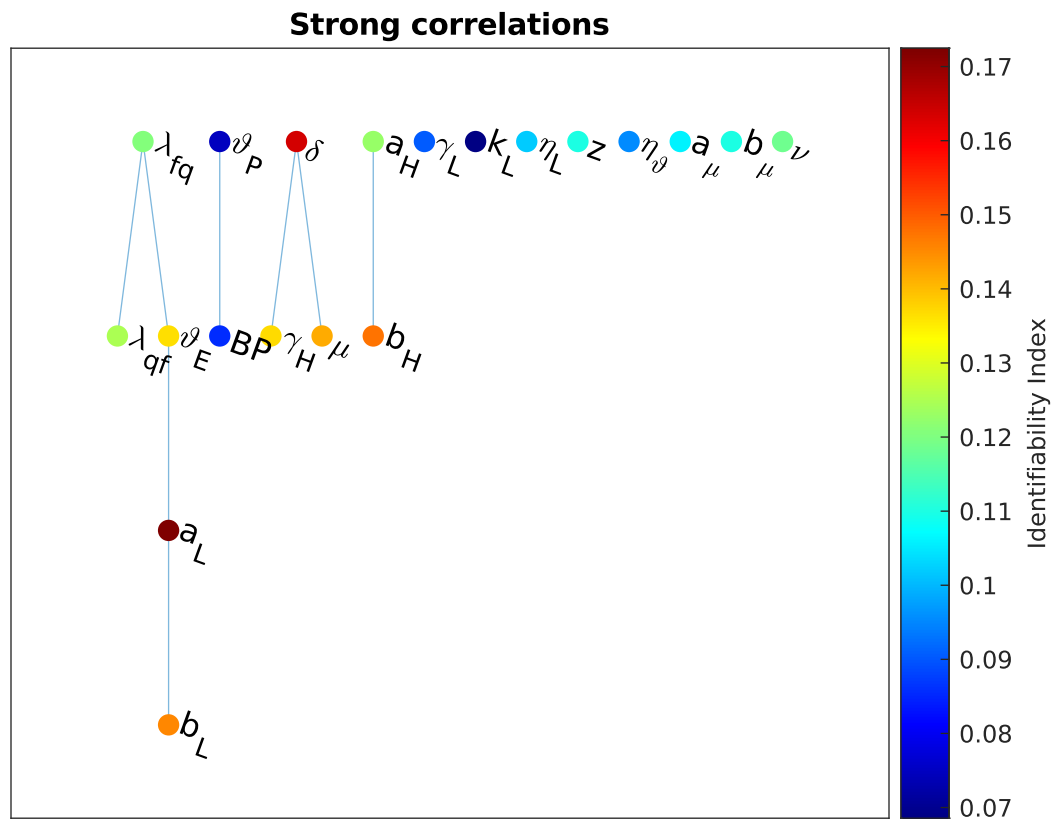
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0247'	'0.0392'	'0.0278'	'0.0257'	'0.1209'
$\vartheta_E$	'0.6657'	'0.7868'	'0.6133'	'0.7744'	'0.1365'
$\gamma_L$	'0.0778'	'0.1232'	'0.1275'	'0.0822'	'0.0907'
$k_L$	'4.7997'	'7.0133'	'5.4872'	'5.5445'	'0.0686'
$\lambda_{qf}$	'0.3479'	'0.3938'	'0.2669'	'0.3912'	'0.1248'
$\delta$	'0.098'	'0.15'	'0.0675'	'0.1497'	'0.1637'
$\eta_L$	'0.2424'	'0.292'	'0.3845'	'0.287'	'0.102'
$\vartheta_P$	'0'	'0'	'0.0038'	'0'	'0.0747'
$\gamma_H$	'0.7072'	'0.985'	'0.5495'	'0.9821'	'0.1368'
$z$	'26.6904'	'30'	'18.4694'	'29.68'	'0.1103'
$\eta_{\vartheta}$	'0.6863'	'0.9072'	'0.8943'	'0.9065'	'0.0957'
$a_L$	'1'	'1.4701'	'5.0335'	'1.006'	'0.1725'
$b_L$	'2.7999'	'5.8239'	'9.7937'	'3.4232'	'0.1454'
$a_{\mu}$	'2.3042'	'6.1062'	'4.3469'	'2.6898'	'0.1062'
$b_{\mu}$	'8.1883'	'13.8809'	'8.8794'	'13.25'	'0.1103'
$\mu$	'0.0495'	'0.1407'	'0.5186'	'0.0999'	'0.1418'
$a_H$	'4.4119'	'8.1834'	'7.9871'	'5.0794'	'0.1227'
$b_H$	'10.1878'	'15'	'7.771'	'14.6425'	'0.1474'
$\nu$	'314.8124'	'383.5288'	'224.7106'	'318.1346'	'0.1187'
BP	'316.5'	'368.9'	'323.5'	'322.5'	'0.0858'

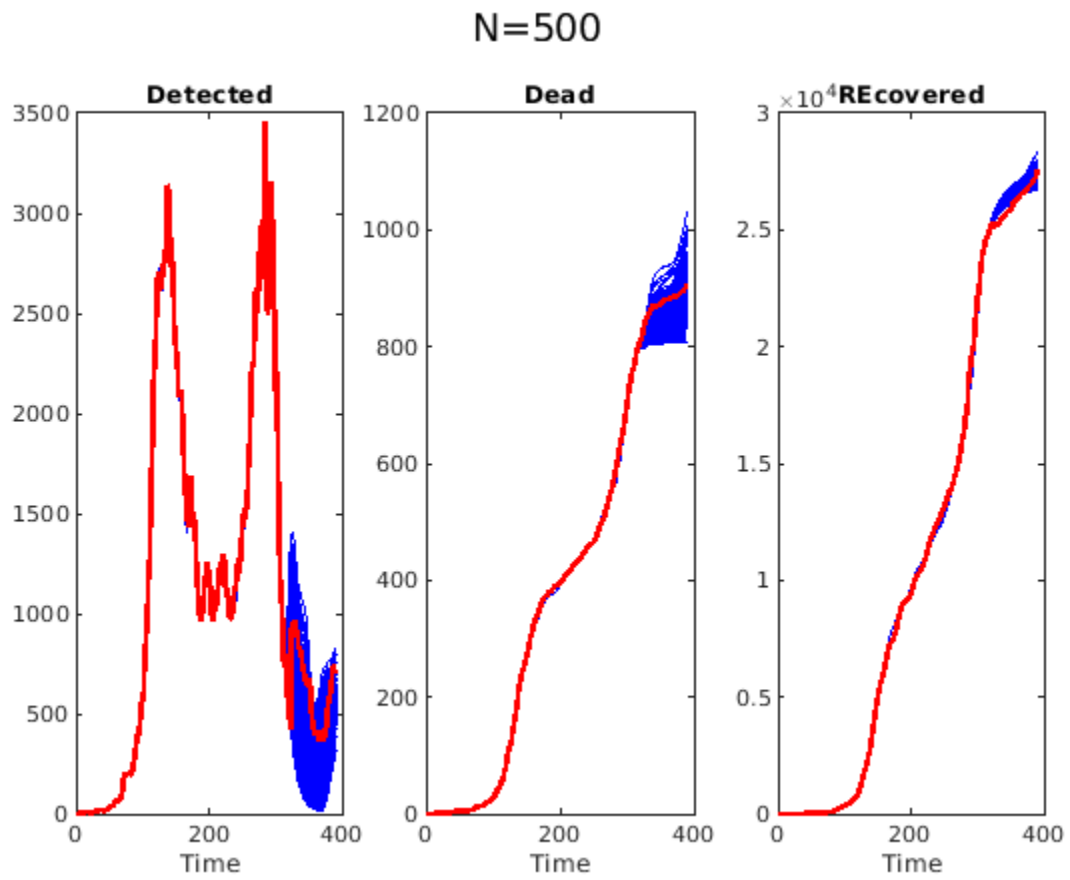
### 9.3. Identifiability analysis







## 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 data392 to the 422. The status of the validation is: COMPLETED.

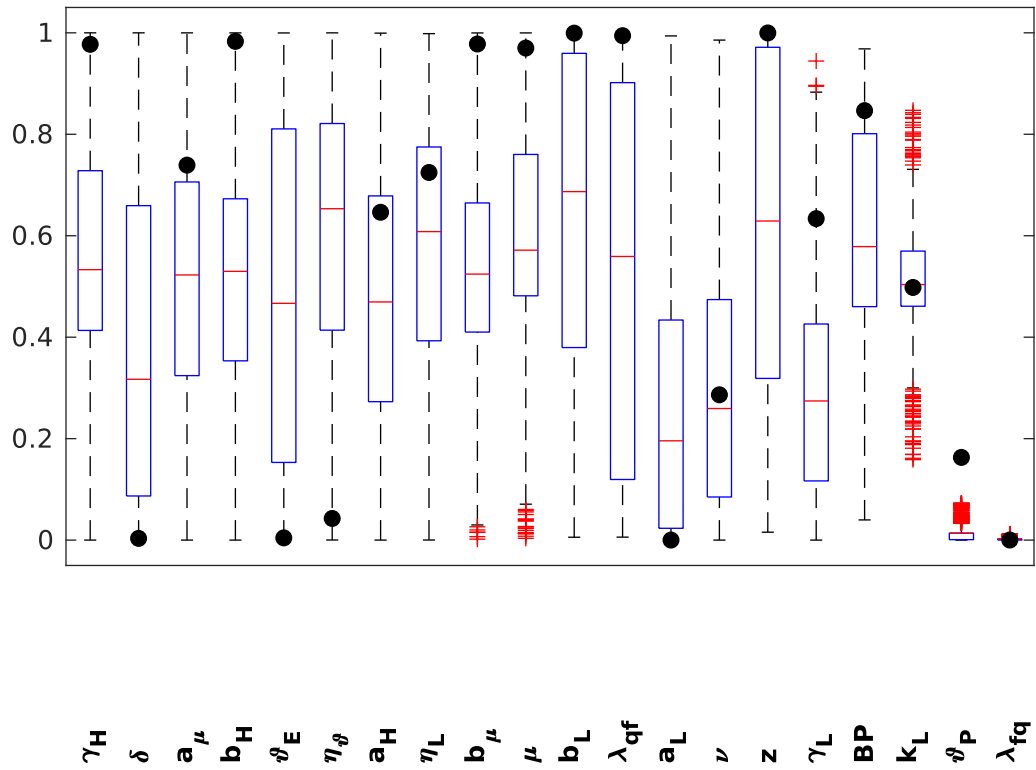
The number of estimations needed to perform the validation was1000.

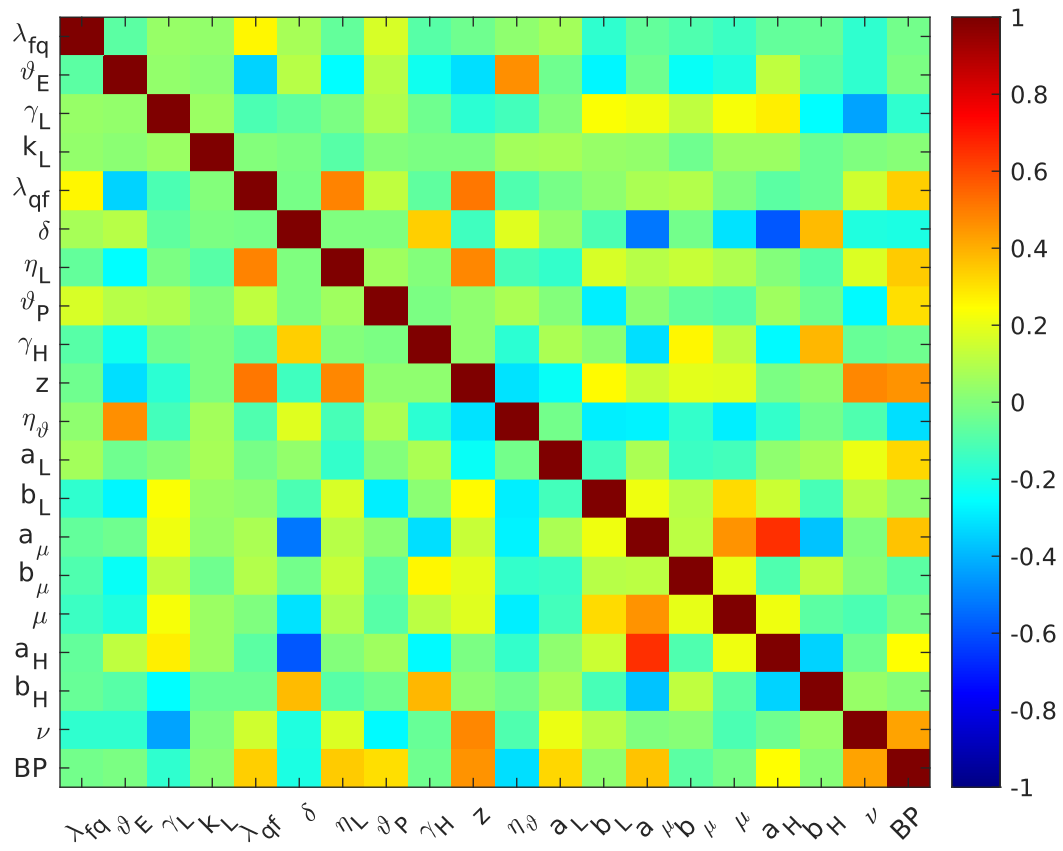
### 10.2. Estimated parameters with their intervals

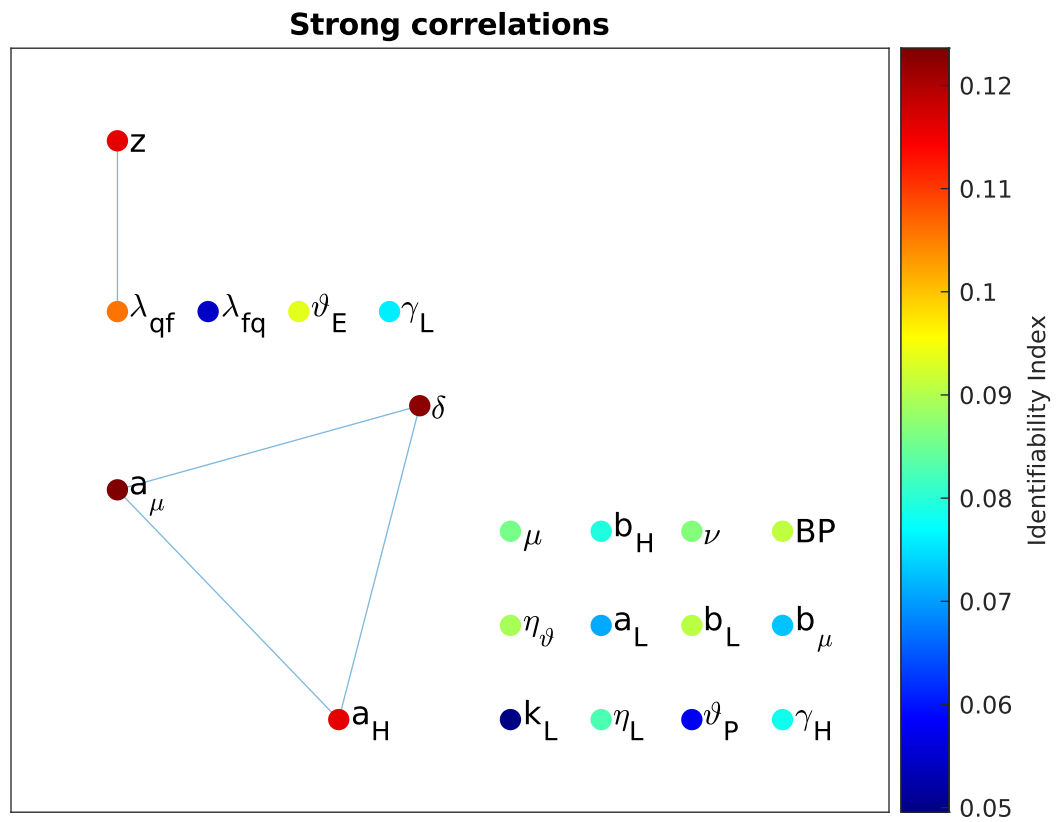
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0'	'0.0179'	'0.0022'	'0.0001'	'0.0547'
\vartheta_E	'0.4364'	'0.497'	'0.4667'	'0.0044'	'0.0938'
\gamma_L	'0.2565'	'0.292'	'0.2743'	'0.6337'	'0.0761'
k_L	'5.3851'	'5.6827'	'5.5339'	'5.4822'	'0.0496'
\lambda_{qf}	'0.5264'	'0.5919'	'0.5591'	'0.9943'	'0.1058'
\delta	'0.0429'	'0.0522'	'0.0476'	'0.0005'	'0.1225'
\eta_L	'0.5857'	'0.6305'	'0.6081'	'0.7247'	'0.0828'
\vartheta_P	'0.0032'	'0.0241'	'0.0136'	'0.163'	'0.0577'
\gamma_H	'0.5107'	'0.5555'	'0.5331'	'0.9774'	'0.0785'
z	'18.0108'	'19.7297'	'18.8702'	'29.9927'	'0.1159'
\eta_{\vartheta}	'0.6299'	'0.6766'	'0.6533'	'0.0426'	'0.0893'
a_L	'3.4159'	'4.0648'	'3.7404'	'1.0008'	'0.071'
b_L	'10.2219'	'11.0136'	'10.6178'	'14.9914'	'0.0908'
a_{\mu}	'7.9968'	'8.638'	'8.3174'	'11.3486'	'0.1236'
b_{\mu}	'8.0712'	'8.6114'	'8.3413'	'14.6917'	'0.0729'
\mu	'0.5506'	'0.5925'	'0.5715'	'0.97'	'0.0857'
a_H	'7.2428'	'7.9024'	'7.5726'	'10.0473'	'0.1161'
b_H	'8.1003'	'8.7333'	'8.4168'	'14.7643'	'0.0796'
\nu	'118.2647'	'141.1133'	'129.689'	'143.2186'	'0.0866'
BP	'373.1728'	'376.6548'	'374.9138'	'398.5'	'0.0911'

### 10.3. Identifiability analysis

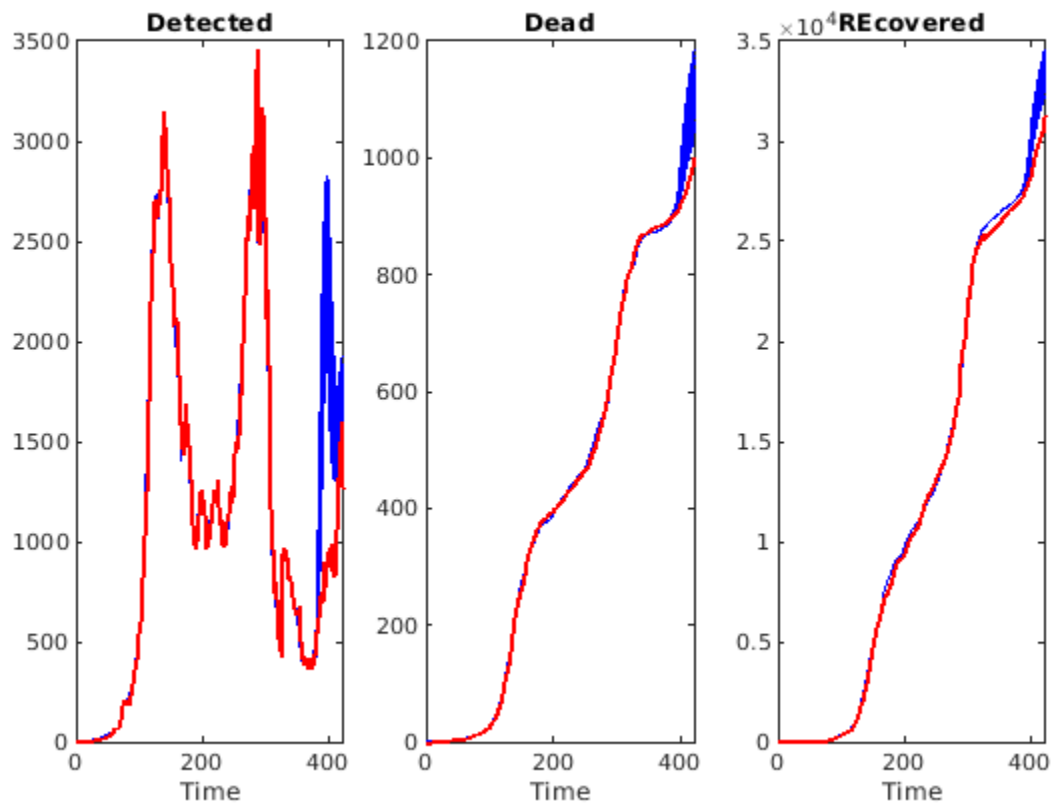






## 10.4. Uncertainty analysis

N=500



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## Chapter 11. Extension number11

### 11.1. 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.

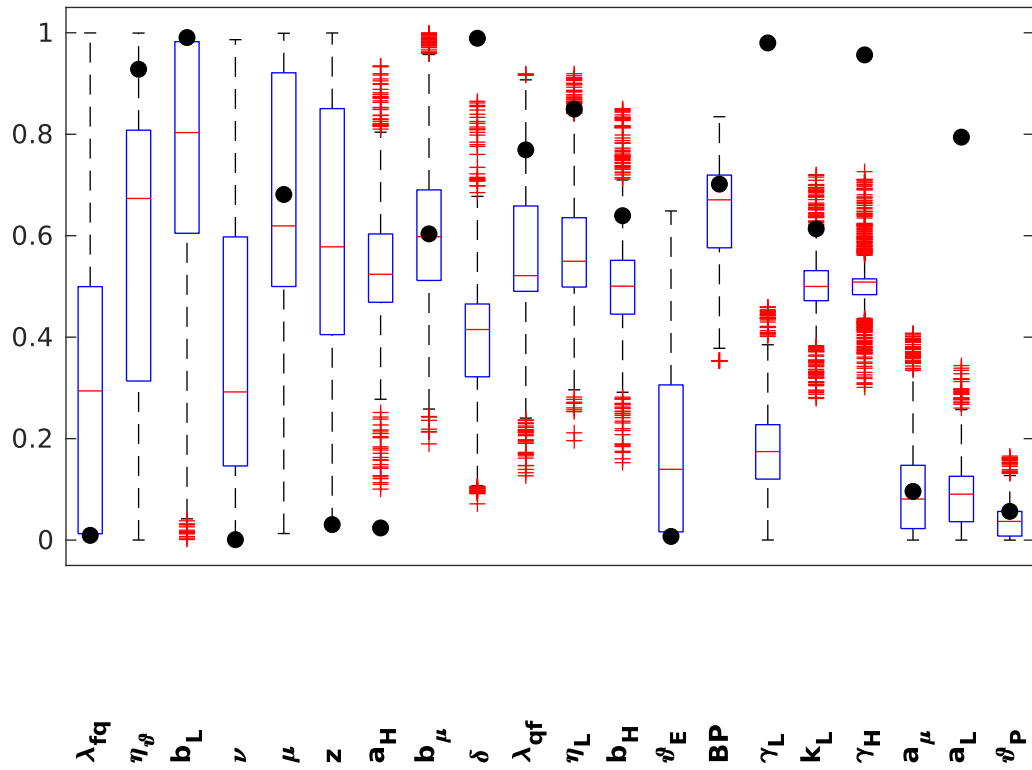
### 11.2. Estimated parameters with their intervals

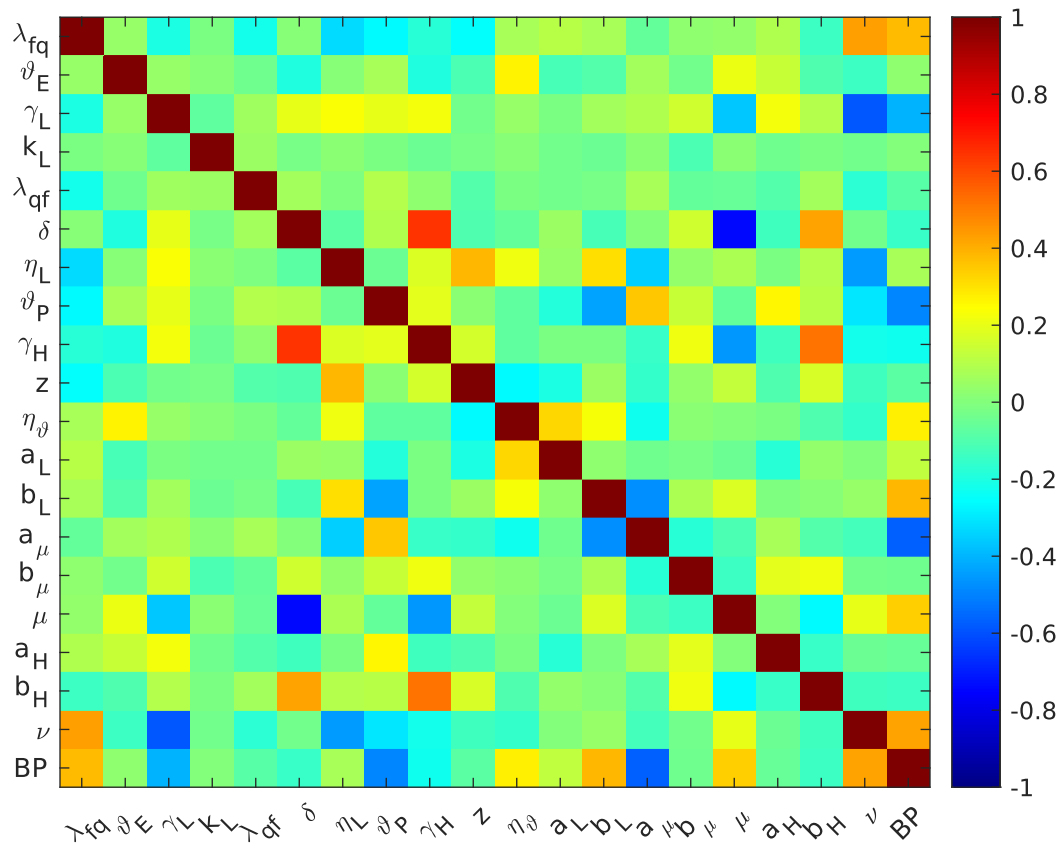
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

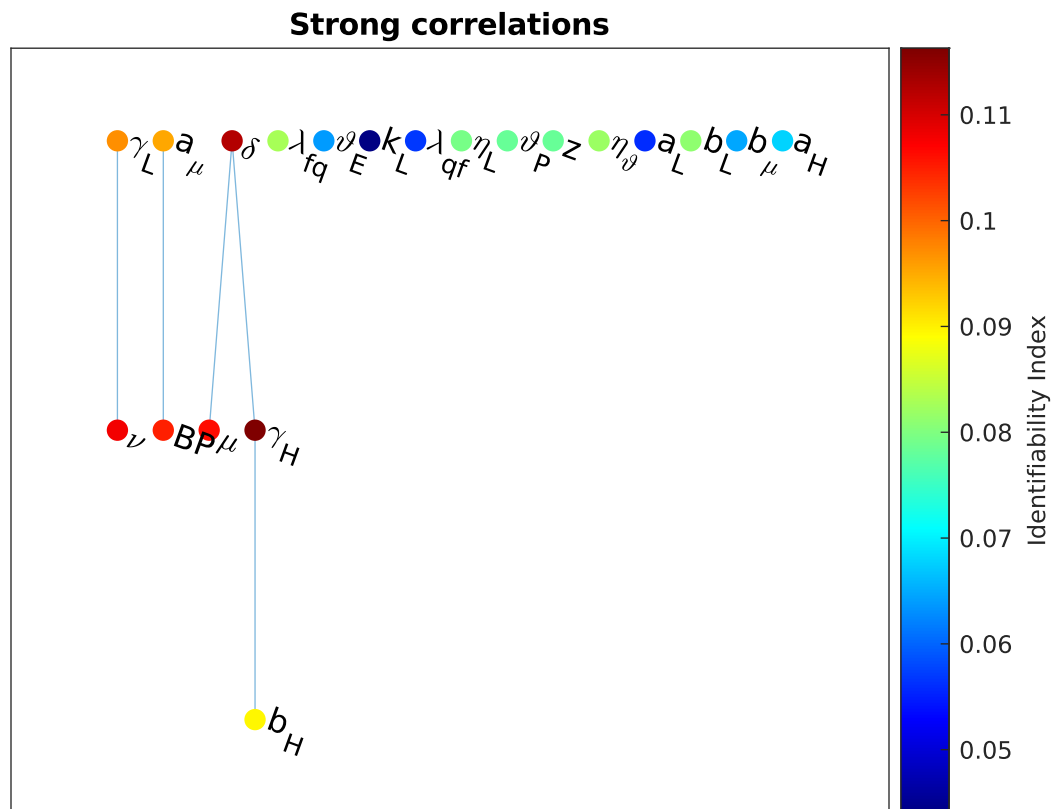
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.021'	'0.2941'	'0.0093'	'0.0829'
$\vartheta_E$	'0'	'0.0162'	'0.1407'	'0.0072'	'0.0639'
$\gamma_L$	'0.3471'	'1'	'0.1746'	'0.98'	'0.0969'
$k_L$	'1.5293'	'10'	'5.4998'	'6.5219'	'0.0441'
$\lambda_{qf}$	'0'	'0.96'	'0.5213'	'0.7692'	'0.0568'
$\delta$	'0'	'0.15'	'0.0623'	'0.1484'	'0.1124'
$\eta_L$	'0.0821'	'0.869'	'0.5496'	'0.8496'	'0.0796'
$\vartheta_P$	'0.0316'	'0.0653'	'0.0368'	'0.0567'	'0.0784'
$\gamma_H$	'0.025'	'1'	'0.5086'	'0.9564'	'0.1163'
$z$	'0.2783'	'1.0829'	'17.3421'	'0.9164'	'0.0783'
$\eta_{\vartheta}$	'0.7288'	'0.9469'	'0.6735'	'0.9281'	'0.0819'
$a_L$	'9.2081'	'12.3745'	'2.2686'	'12.1199'	'0.056'
$b_L$	'10.1293'	'15'	'12.2467'	'14.8684'	'0.0813'
$a_{\mu}$	'1'	'15'	'2.1357'	'2.3437'	'0.0954'
$b_{\mu}$	'1.266'	'14.3'	'9.3712'	'9.4512'	'0.0648'
$\mu$	'0.02'	'1'	'0.6193'	'0.6813'	'0.1062'
$a_H$	'1'	'14.3'	'8.3359'	'1.3355'	'0.068'
$b_H$	'1.35'	'15'	'8.0078'	'9.9521'	'0.0896'
$\nu$	'0'	'1.0044'	'146.0253'	'0.4464'	'0.108'
BP	'420.7232'	'427.3928'	'419.4999'	'420.7685'	'0.1049'

### 11.3. Identifiability analysis



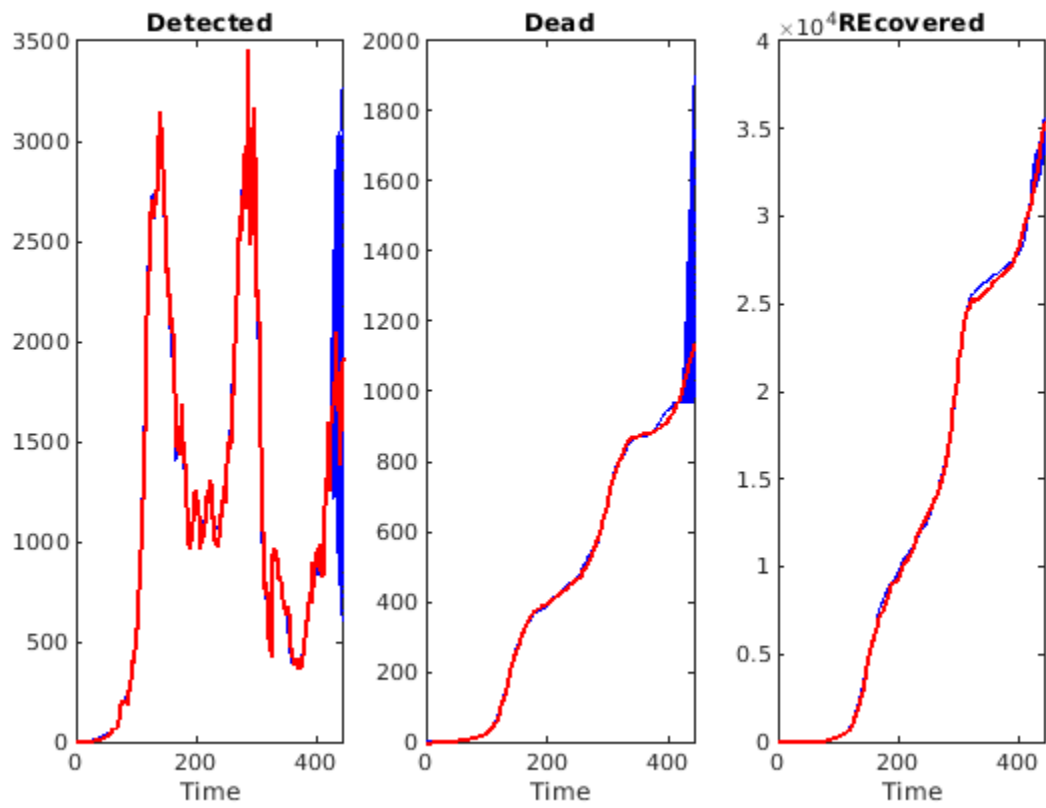






## 11.4. Uncertainty analysys

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 data443 to the 471. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

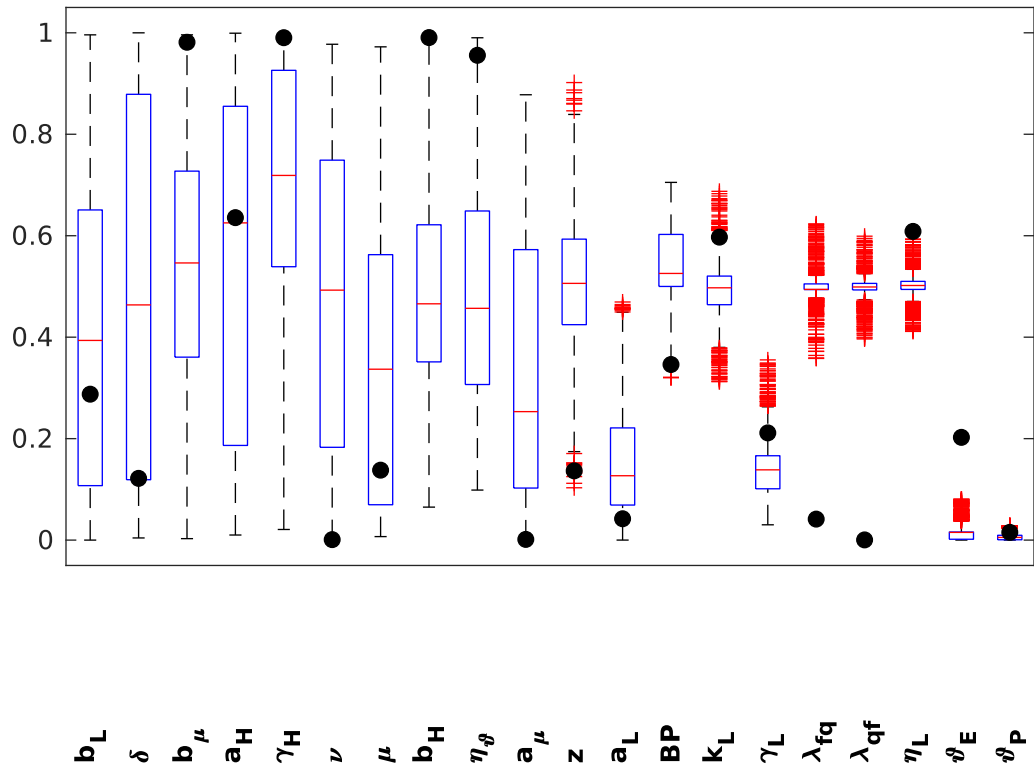
### 12.2. Estimated parameters with their intervals

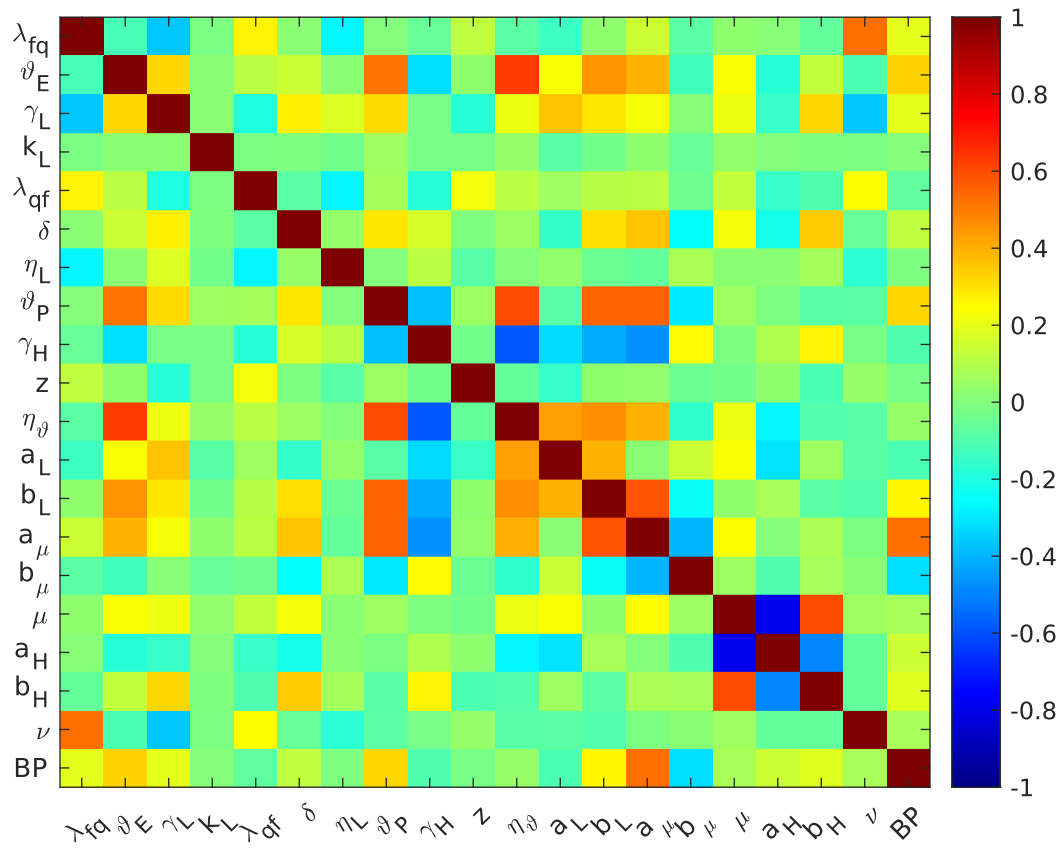
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

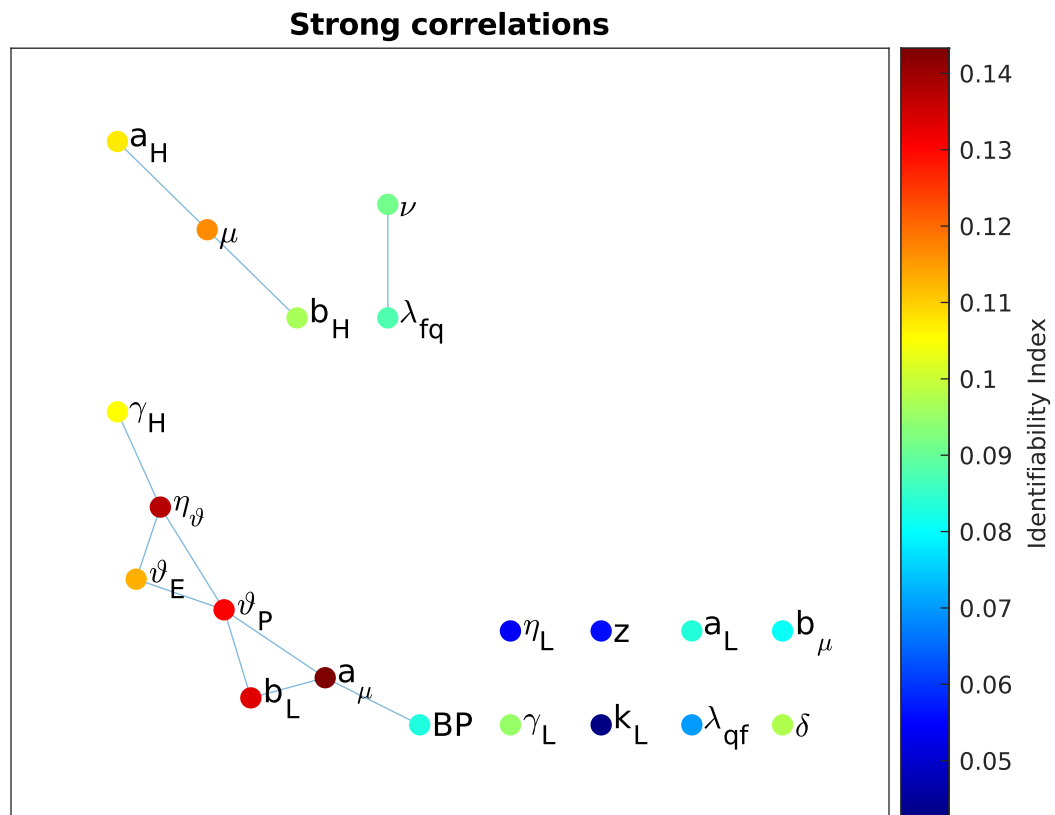
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0402'	'0.0602'	'0.4942'	'0.0414'	'0.0878'
$\vartheta_E$	'0.152'	'0.3181'	'0.0152'	'0.2025'	'0.1131'
$\gamma_L$	'0.2099'	'0.274'	'0.1385'	'0.2113'	'0.0952'
$k_L$	'1.1642'	'9.208'	'5.4759'	'6.3746'	'0.0425'
$\lambda_{qf}$	'0'	'0.0008'	'0.499'	'0.0004'	'0.0703'
$\delta$	'0'	'0.0411'	'0.0695'	'0.0183'	'0.0973'
$\eta_L$	'0.4321'	'0.909'	'0.5019'	'0.6085'	'0.054'
$\vartheta_P$	'0.0043'	'0.0276'	'0.0053'	'0.0153'	'0.131'
$\gamma_H$	'0'	'1'	'0.7188'	'0.9903'	'0.1053'
$z$	'3.0786'	'4.1647'	'15.1817'	'4.0951'	'0.0561'
$\eta_{\vartheta}$	'0.4744'	'0.9709'	'0.4569'	'0.9557'	'0.1375'
$a_L$	'1.3609'	'2.2206'	'2.7821'	'1.5892'	'0.0837'
$b_L$	'3.4251'	'7.5418'	'6.5103'	'5.0268'	'0.1336'
$a_{\mu}$	'1'	'11.206'	'4.5455'	'1.0194'	'0.1433'
$b_{\mu}$	'2.4'	'15'	'8.6486'	'14.7389'	'0.0809'
$\mu$	'0'	'0.2688'	'0.3369'	'0.1379'	'0.1168'
$a_H$	'1'	'14.44'	'9.7542'	'9.8988'	'0.1073'
$b_H$	'1'	'15'	'7.5209'	'14.8684'	'0.0966'
$\nu$	'0'	'1.0464'	'246.3631'	'0.4651'	'0.0915'
BP	'435.3741'	'440.0647'	'442.5'	'435.4999'	'0.0831'

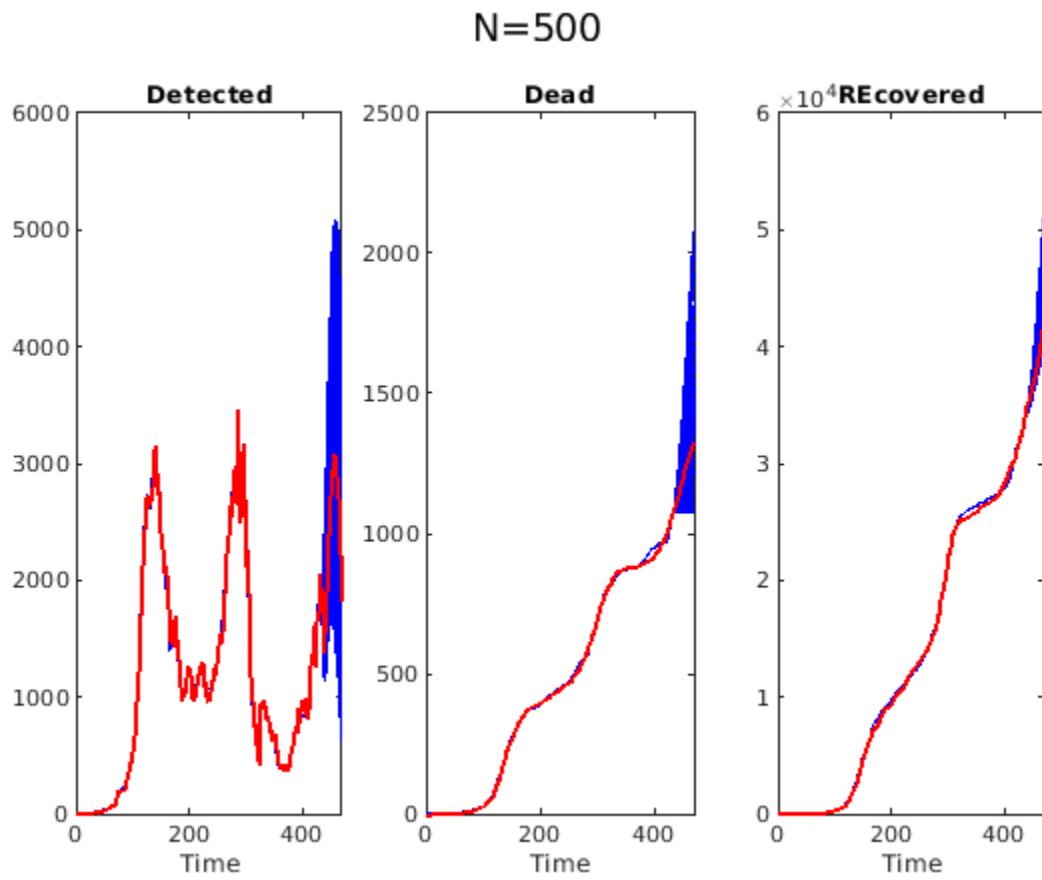
### 12.3. Identifiability analysis







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

The number of estimations needed to perform the validation was1000.

### 13.2. Estimated parameters with their intervals

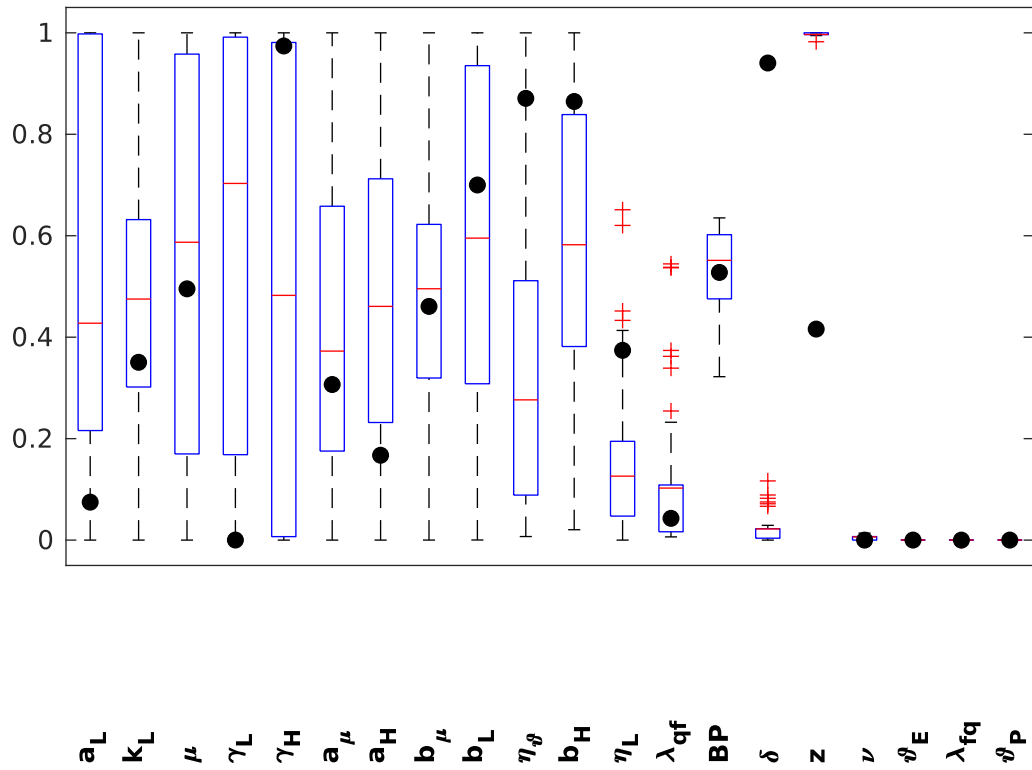
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

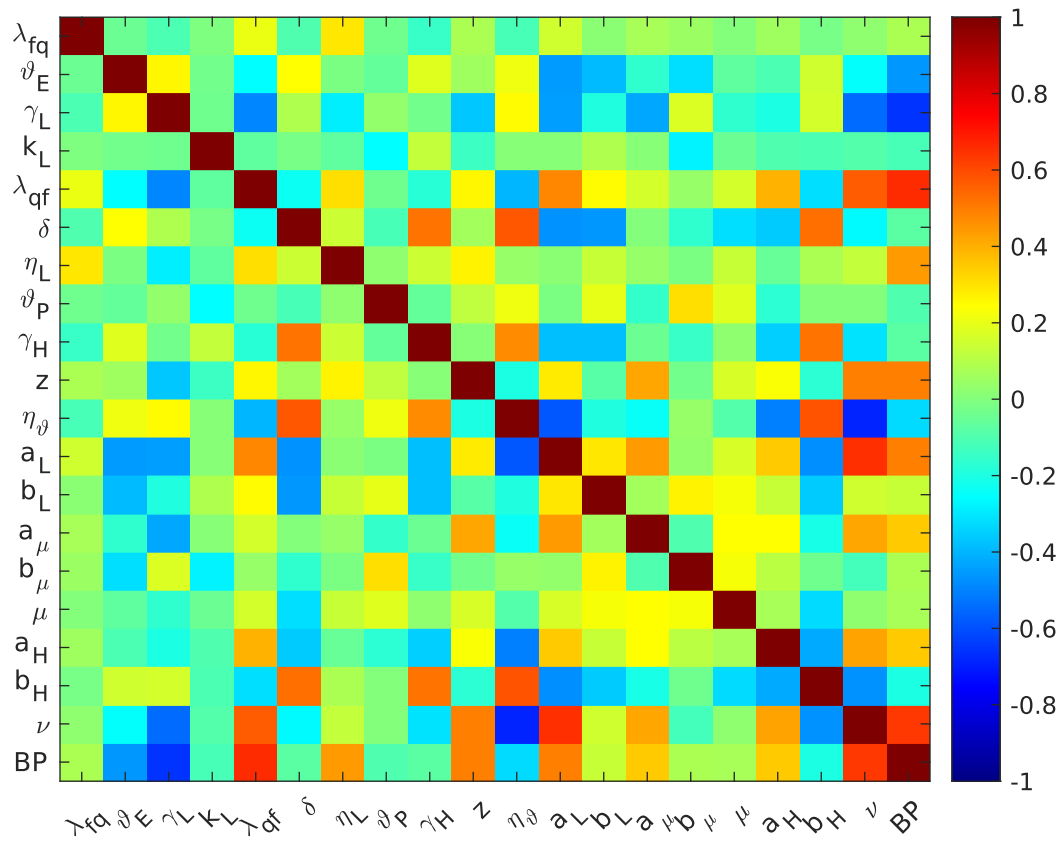
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

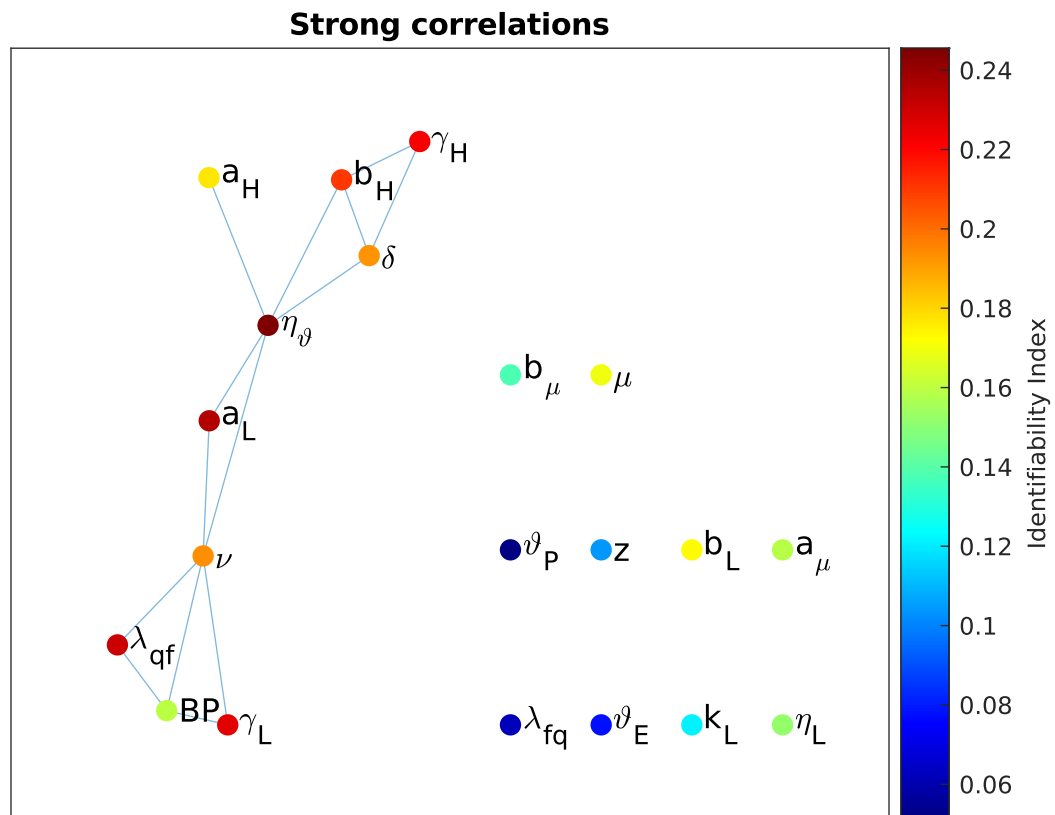
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0'	'0'	'0'	'0.0623'
$\vartheta_E$	'0'	'0.0001'	'0'	'0.0001'	'0.0783'
$\gamma_L$	'0'	'0.0001'	'0.7031'	'0.0001'	'0.2263'
$k_L$	'2.9822'	'6.7288'	'5.2767'	'4.1544'	'0.1213'
$\lambda_{qf}$	'0.0336'	'0.0483'	'0.1087'	'0.0429'	'0.2308'
$\delta$	'0.1203'	'0.1435'	'0.0034'	'0.1411'	'0.1928'
$\eta_L$	'0.3228'	'0.4333'	'0.128'	'0.3741'	'0.1518'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0515'
$\gamma_H$	'0.7954'	'0.9813'	'0.4824'	'0.974'	'0.2226'
$z$	'11.4598'	'12.4949'	'29.8939'	'12.4799'	'0.1042'
$\eta_{\vartheta}$	'0.8118'	'0.8776'	'0.2765'	'0.8708'	'0.2455'
$a_L$	'1.8392'	'4.0033'	'6.9862'	'2.0471'	'0.2354'
$b_L$	'4.5596'	'11.178'	'9.3342'	'10.8007'	'0.1733'
$a_{\mu}$	'5.201'	'7.1178'	'6.2162'	'5.2941'	'0.1586'
$b_{\mu}$	'3.9433'	'7.6682'	'7.9366'	'7.4496'	'0.1381'
$\mu$	'0.2625'	'0.5482'	'0.5872'	'0.4953'	'0.169'
$a_H$	'2.6949'	'3.4153'	'7.4506'	'3.3418'	'0.1773'
$b_H$	'10.4241'	'13.1097'	'9.1516'	'13.1048'	'0.2106'
$\nu$	'0.0007'	'0.0011'	'3.4939'	'0.0007'	'0.1939'
BP	'572.5'	'696'	'582.5152'	'576.5'	'0.1595'



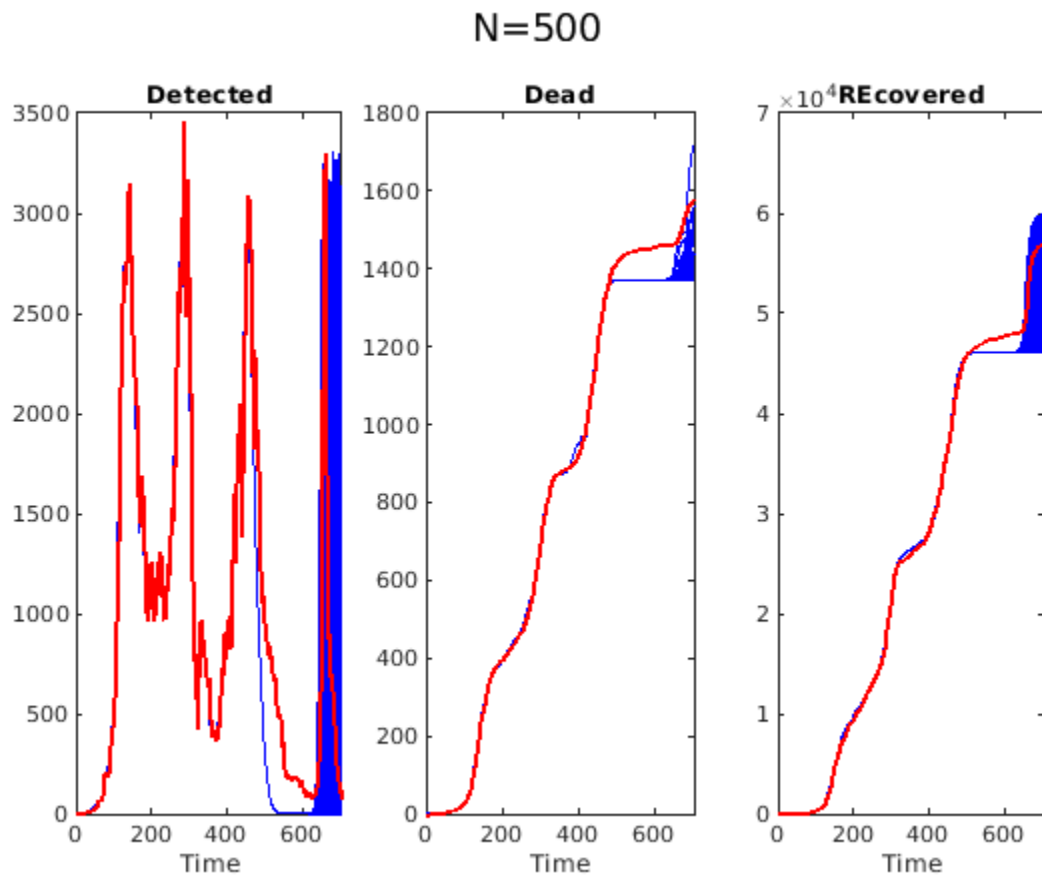
### 13.3. Identifiability analysis







### 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 data706 to the 722. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

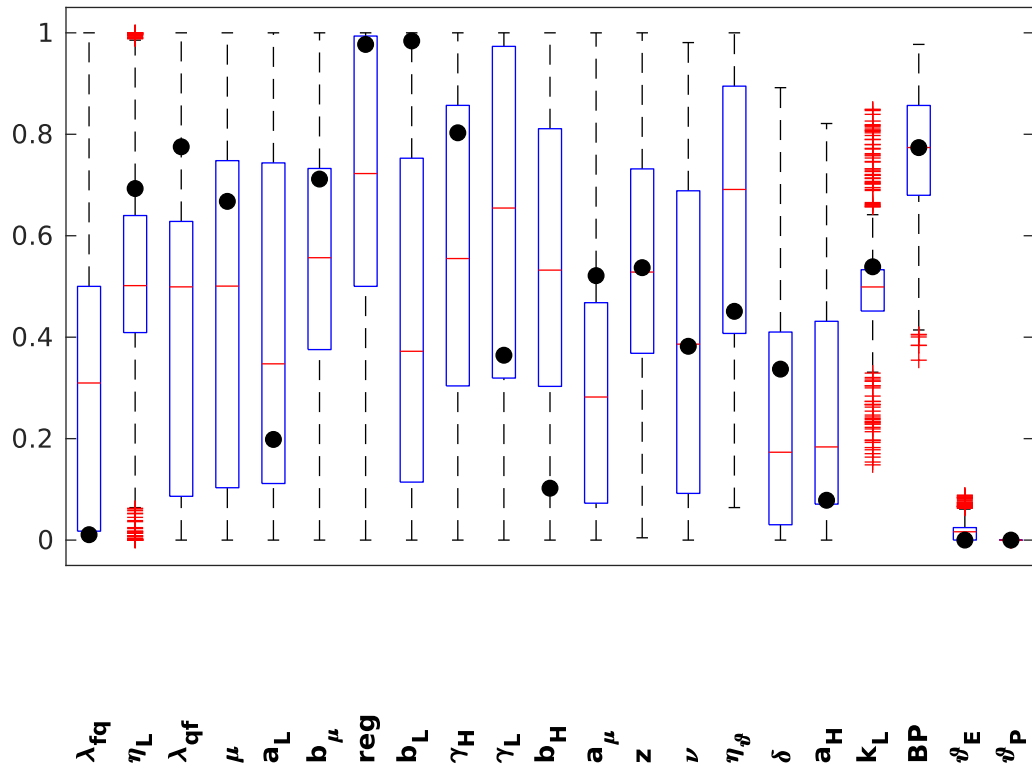
### 14.2. Estimated parameters with their intervals

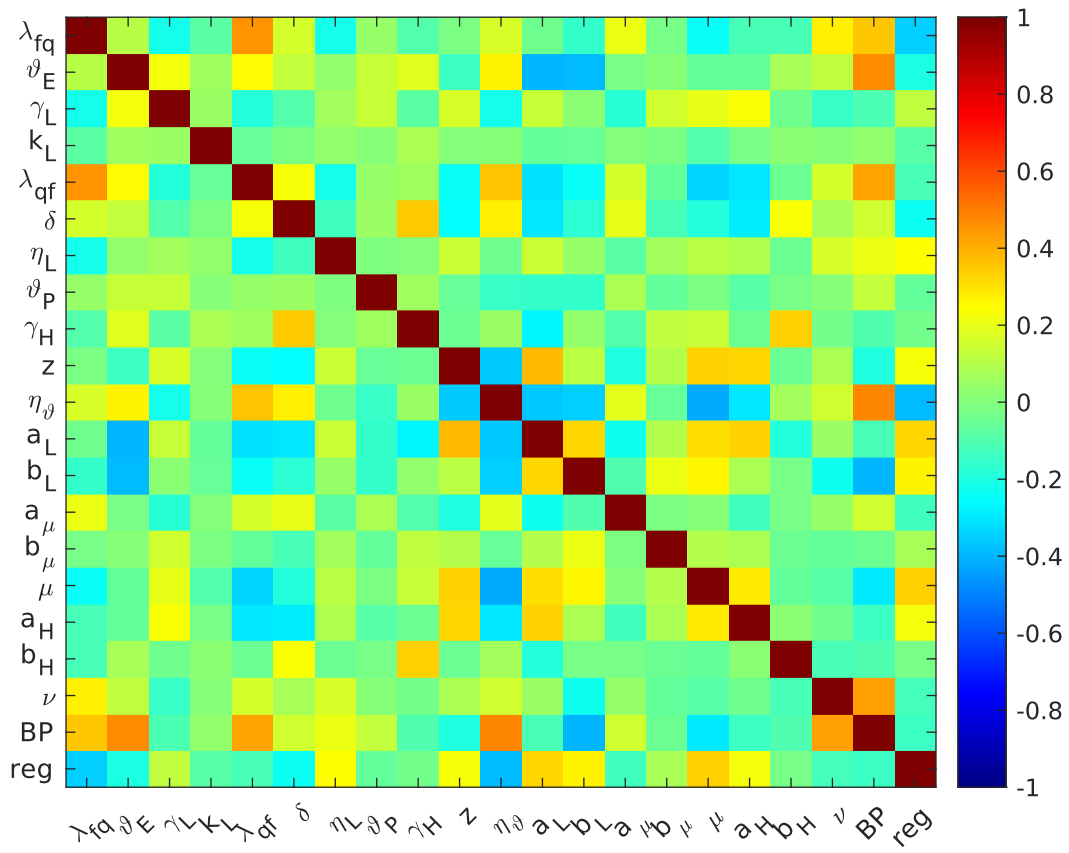
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

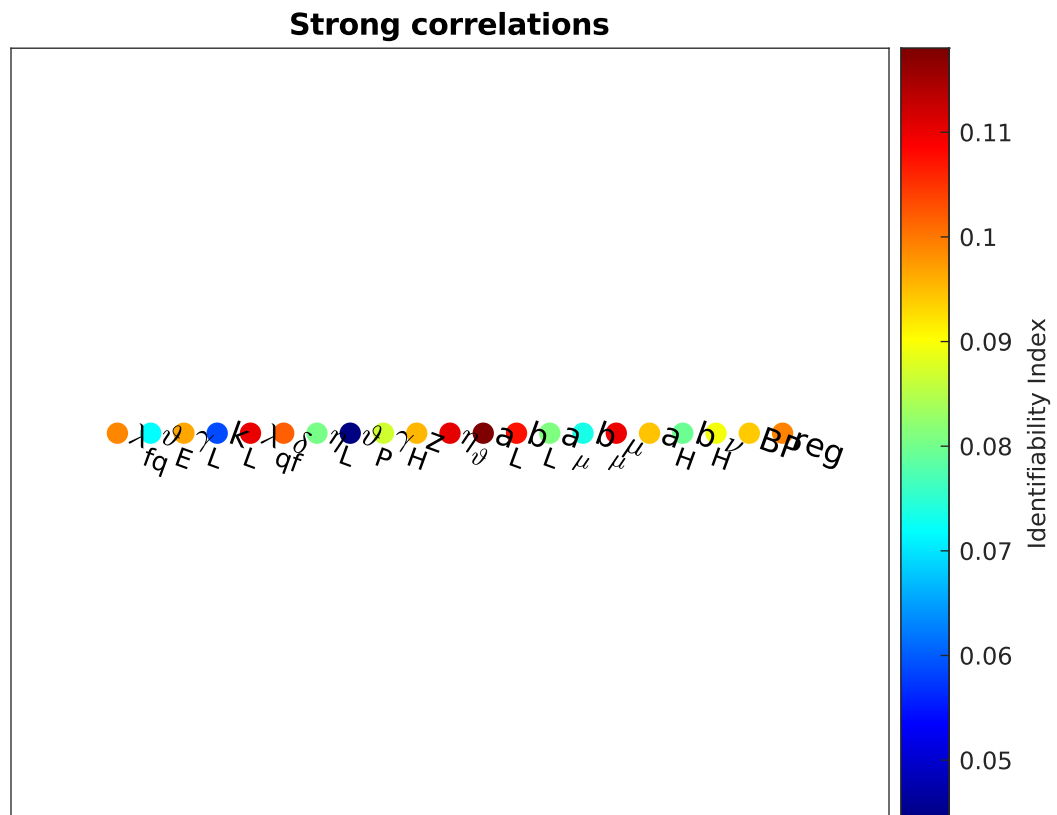
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0176'	'0.3097'	'0.0107'	'0.099'
$\vartheta_E$	'0'	'0.0001'	'0.0165'	'0.0001'	'0.0719'
$\gamma_L$	'0.3494'	'0.8481'	'0.6546'	'0.3644'	'0.0967'
$k_L$	'1.324'	'9.1'	'5.4913'	'5.8492'	'0.0589'
$\lambda_{qf}$	'0.2249'	'1'	'0.4992'	'0.7754'	'0.1101'
$\delta$	'0.049'	'0.0642'	'0.026'	'0.0506'	'0.1017'
$\eta_L$	'0.3885'	'1'	'0.5016'	'0.693'	'0.0805'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0445'
$\gamma_H$	'0.4857'	'0.814'	'0.555'	'0.8029'	'0.0868'
$z$	'13.4021'	'27.5059'	'15.8522'	'16.1117'	'0.0954'
$\eta_{\vartheta}$	'0.441'	'0.5035'	'0.6912'	'0.451'	'0.1105'
$a_L$	'2.086'	'6.4224'	'5.8647'	'3.7781'	'0.118'
$b_L$	'7.5352'	'15'	'6.2111'	'14.7767'	'0.1077'
$a_{\mu}$	'6.7768'	'14.1075'	'4.949'	'8.2985'	'0.081'
$b_{\mu}$	'1'	'13.635'	'8.7935'	'10.964'	'0.0736'
$\mu$	'0.0214'	'0.855'	'0.5007'	'0.6678'	'0.1099'
$a_H$	'1.8956'	'2.3639'	'3.5736'	'2.0994'	'0.0947'
$b_H$	'2.1579'	'5.486'	'8.4509'	'2.4326'	'0.0796'
$\nu$	'152.6389'	'195.3099'	'193.1458'	'191.0257'	'0.0894'
BP	'652.6873'	'658.1214'	'657.5'	'657.4707'	'0.0939'
reg	'0.222'	'0.2472'	'0.1806'	'0.2443'	'0.0992'

### 14.3. Identifiability analysis









## 14.4. Uncertainty analysis

N=500

