

# **Validation process for RISARALDA**

**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

<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

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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 125. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

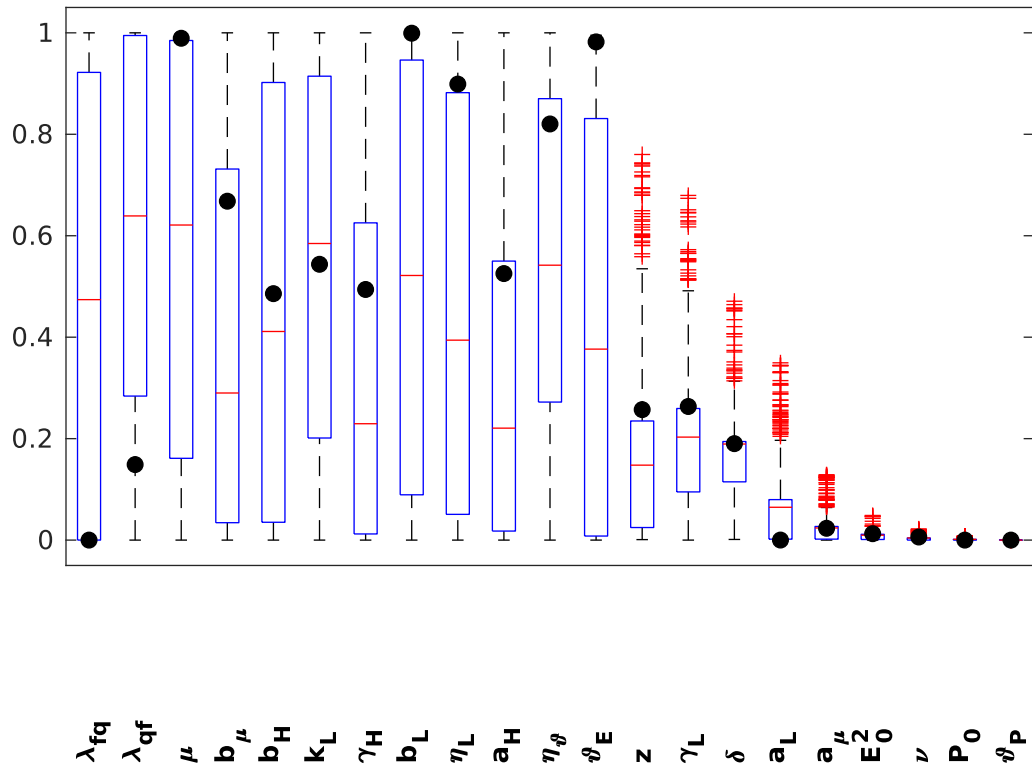
### 1.2. Estimated parameters with their intervals

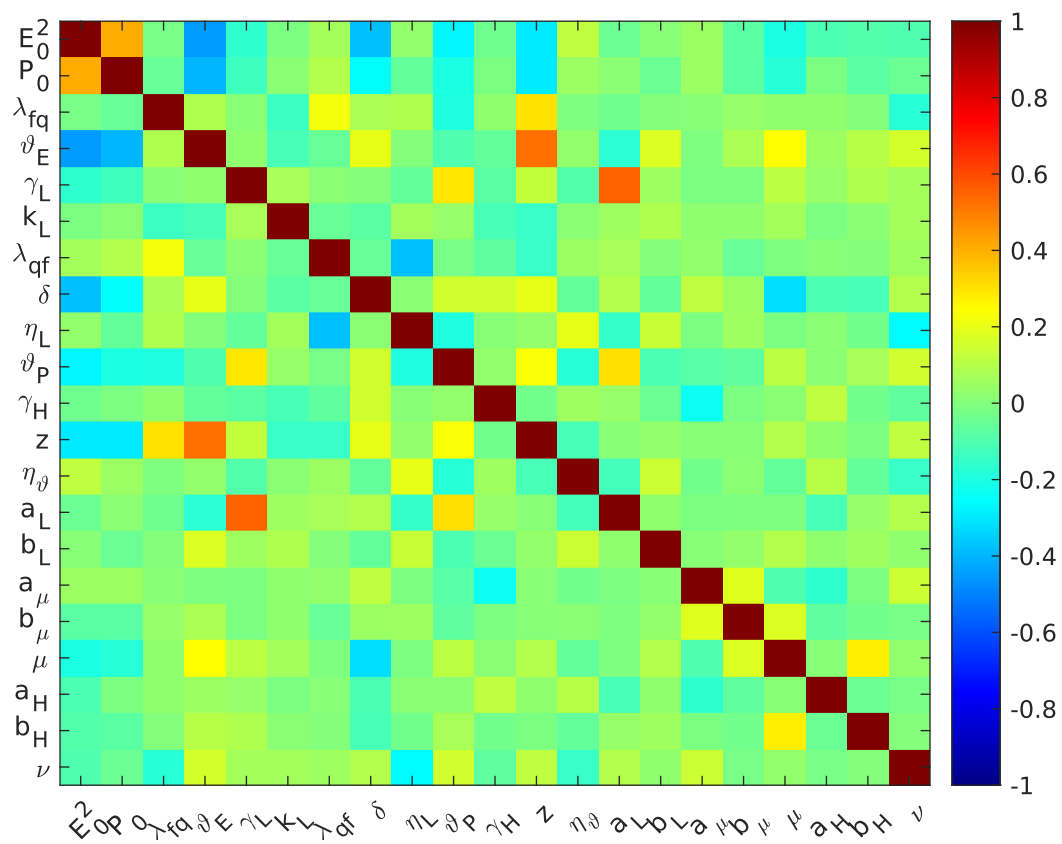
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

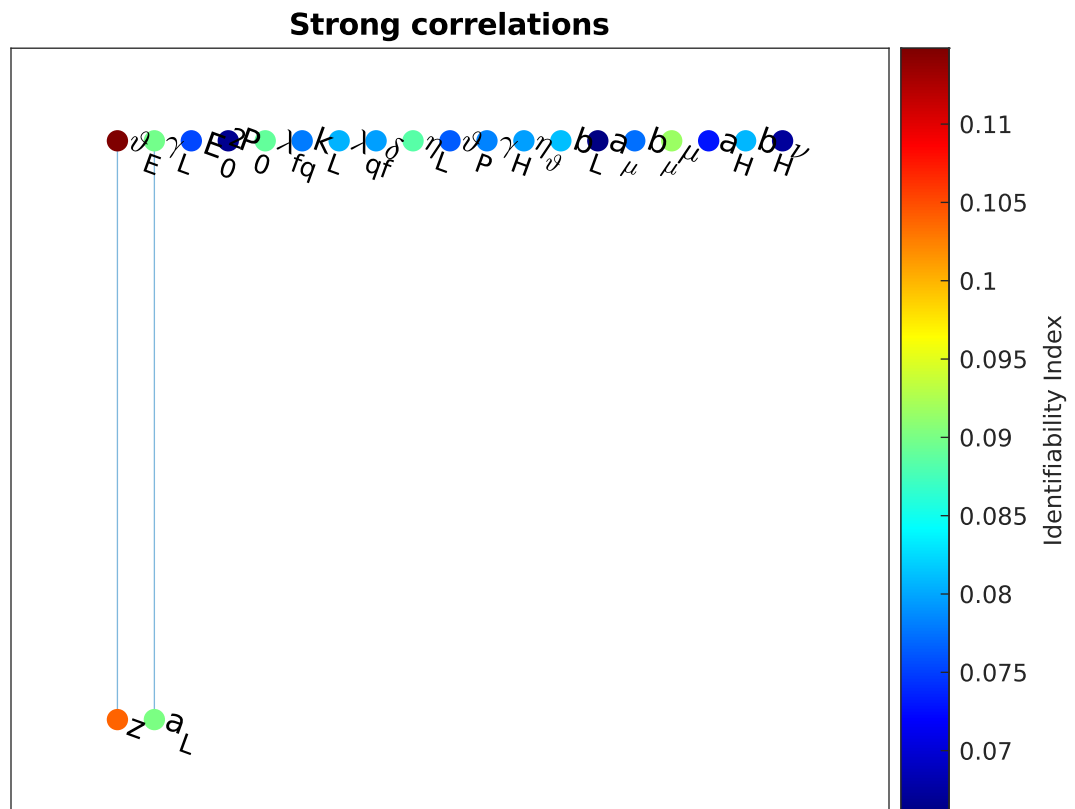
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$E^2_0$	'23.1673'	'29.0757'	'19.3564'	'25.2584'	'0.0756'
$P_0$	'0'	'0'	'0.5907'	'0'	'0.0668'
$\lambda_{fq}$	'0'	'0'	'0.474'	'0'	'0.089'
$\vartheta_E$	'0.9809'	'0.9822'	'0.3765'	'0.9821'	'0.1148'
$\gamma_L$	'0.2431'	'0.2637'	'0.203'	'0.2634'	'0.0898'
$k_L$	'1.225'	'10'	'6.2622'	'5.8934'	'0.0779'
$\lambda_{qf}$	'0.0084'	'0.335'	'0.639'	'0.1489'	'0.0806'
$\delta$	'0.0262'	'0.0352'	'0.0284'	'0.0285'	'0.0796'
$\eta_L$	'0.4662'	'1'	'0.3941'	'0.8989'	'0.0884'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0764'
$\gamma_H$	'0.025'	'1'	'0.2294'	'0.4941'	'0.0784'
$z$	'7.3765'	'7.8891'	'4.4324'	'7.7158'	'0.1039'
$\eta_{\vartheta}$	'0.4047'	'0.9406'	'0.5419'	'0.8203'	'0.0797'
$a_L$	'1'	'1.0888'	'1.9061'	'1.0012'	'0.0901'
$b_L$	'13.3277'	'15'	'8.3031'	'14.9897'	'0.0812'
$a_{\mu}$	'1'	'4.4997'	'1.3349'	'1.326'	'0.0661'
$b_{\mu}$	'4.6579'	'15'	'5.0598'	'10.353'	'0.0775'
$\mu$	'0.2785'	'1'	'0.6211'	'0.9893'	'0.0917'
$a_H$	'6.8801'	'15'	'4.0897'	'8.3558'	'0.073'
$b_H$	'1'	'15'	'6.7575'	'7.8016'	'0.0808'
$\nu$	'0'	'6.8418'	'2.0988'	'3.0408'	'0.0672'

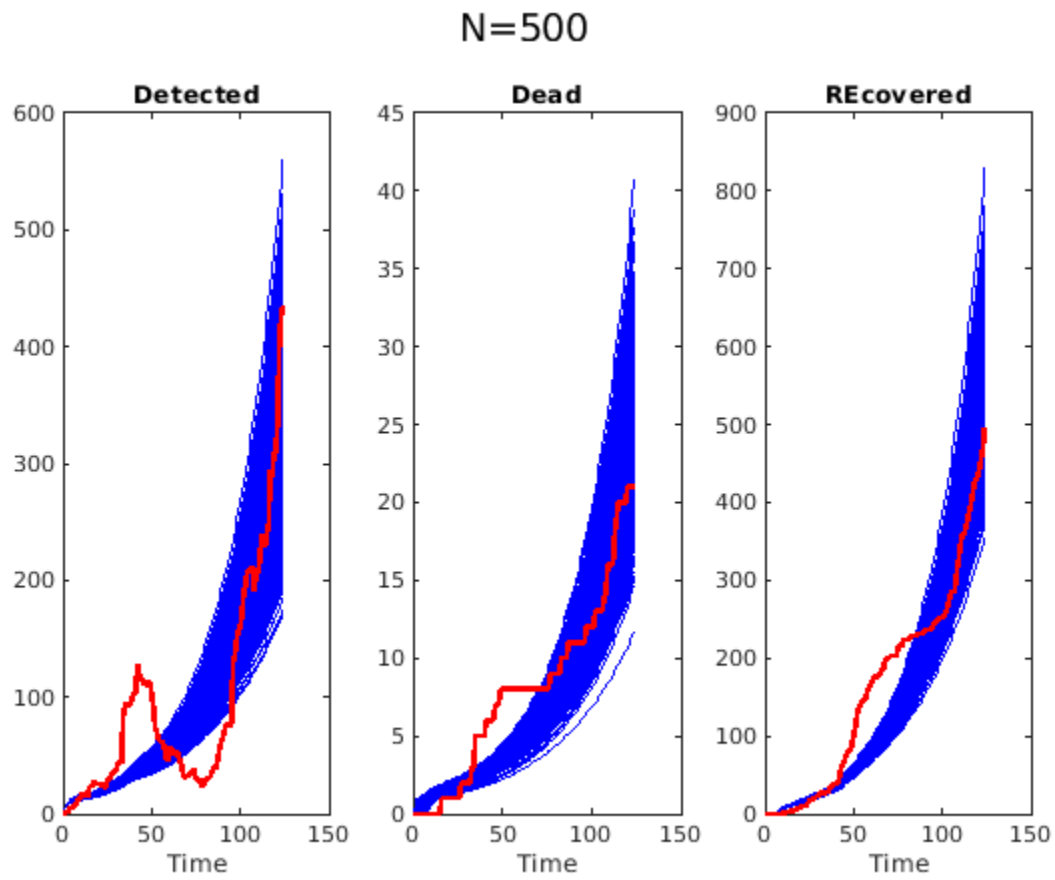
### 1.3. Identifiability analysis







## 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 data125 to the 166. The status of the validation is: COMPLETED.

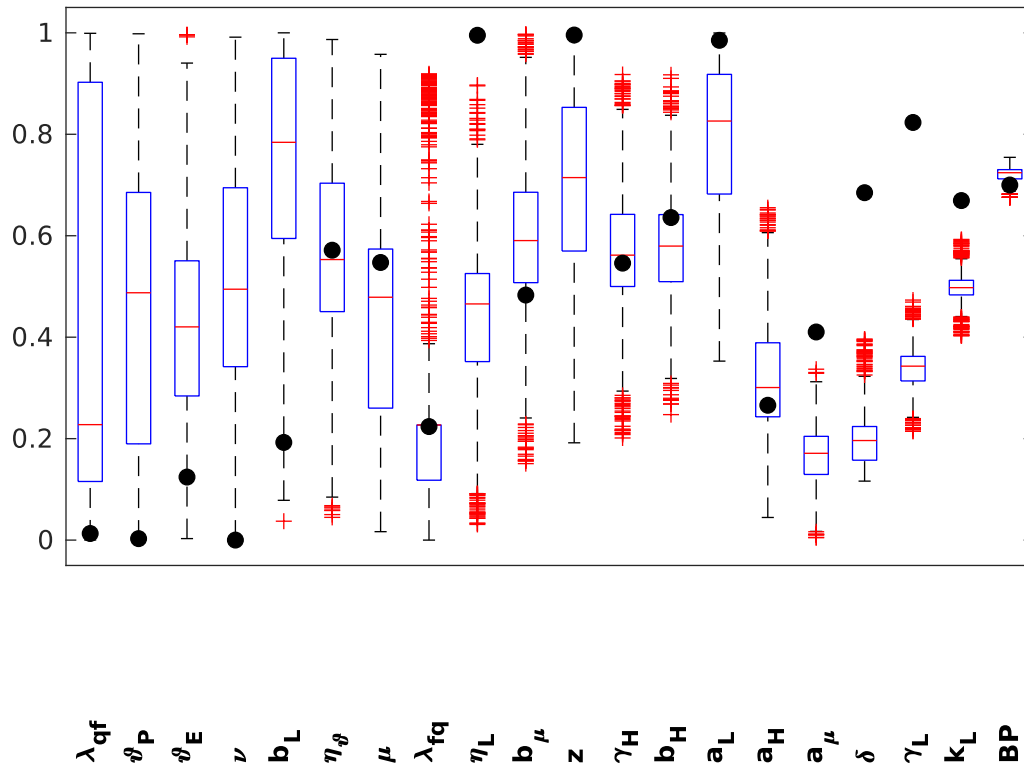
The number of estimations needed to perform the validation was1000.

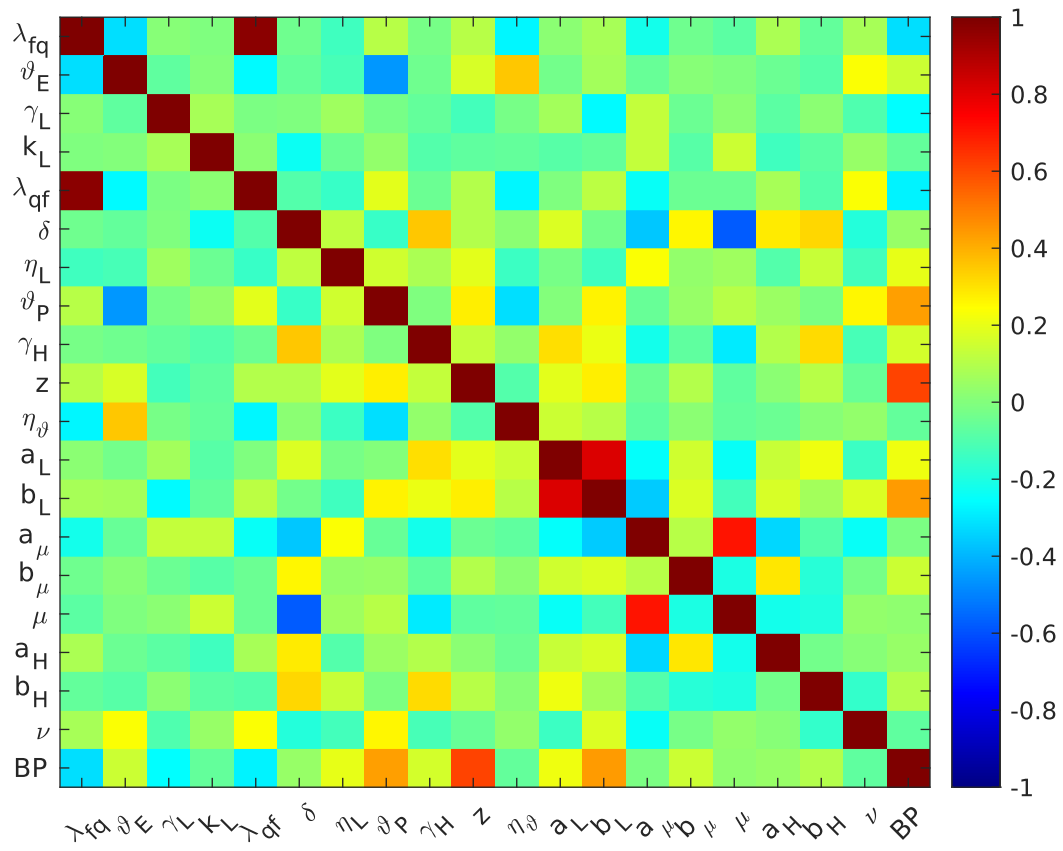
### 2.2. Estimated parameters with their intervals

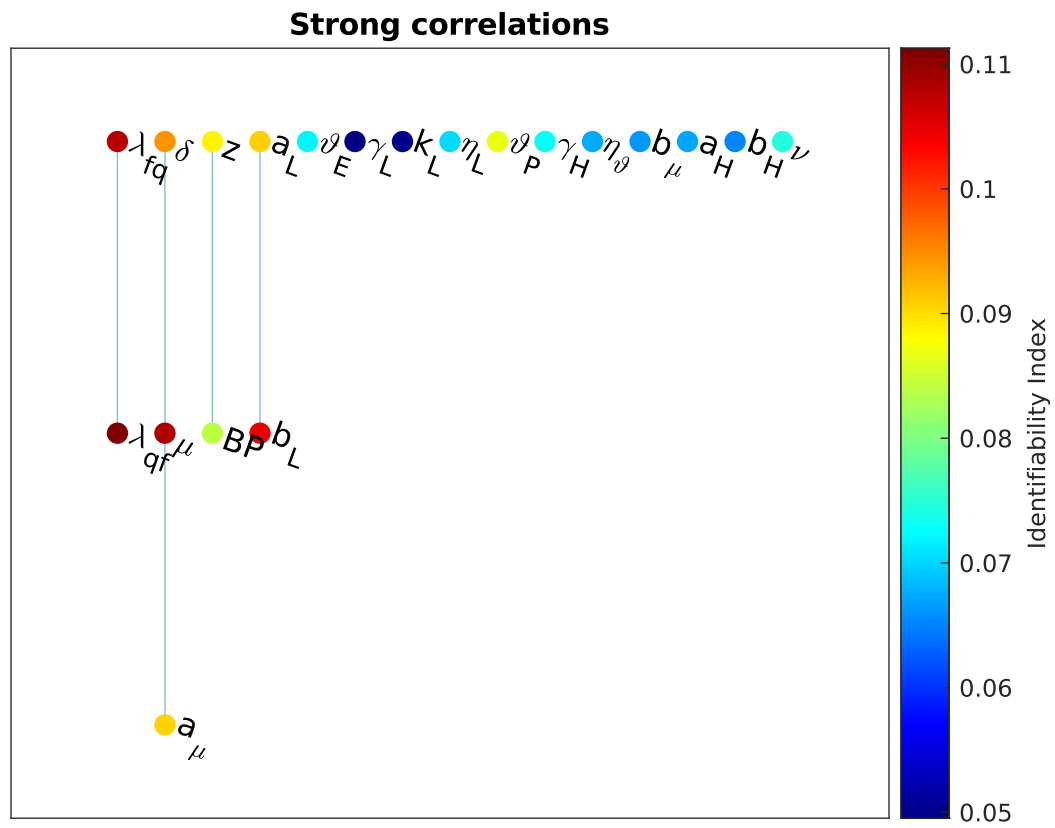
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1932'	'0.2606'	'0.2269'	'0.2238'	'0.1078'
$\vartheta_E$	'0.4043'	'0.4364'	'0.4203'	'0.1243'	'0.0722'
$\gamma_L$	'0.336'	'0.3497'	'0.3429'	'0.8233'	'0.0495'
$k_L$	'5.4121'	'5.5455'	'5.4788'	'7.024'	'0.05'
$\lambda_{qf}$	'0.1942'	'0.261'	'0.2276'	'0.013'	'0.1113'
$\delta$	'0.0272'	'0.0316'	'0.0294'	'0.1027'	'0.0946'
$\eta_L$	'0.4477'	'0.4834'	'0.4656'	'0.9952'	'0.0703'
$\vartheta_P$	'0.4628'	'0.5124'	'0.4876'	'0.0029'	'0.0867'
$\gamma_H$	'0.547'	'0.5765'	'0.5617'	'0.546'	'0.0728'
$z$	'20.9537'	'21.9237'	'21.4387'	'29.8694'	'0.0888'
$\eta_{\vartheta}$	'0.5368'	'0.5693'	'0.553'	'0.5715'	'0.0676'
$a_L$	'12.3812'	'12.7499'	'12.5655'	'14.7931'	'0.091'
$b_L$	'11.7238'	'12.2326'	'11.9782'	'3.6957'	'0.1045'
$a_{\mu}$	'3.3186'	'3.4724'	'3.3955'	'6.7436'	'0.0907'
$b_{\mu}$	'9.0394'	'9.4932'	'9.2663'	'7.7632'	'0.0664'
$\mu$	'0.4605'	'0.4971'	'0.4788'	'0.5473'	'0.1082'
$a_H$	'5.0069'	'5.4141'	'5.2105'	'4.7213'	'0.0672'
$b_H$	'8.9409'	'9.2881'	'9.1145'	'9.9016'	'0.0653'
$\nu$	'236.674'	'257.9176'	'247.2958'	'0.0257'	'0.0748'
BP	'120.2892'	'120.7108'	'120.5'	'116.5'	'0.0839'

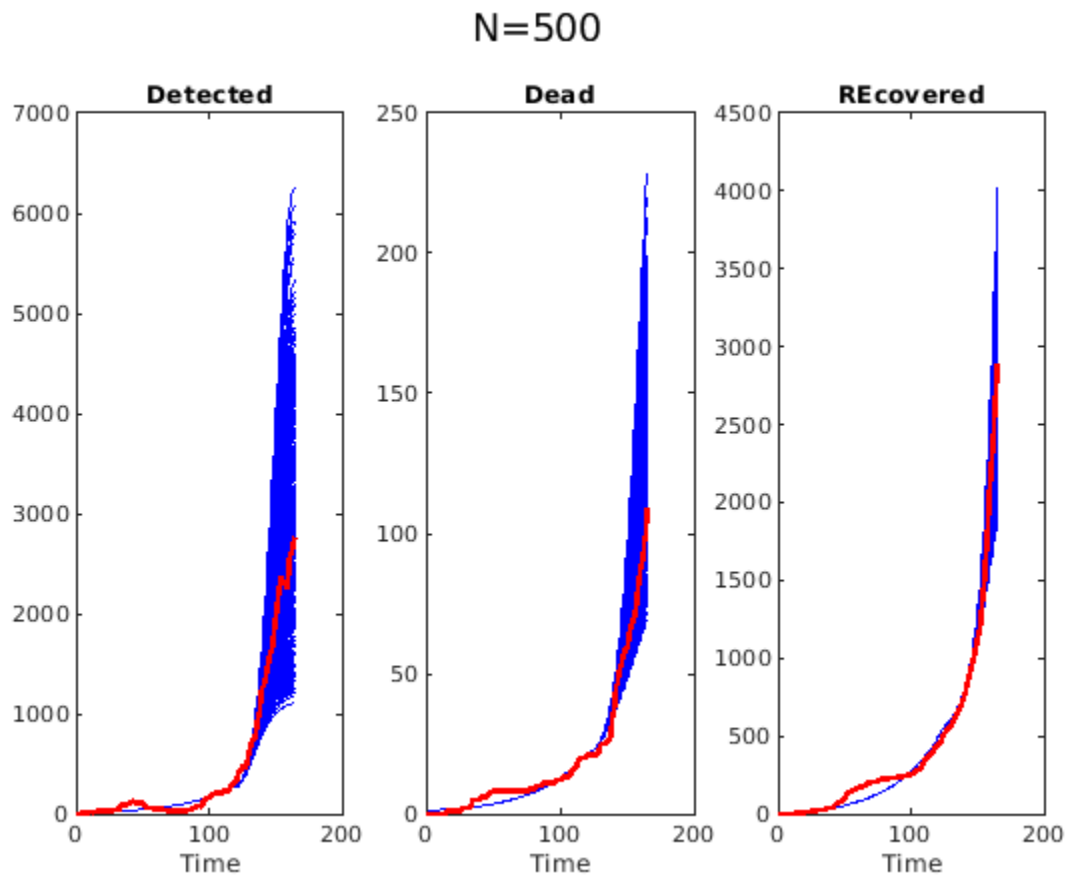
### 2.3. Identifiability analysys







## 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 data166 to the 187. The status of the validation is: COMPLETED.

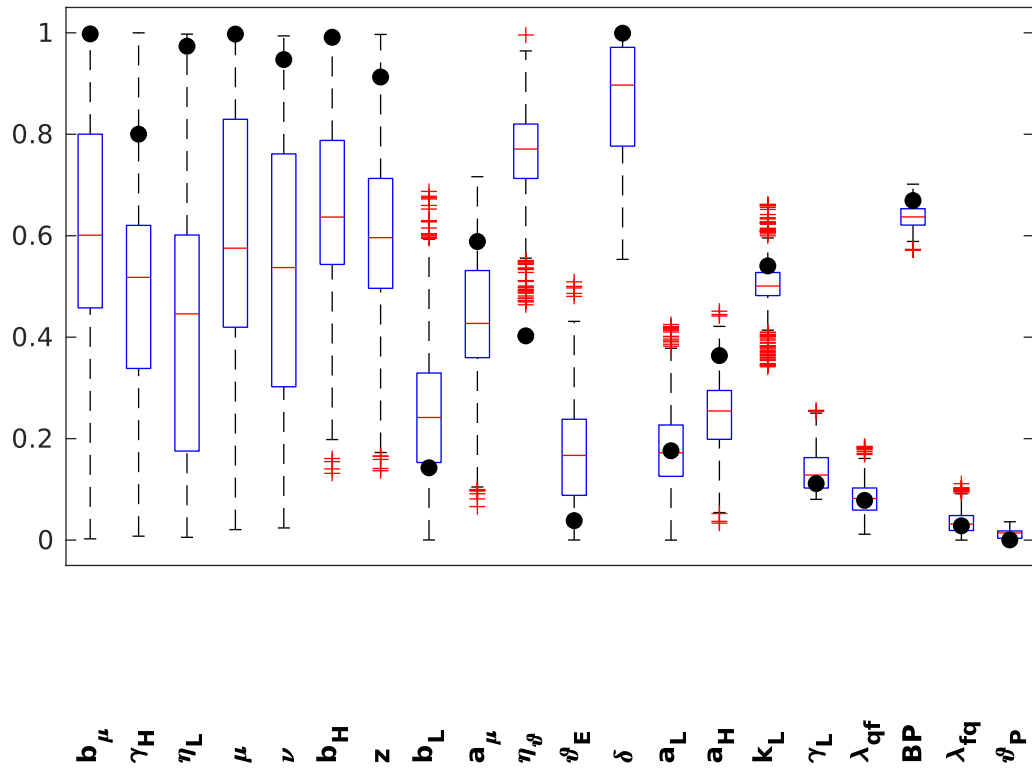
The number of estimations needed to perform the validation was1000.

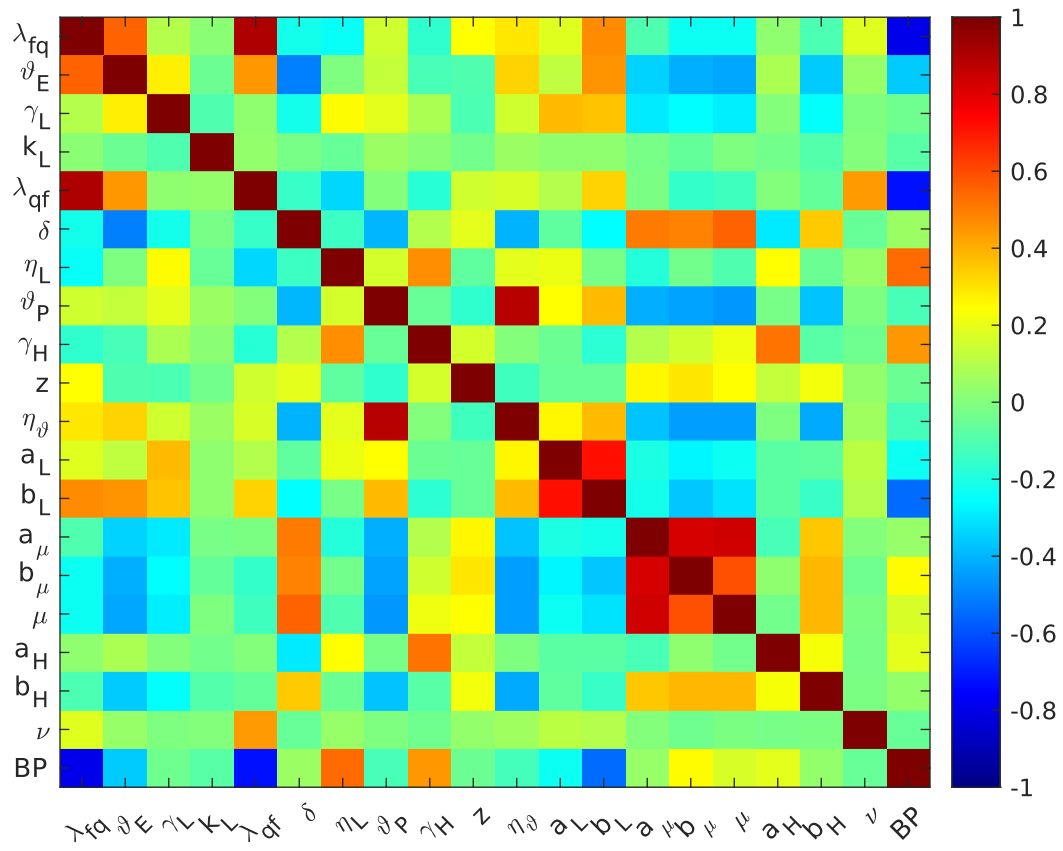
### 3.2. Estimated parameters with their intervals

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

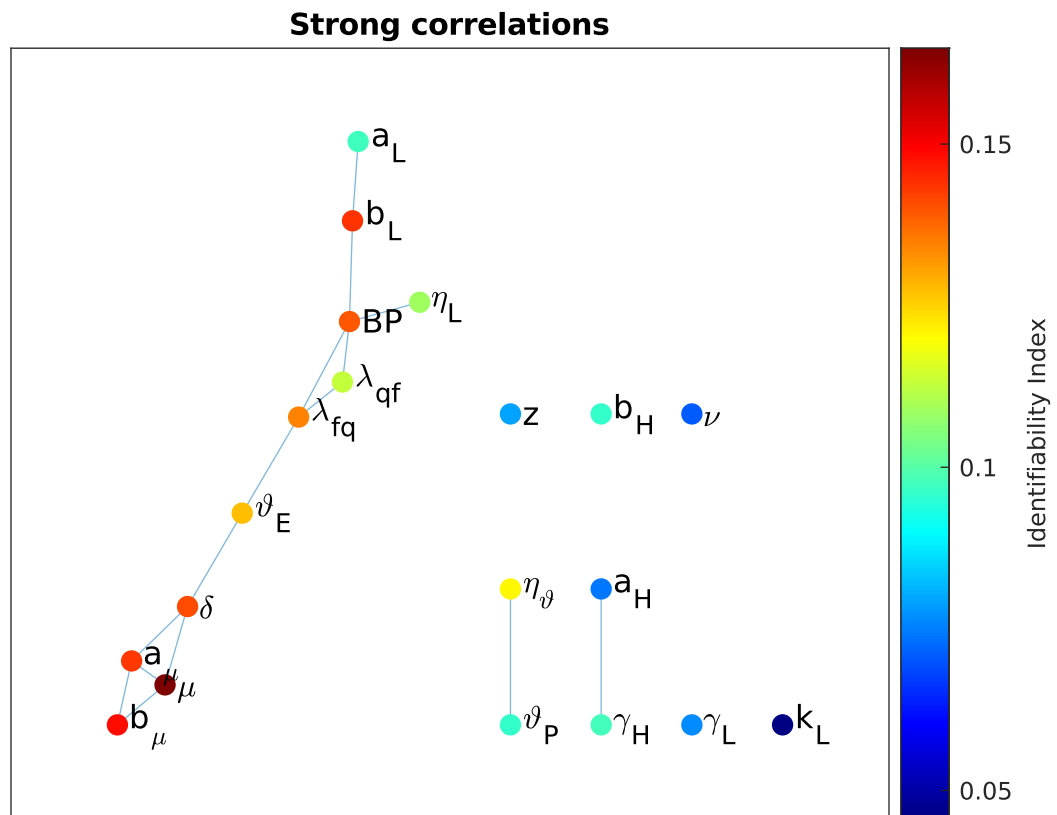
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0247'	'0.0384'	'0.0316'	'0.0282'	'0.1345'
$\vartheta_E$	'0.1539'	'0.1819'	'0.1679'	'0.0384'	'0.1276'
$\gamma_L$	'0.119'	'0.138'	'0.1285'	'0.1115'	'0.0765'
$k_L$	'5.4068'	'5.6082'	'5.5075'	'5.8648'	'0.0457'
$\lambda_{qf}$	'0.0735'	'0.0906'	'0.0821'	'0.0783'	'0.1129'
$\delta$	'0.1319'	'0.1371'	'0.1345'	'0.1499'	'0.141'
$\eta_L$	'0.4163'	'0.4757'	'0.446'	'0.9736'	'0.1086'
$\vartheta_P$	'0.0132'	'0.0151'	'0.0142'	'0.0004'	'0.0961'
$\gamma_H$	'0.4959'	'0.5401'	'0.518'	'0.8002'	'0.0982'
$z$	'17.2521'	'18.506'	'17.8791'	'27.3853'	'0.0793'
$\eta_{\vartheta}$	'0.7513'	'0.7901'	'0.7707'	'0.4026'	'0.1208'
$a_L$	'3.1962'	'3.6222'	'3.4092'	'3.4661'	'0.0975'
$b_L$	'4.015'	'4.7531'	'4.3841'	'2.9957'	'0.1436'
$a_{\mu}$	'6.7548'	'7.2025'	'6.9787'	'9.2401'	'0.1432'
$b_{\mu}$	'9.034'	'9.7946'	'9.4143'	'14.9699'	'0.1482'
$\mu$	'0.5436'	'0.6074'	'0.5755'	'0.9975'	'0.1648'
$a_H$	'4.4177'	'4.7066'	'4.5621'	'6.092'	'0.0742'
$b_H$	'9.6051'	'10.2119'	'9.9085'	'14.8765'	'0.0963'
$\nu$	'253.4135'	'283.8288'	'268.6212'	'473.6558'	'0.0709'
BP	'164.235'	'164.765'	'164.5'	'166.4993'	'0.1396'

### 3.3. Identifiability analysys

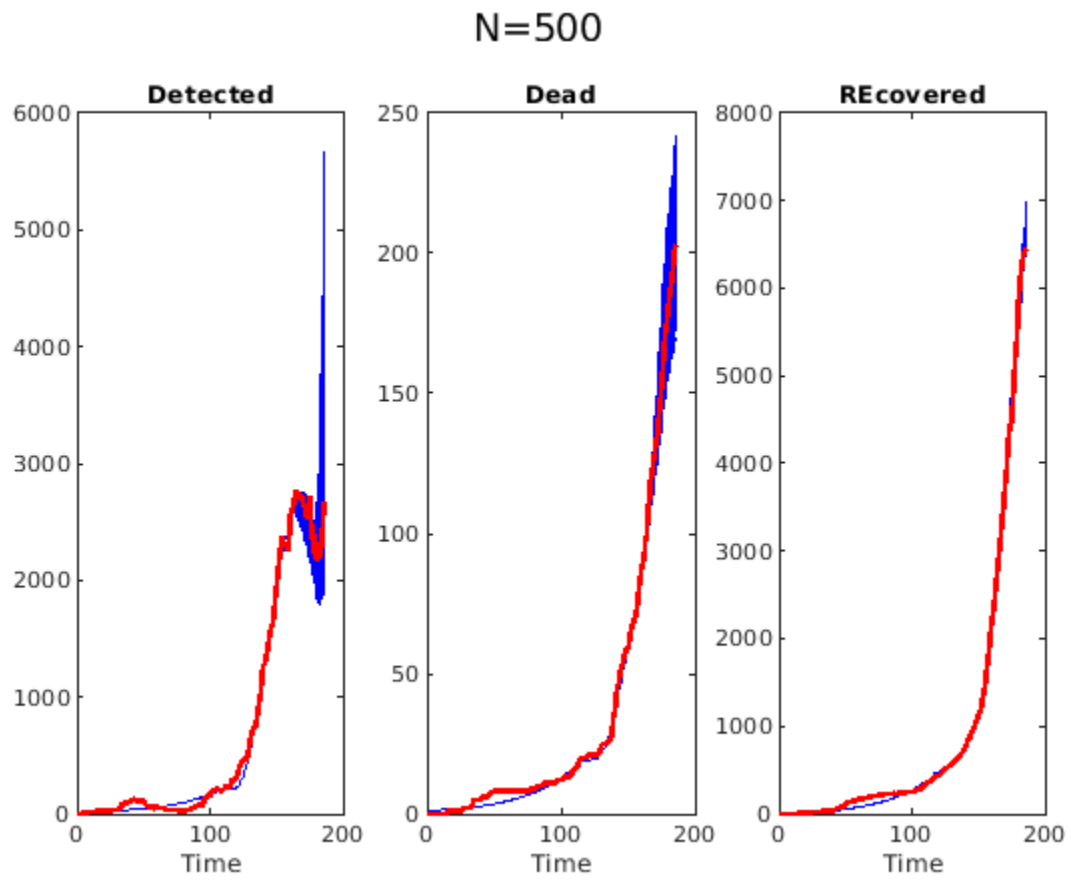








### 3.4. Uncertainty analysys



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## Chapter 4. Extension number4

### 4.1. Basic information

The extension to be validated consists of the time series from the data187 to the 213. The status of the validation is: COMPLETED.

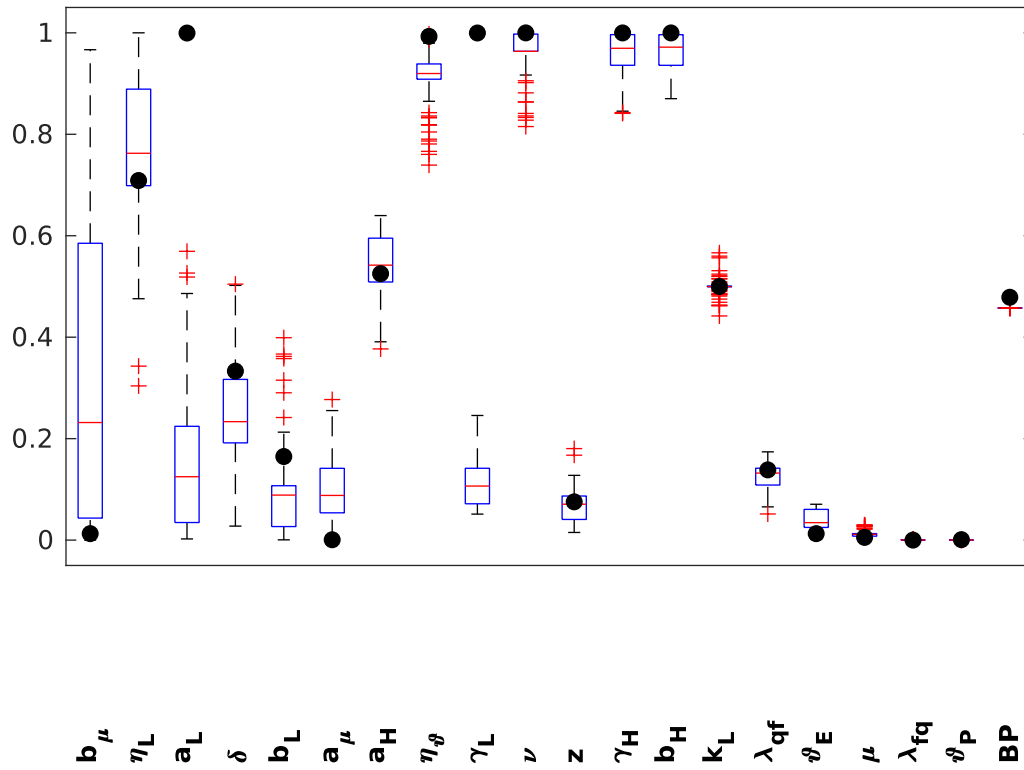
The number of estimations needed to perform the validation was1000.

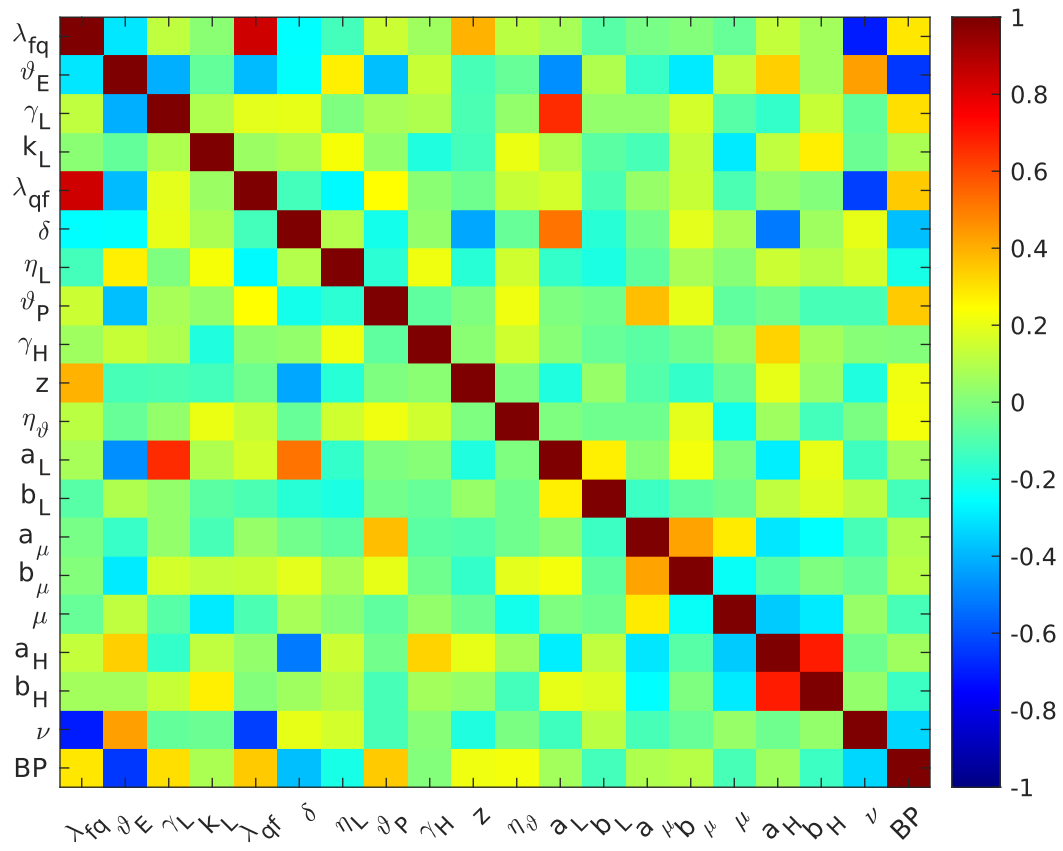
### 4.2. Estimated parameters with their intervals

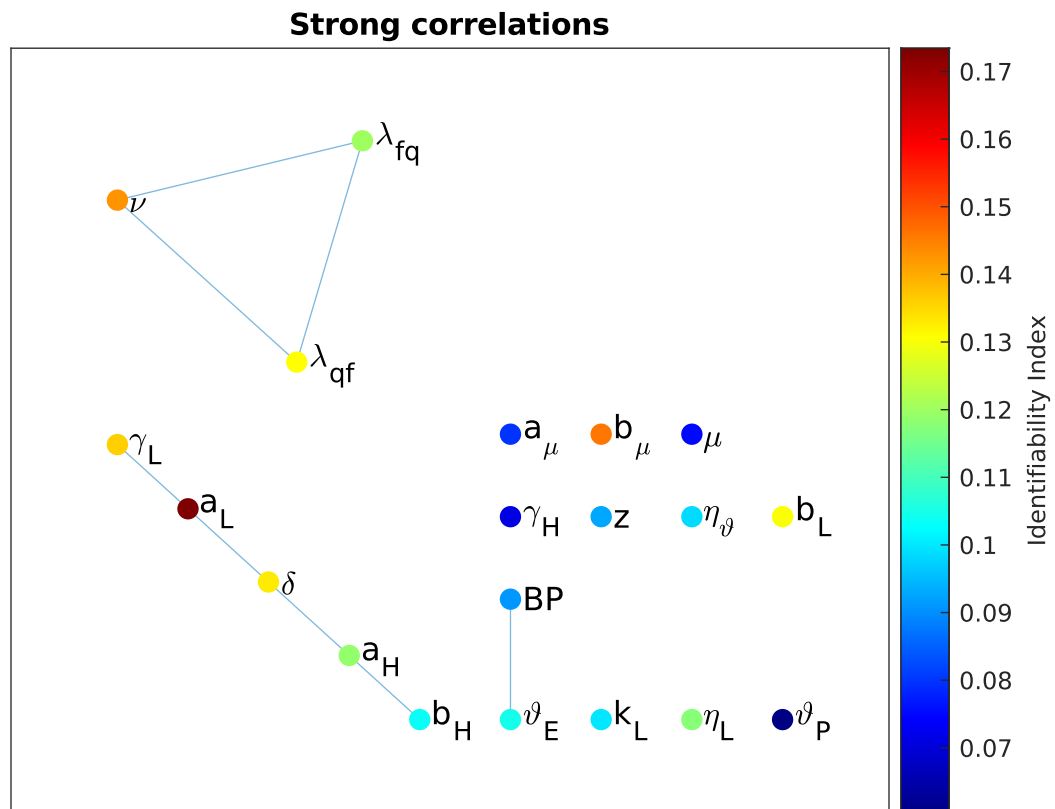
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0461'	'0.0004'	'0'	'0.1204'
$\vartheta_E$	'0.029'	'0.0398'	'0.0344'	'0.0127'	'0.105'
$\gamma_L$	'0.0448'	'0.1683'	'0.1065'	'0.9997'	'0.136'
$k_L$	'5.0854'	'5.9087'	'5.4971'	'5.5'	'0.0998'
$\lambda_{qf}$	'0.0995'	'0.1647'	'0.1321'	'0.1384'	'0.1308'
$\delta$	'0.0298'	'0.0402'	'0.035'	'0.05'	'0.1332'
$\eta_L$	'0.7055'	'0.8196'	'0.7626'	'0.7089'	'0.1176'
$\vartheta_P$	'0'	'0.0001'	'0'	'0.0009'	'0.0605'
$\gamma_H$	'0.9436'	'0.9954'	'0.9695'	'0.9998'	'0.0711'
$z$	'1.0414'	'3.2035'	'2.1224'	'2.2631'	'0.093'
$\eta_{\vartheta}$	'0.8712'	'0.9684'	'0.9198'	'0.993'	'0.0987'
$a_L$	'1.6389'	'3.8592'	'2.749'	'14.9942'	'0.1734'
$b_L$	'1.1111'	'3.3733'	'2.2422'	'3.3067'	'0.1305'
$a_{\mu}$	'1.9229'	'2.5425'	'2.2327'	'1.0092'	'0.0802'
$b_{\mu}$	'3.0329'	'5.4564'	'4.2446'	'1.1781'	'0.1461'
$\mu$	'0'	'0.0393'	'0.0113'	'0.0053'	'0.0755'
$a_H$	'8.3172'	'8.8589'	'8.5881'	'8.3532'	'0.1191'
$b_H$	'14.1464'	'15'	'14.6045'	'14.9972'	'0.1035'
$\nu$	'449.6038'	'500'	'481.7704'	'499.9397'	'0.1428'
BP	'187.3636'	'187.6364'	'187.5'	'188.5'	'0.0912'

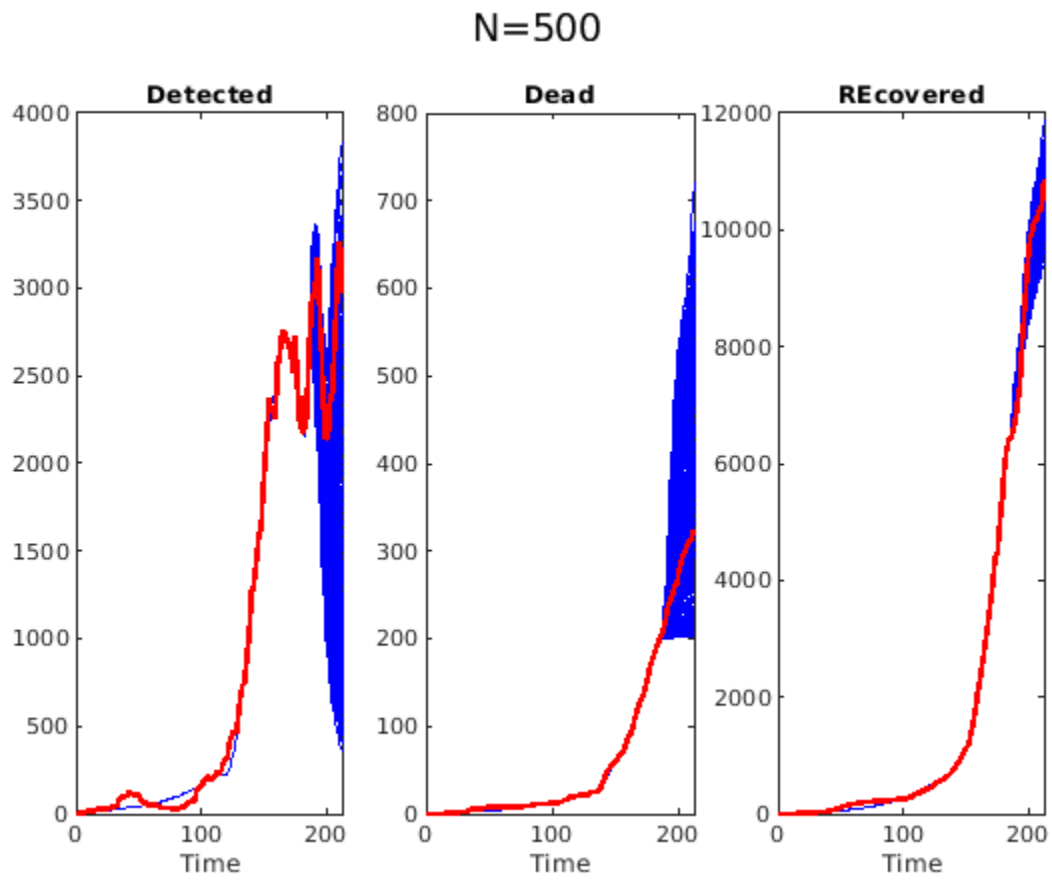
### 4.3. Identifiability analysis







#### 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 data213 to the 251. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

### 5.2. Estimated parameters with their intervals

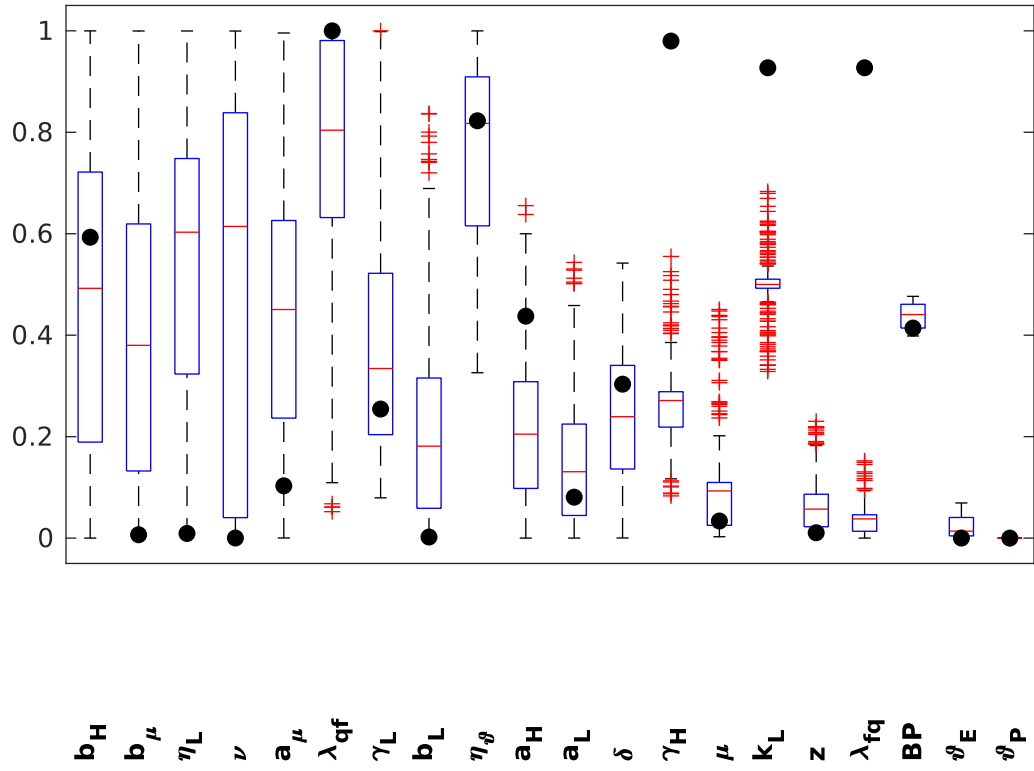
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

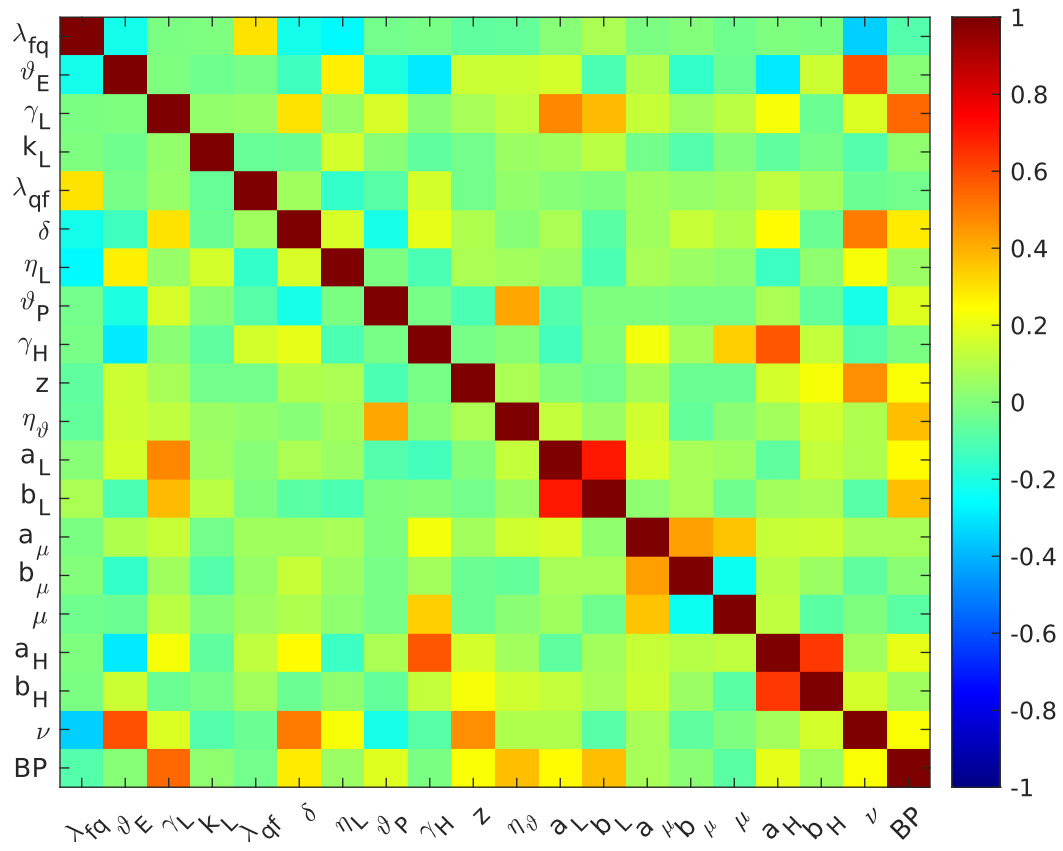
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

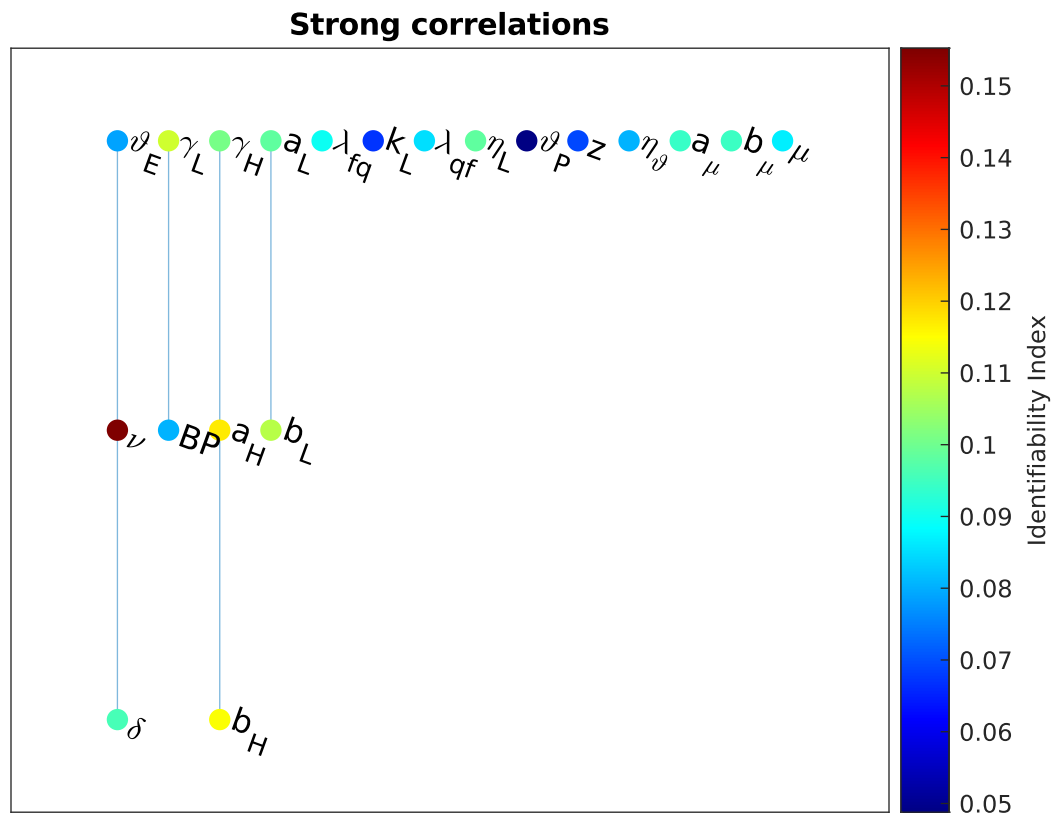
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.4218'	'0.9698'	'0.0378'	'0.9272'	'0.0899'
$\vartheta_E$	'0'	'0.0002'	'0.0137'	'0.0001'	'0.0789'
$\gamma_L$	'0.2514'	'0.5794'	'0.3343'	'0.2544'	'0.11'
$k_L$	'2.5336'	'9.7013'	'5.5001'	'9.3446'	'0.0675'
$\lambda_{qf}$	'0.9919'	'1'	'0.8041'	'1'	'0.085'
$\delta$	'0.0363'	'0.0501'	'0.0359'	'0.0455'	'0.0959'
$\eta_L$	'0.0044'	'0.218'	'0.603'	'0.0091'	'0.0983'
$\vartheta_P$	'0'	'0'	'0'	'0'	'0.0488'
$\gamma_H$	'0.4631'	'1'	'0.2712'	'0.9798'	'0.101'
$z$	'0.2442'	'0.3392'	'1.7159'	'0.3169'	'0.0695'
$\eta_{\vartheta}$	'0.5892'	'0.9625'	'0.8174'	'0.8227'	'0.0807'
$a_L$	'2.0921'	'2.985'	'2.8322'	'2.1296'	'0.0986'
$b_L$	'1.0128'	'1.5115'	'3.5377'	'1.0298'	'0.1077'
$a_{\mu}$	'2.4333'	'3.4927'	'7.3086'	'2.4428'	'0.0942'
$b_{\mu}$	'1.02'	'1.45'	'6.3199'	'1.0925'	'0.0948'
$\mu$	'0.0063'	'0.039'	'0.0929'	'0.0337'	'0.0868'
$a_H$	'6.9382'	'10.1368'	'3.8692'	'7.1244'	'0.1172'
$b_H$	'6.6041'	'10.544'	'7.8932'	'9.3039'	'0.1147'
$\nu$	'0.0098'	'0.1991'	'307.2393'	'0.0885'	'0.1552'
BP	'213.3142'	'218.0273'	'215.2048'	'213.4999'	'0.0806'



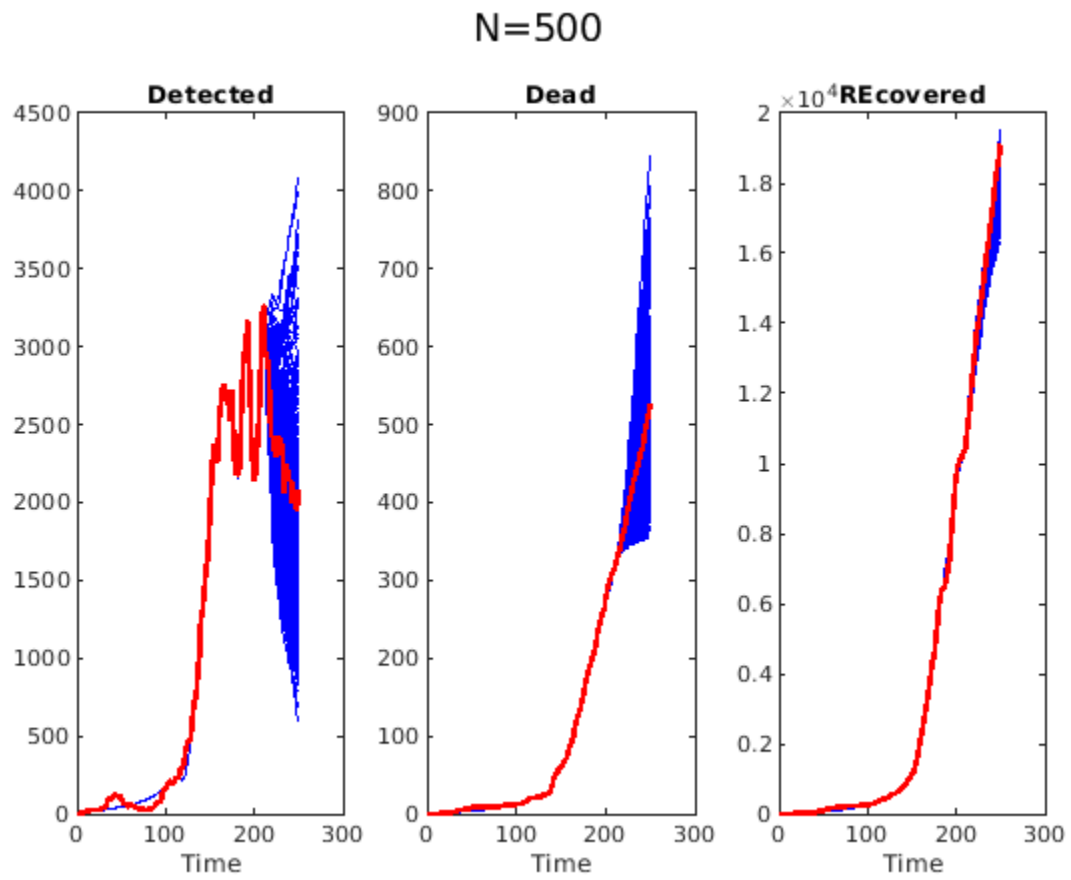
### 5.3. Identifiability analysys







## 5.4. Uncertainty analysis



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## Chapter 6. Extension number6

### 6.1. Basic information

The extension to be validated consists of the time series from the data251 to the 286. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

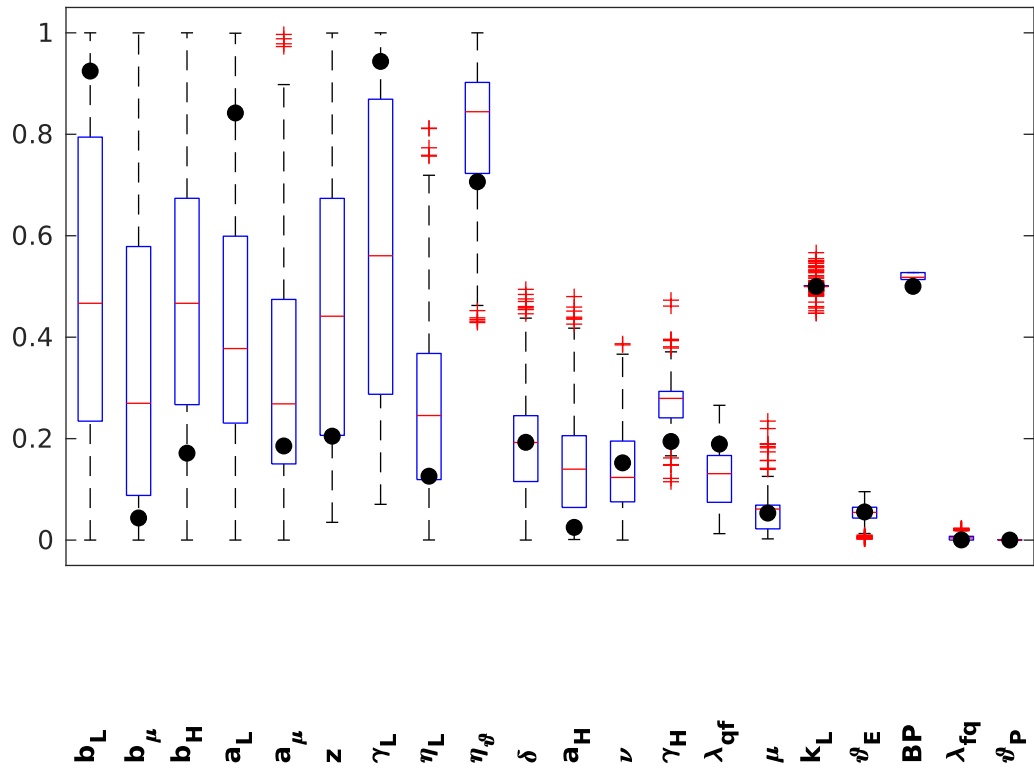
### 6.2. Estimated parameters with their intervals

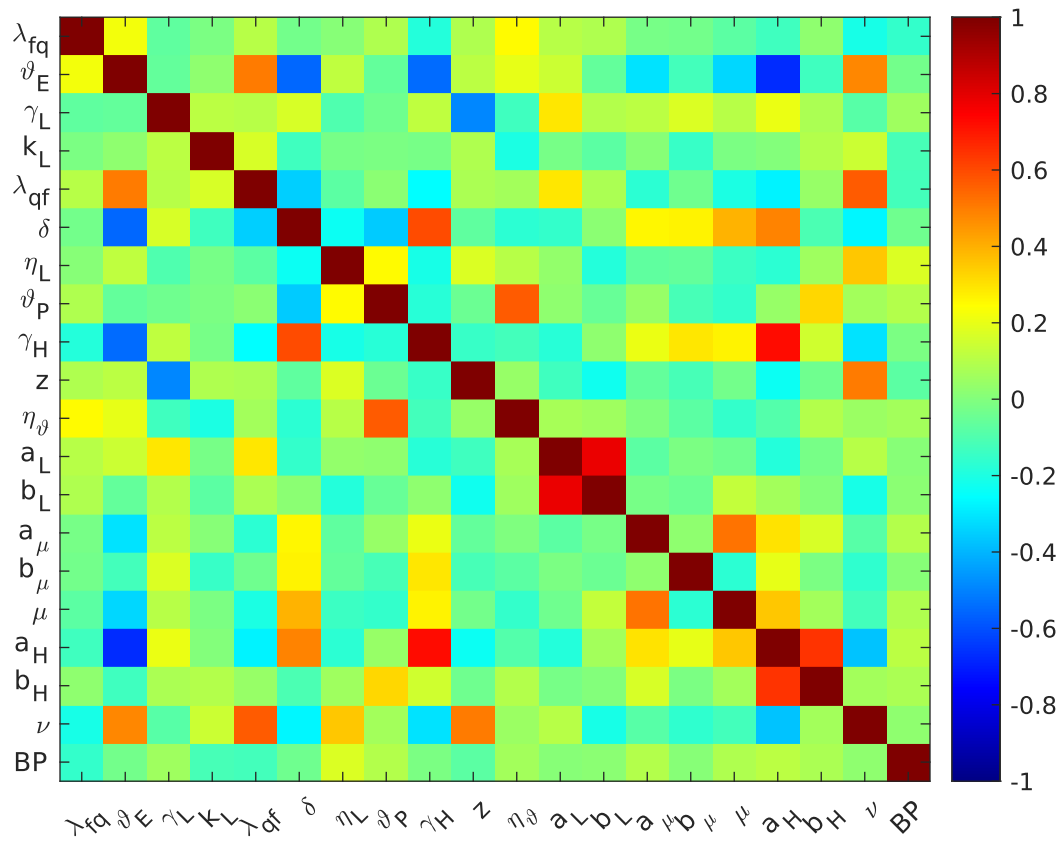
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

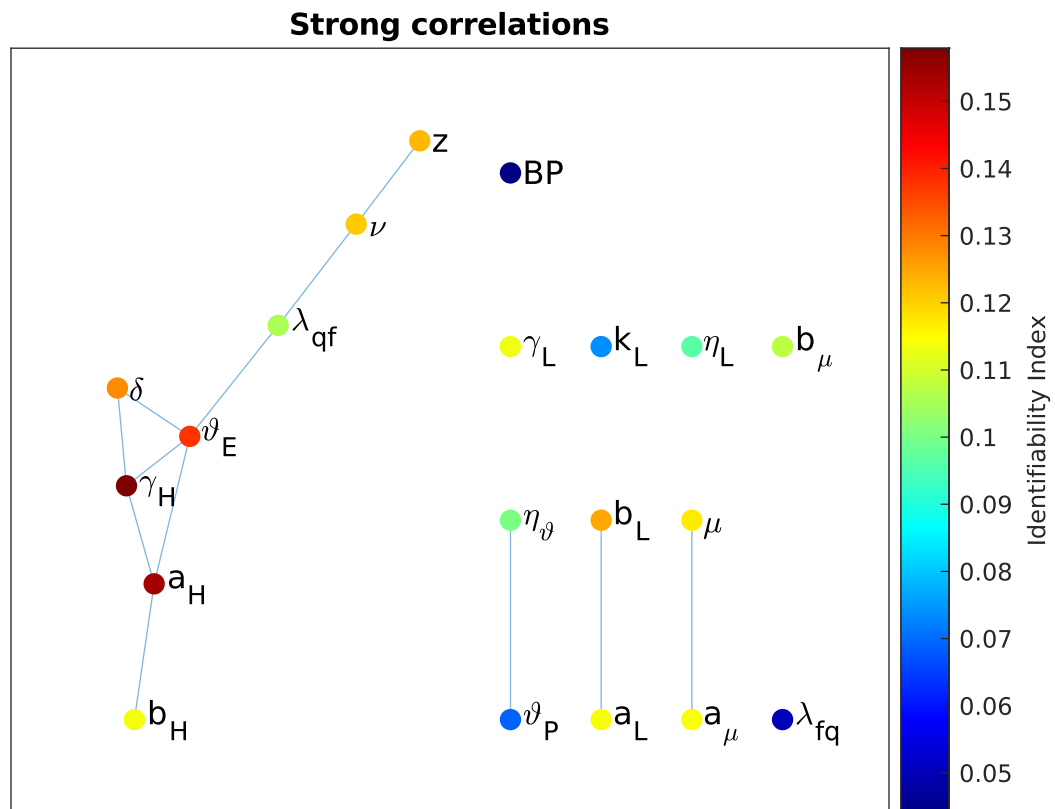
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0002'	'0.0043'	'0.0043'	'0.0003'	'0.0506'
$\vartheta_E$	'0.0538'	'0.0707'	'0.0546'	'0.0555'	'0.1378'
$\gamma_L$	'0.2607'	'1'	'0.5605'	'0.9437'	'0.1133'
$k_L$	'1.5081'	'9.64'	'5.5006'	'5.4997'	'0.0743'
$\lambda_{qf}$	'0.186'	'0.3298'	'0.1309'	'0.1893'	'0.1056'
$\delta$	'0.0049'	'0.0445'	'0.0289'	'0.0289'	'0.1279'
$\eta_L$	'0.0866'	'0.1836'	'0.2456'	'0.126'	'0.097'
$\vartheta_P$	'0'	'0.0001'	'0.0002'	'0.0001'	'0.0693'
$\gamma_H$	'0.1674'	'0.5103'	'0.2794'	'0.1944'	'0.1579'
$z$	'6.0921'	'9.9354'	'13.2402'	'6.147'	'0.1232'
$\eta_{\vartheta}$	'0.704'	'0.9009'	'0.8445'	'0.7064'	'0.1005'
$a_L$	'6.7678'	'13.5265'	'6.2868'	'12.7887'	'0.1143'
$b_L$	'3.8093'	'15'	'7.5357'	'13.9444'	'0.1248'
$a_{\mu}$	'3.4247'	'10.2458'	'4.7599'	'3.5981'	'0.1145'
$b_{\mu}$	'1.1826'	'5.103'	'4.7759'	'1.6107'	'0.1076'
$\mu$	'0.0054'	'0.1051'	'0.0612'	'0.0532'	'0.1173'
$a_H$	'1.178'	'2.9727'	'2.9578'	'1.3515'	'0.1535'
$b_H$	'2.5636'	'6.6019'	'7.5354'	'3.3997'	'0.1138'
$\nu$	'69.5843'	'84.3966'	'61.7609'	'76.1369'	'0.121'
BP	'249.3497'	'253.4484'	'250.8176'	'249.5157'	'0.0442'

### 6.3. Identifiability analysis

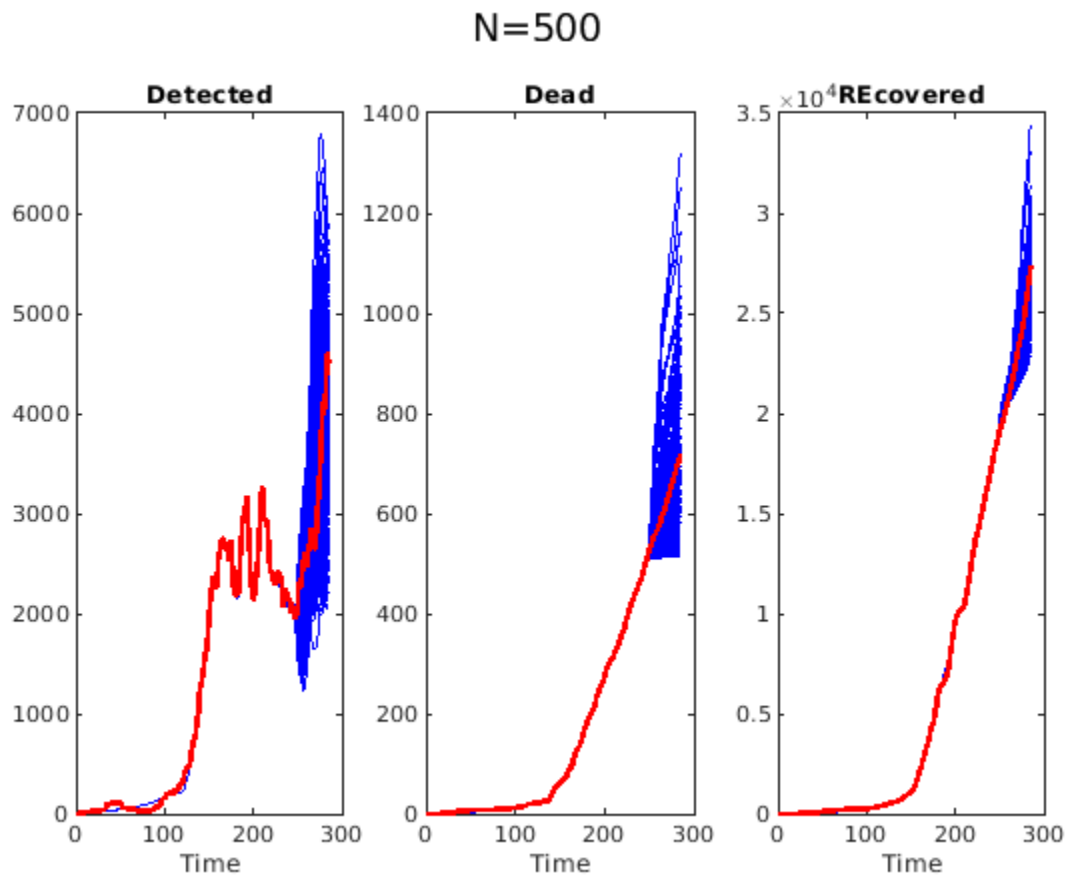








## 6.4. Uncertainty analysis



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## Chapter 7. Extension number7

### 7.1. Basic information

The extension to be validated consists of the time series from the data286 to the 316. The status of the validation is: COMPLETED.

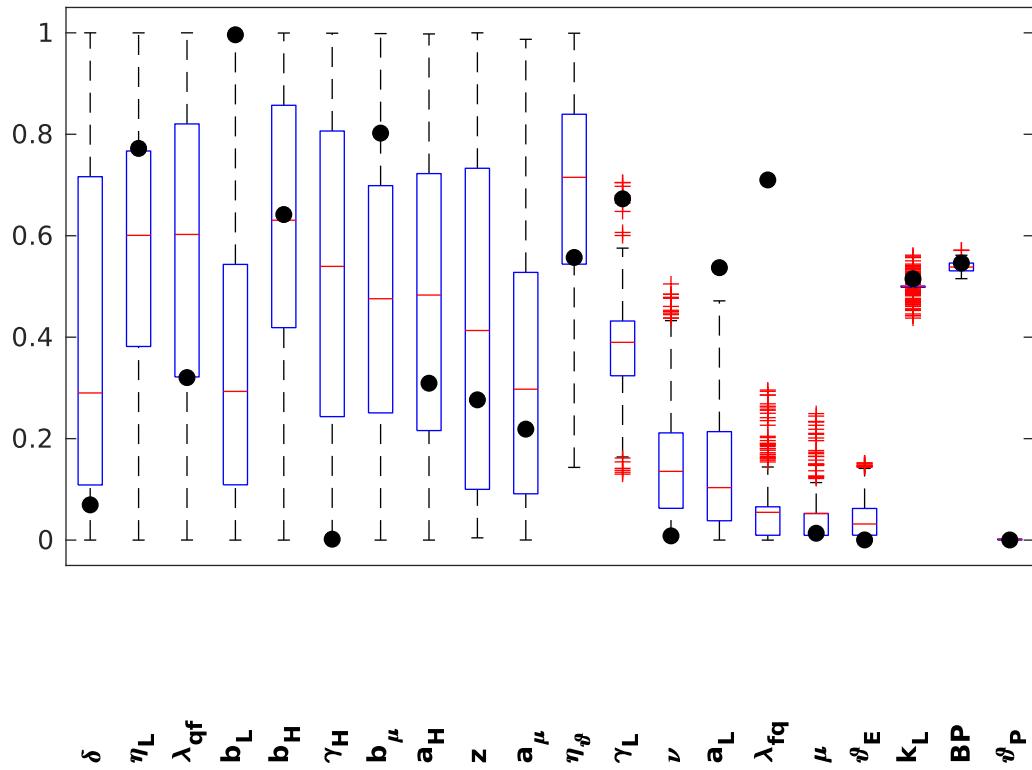
The number of estimations needed to perform the validation was1000.

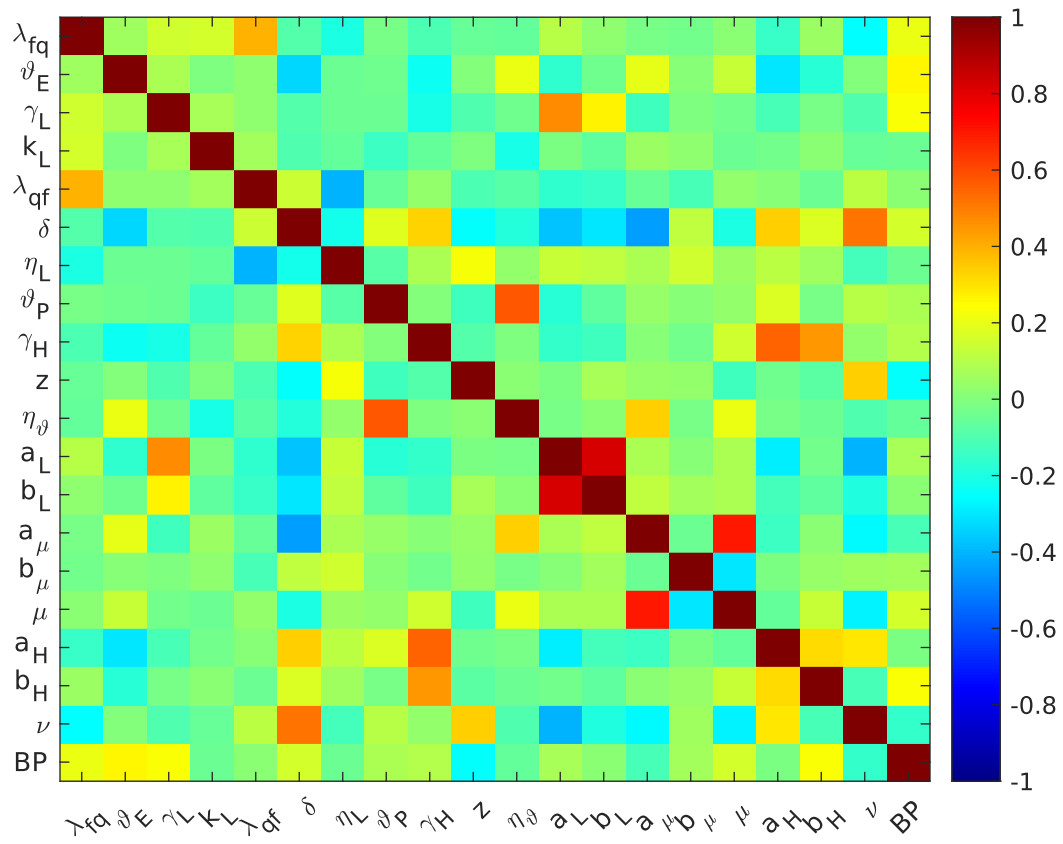
### 7.2. Estimated parameters with their intervals

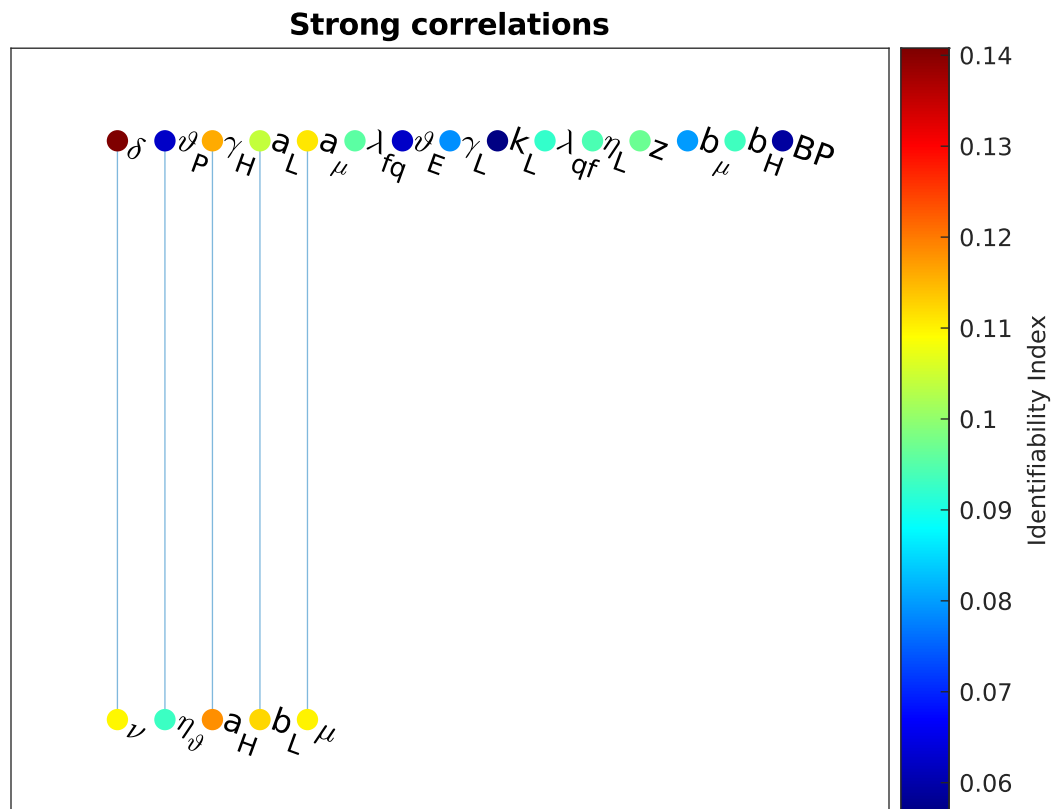
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0109'	'0.0987'	'0.0548'	'0.71'	'0.0957'
$\vartheta_E$	'0.0234'	'0.0402'	'0.0318'	'0.0004'	'0.0623'
$\gamma_L$	'0.3637'	'0.416'	'0.3899'	'0.6728'	'0.0791'
$k_L$	'5.348'	'5.6521'	'5.5'	'5.6358'	'0.0568'
$\lambda_{qf}$	'0.5606'	'0.6445'	'0.6026'	'0.3203'	'0.0925'
$\delta$	'0.0365'	'0.0505'	'0.0435'	'0.0104'	'0.1408'
$\eta_L$	'0.5597'	'0.6418'	'0.6008'	'0.7722'	'0.0944'
$\vartheta_P$	'0.0007'	'0.0013'	'0.001'	'0.0003'	'0.0625'
$\gamma_H$	'0.4956'	'0.5835'	'0.5396'	'0.0018'	'0.116'
$z$	'10.978'	'13.8132'	'12.3956'	'8.295'	'0.0969'
$\eta_{\vartheta}$	'0.6876'	'0.7427'	'0.7152'	'0.5571'	'0.0929'
$a_L$	'2.1391'	'2.7576'	'2.4483'	'8.5189'	'0.1041'
$b_L$	'4.5335'	'5.674'	'5.1037'	'14.9459'	'0.1125'
$a_{\mu}$	'4.6388'	'5.6903'	'5.1645'	'4.0627'	'0.111'
$b_{\mu}$	'7.0941'	'8.2295'	'7.6618'	'12.2323'	'0.0799'
$\mu$	'0.0152'	'0.0897'	'0.0524'	'0.0135'	'0.1102'
$a_H$	'7.1696'	'8.3566'	'7.7631'	'5.3296'	'0.1184'
$b_H$	'9.238'	'10.4183'	'9.8281'	'9.9851'	'0.0932'
$\nu$	'53.4134'	'82.0764'	'67.7449'	'4.1715'	'0.1098'
BP	'285.6292'	'286.3449'	'285.987'	'286.4998'	'0.0591'

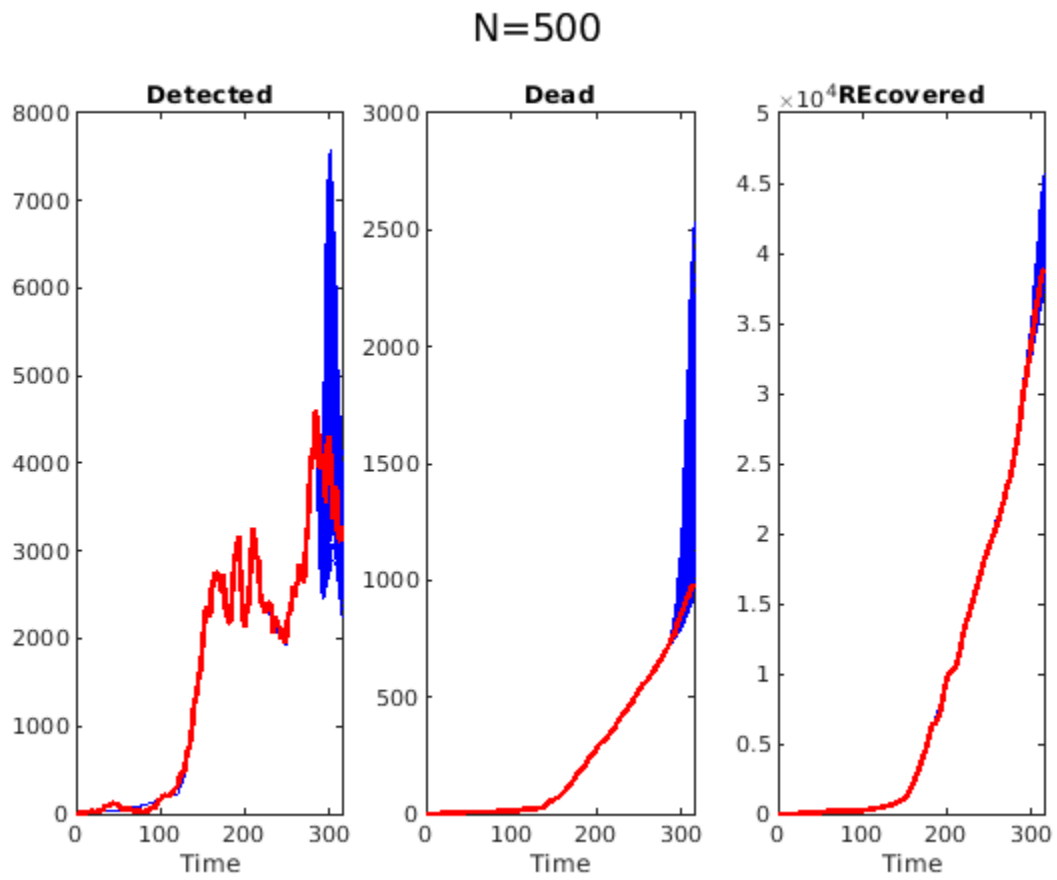
### 7.3. Identifiability analysis







## 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 data316 to the 326. The status of the validation is: COMPLETED.

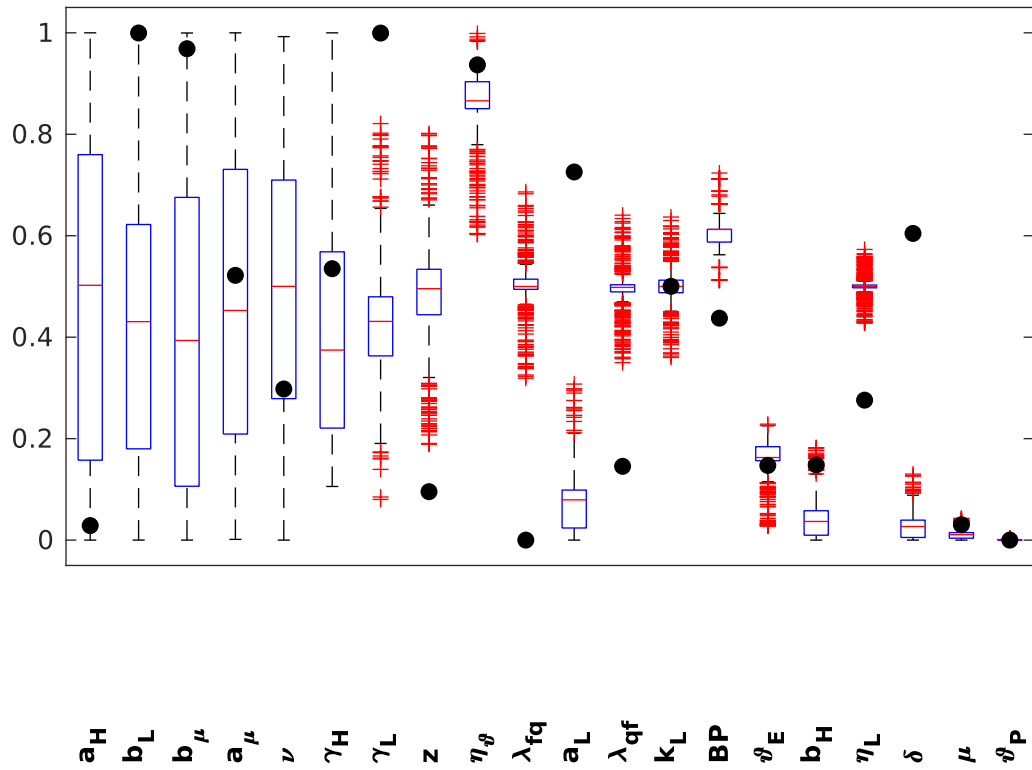
The number of estimations needed to perform the validation was1000.

### 8.2. Estimated parameters with their intervals

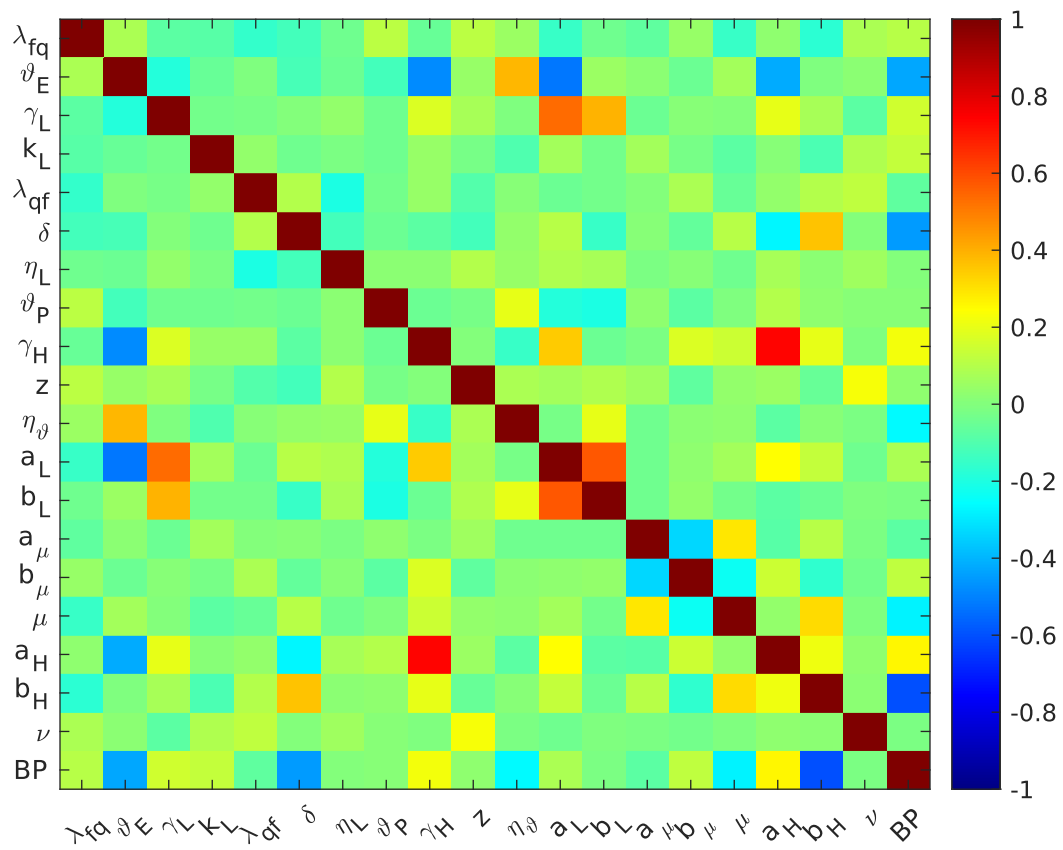
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

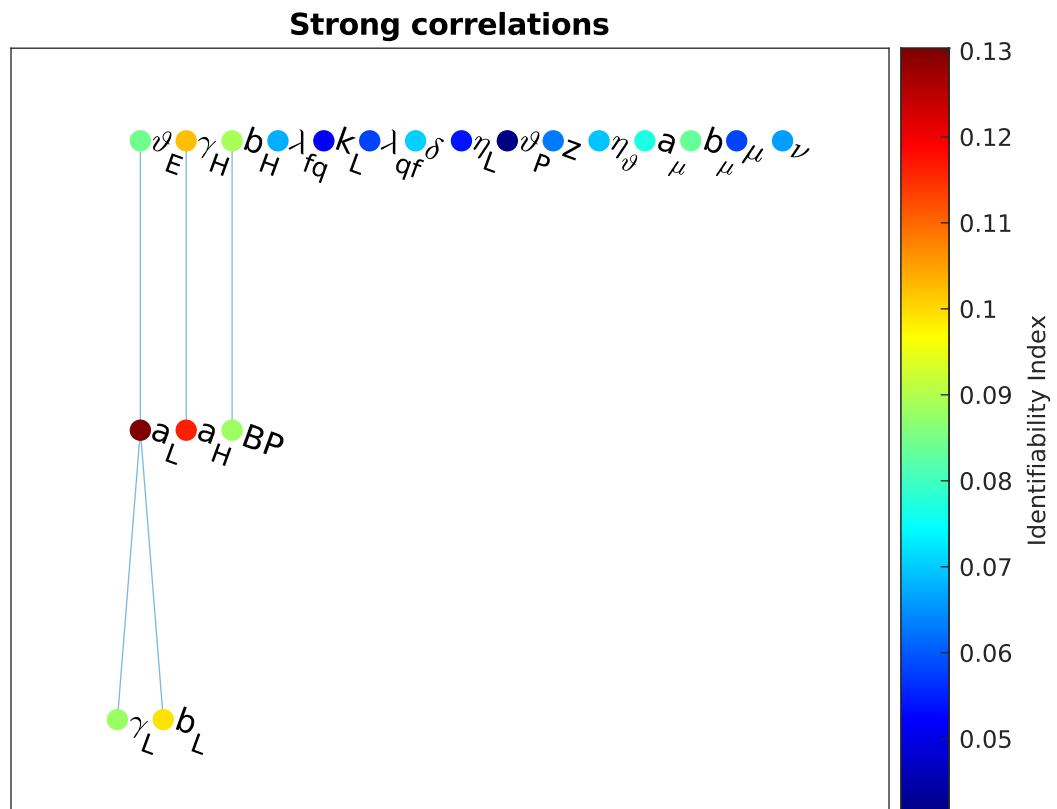
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.4788'	'0.5212'	'0.5'	'0'	'0.0675'
$\vartheta_E$	'0.1542'	'0.1711'	'0.1626'	'0.1472'	'0.0843'
$\gamma_L$	'0.4071'	'0.4552'	'0.4311'	'0.9995'	'0.0881'
$k_L$	'5.3673'	'5.6327'	'5.5'	'5.5026'	'0.0522'
$\lambda_{qf}$	'0.4799'	'0.5164'	'0.4981'	'0.1454'	'0.0582'
$\delta$	'0.0015'	'0.0066'	'0.004'	'0.0907'	'0.0706'
$\eta_L$	'0.4833'	'0.5164'	'0.4998'	'0.2759'	'0.054'
$\vartheta_P$	'0.0003'	'0.0008'	'0.0005'	'0'	'0.0415'
$\gamma_H$	'0.3468'	'0.4025'	'0.3746'	'0.535'	'0.1024'
$z$	'14.2283'	'15.5089'	'14.8686'	'2.8634'	'0.063'
$\eta_{\vartheta}$	'0.8428'	'0.889'	'0.8659'	'0.9369'	'0.0696'
$a_L$	'1.7446'	'2.4802'	'2.1124'	'11.1596'	'0.1303'
$b_L$	'6.5312'	'7.5272'	'7.0292'	'14.9954'	'0.0993'
$a_{\mu}$	'6.8439'	'7.832'	'7.3379'	'8.3071'	'0.077'
$b_{\mu}$	'5.9877'	'7.0313'	'6.5095'	'14.5615'	'0.0835'
$\mu$	'0.0015'	'0.0199'	'0.0107'	'0.0303'	'0.0582'
$a_H$	'7.4734'	'8.5925'	'8.033'	'1.4003'	'0.1161'
$b_H$	'1.2646'	'1.7637'	'1.5142'	'3.0752'	'0.0893'
$\nu$	'234.6599'	'265.5644'	'250.1122'	'148.9515'	'0.0664'
BP	'310.1217'	'310.8783'	'310.5'	'303.5001'	'0.088'

## 8.3. Identifiability analysis

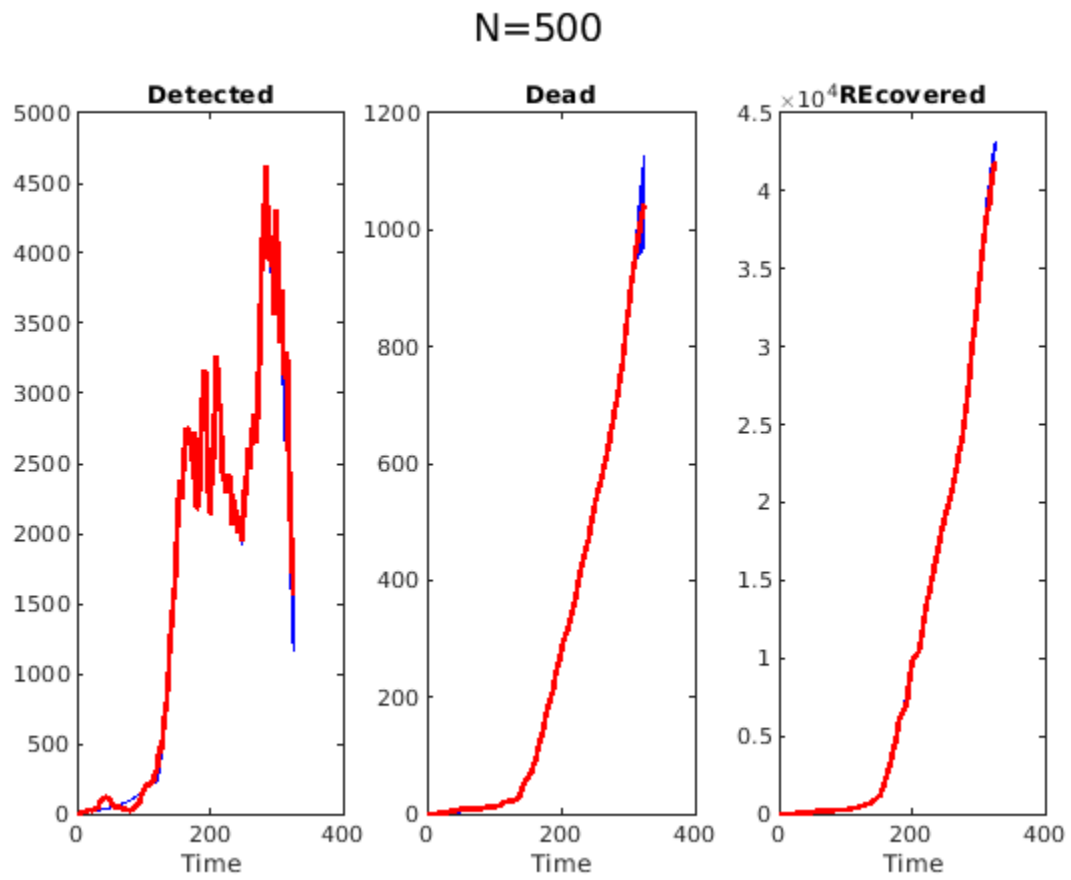








## 8.4. Uncertainty analysys



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## Chapter 9. Extension number9

### 9.1. Basic information

The extension to be validated consists of the time series from the data326 to the 353. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

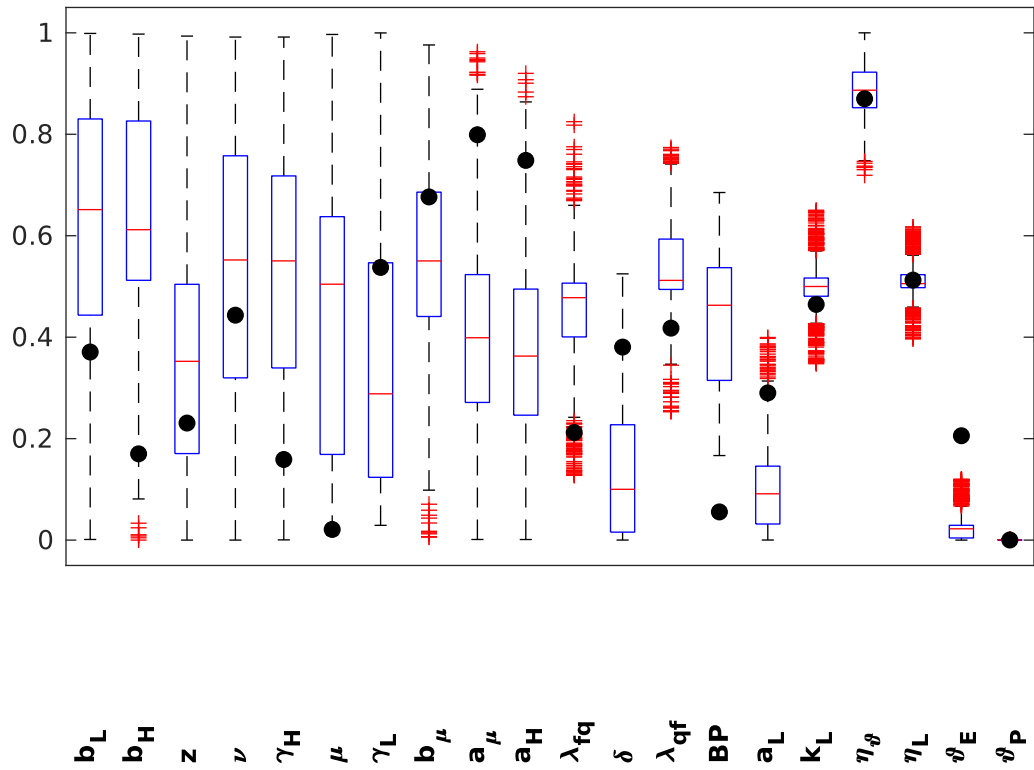
### 9.2. Estimated parameters with their intervals

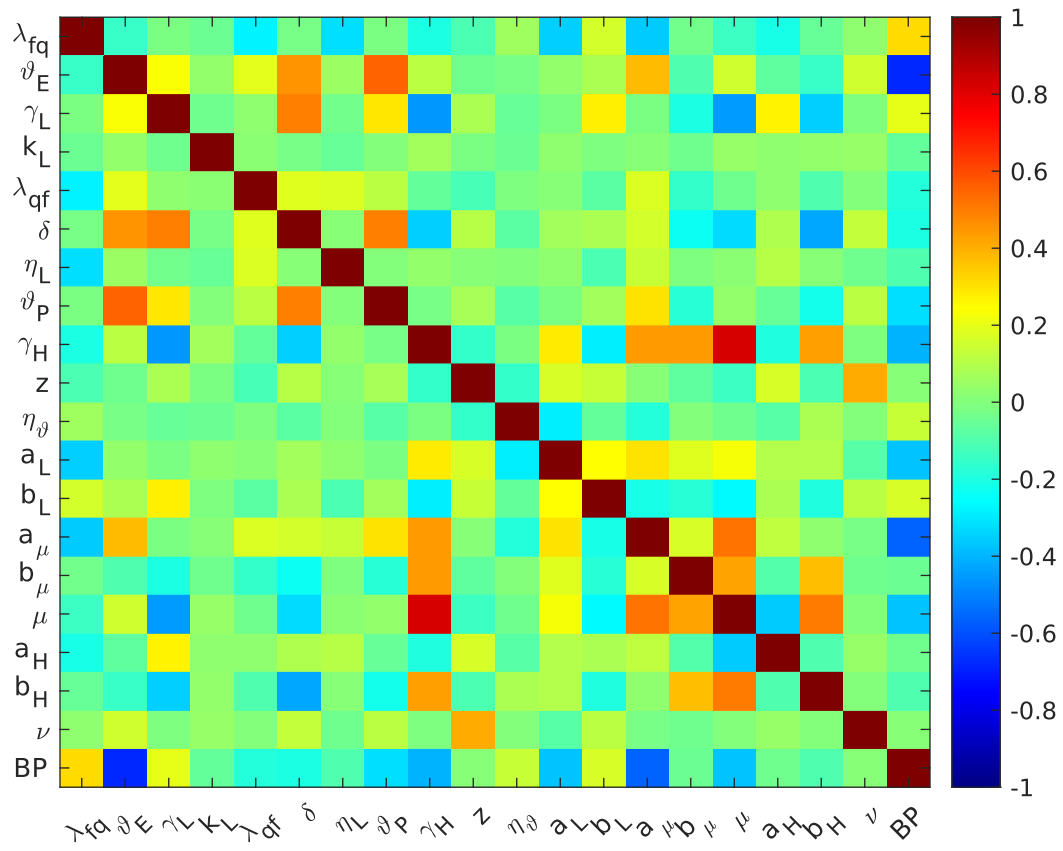
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

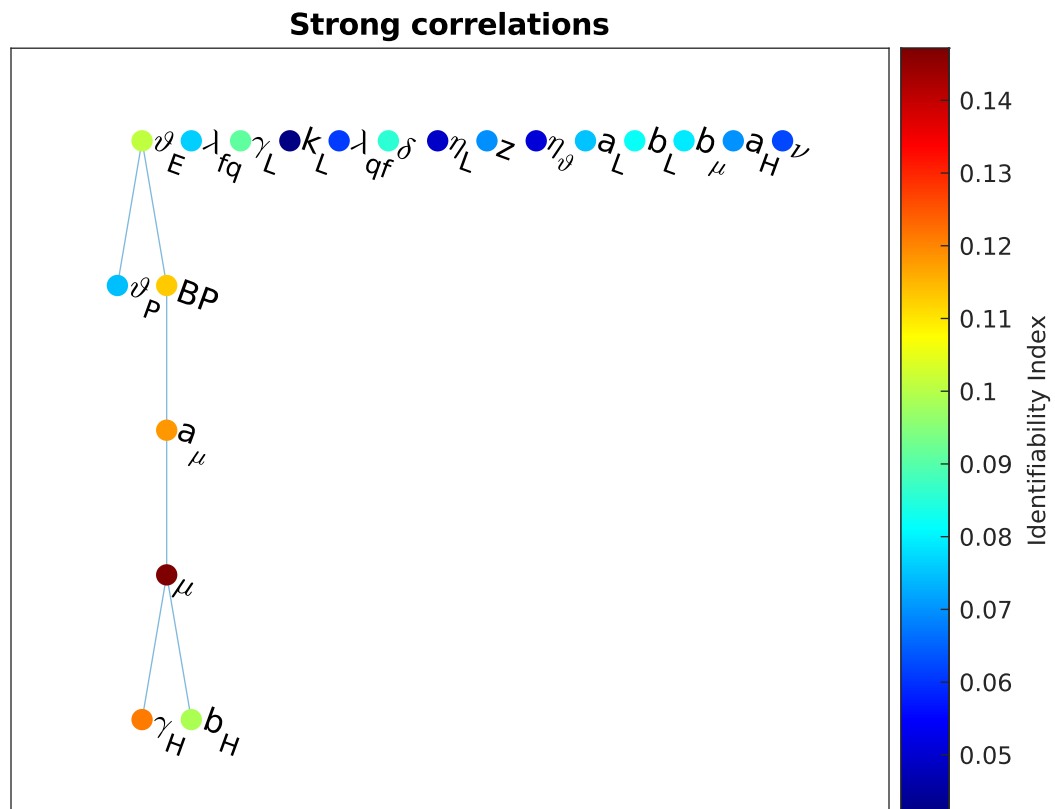
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1338'	'0.9134'	'0.4779'	'0.212'	'0.0764'
$\vartheta_E$	'0.1405'	'0.336'	'0.0223'	'0.2057'	'0.1012'
$\gamma_L$	'0.258'	'0.6014'	'0.2884'	'0.5375'	'0.091'
$k_L$	'1'	'10'	'5.4995'	'5.182'	'0.0421'
$\lambda_{qf}$	'0'	'0.5117'	'0.512'	'0.4178'	'0.0614'
$\delta$	'0.0561'	'0.1147'	'0.015'	'0.0571'	'0.0859'
$\eta_L$	'0.0396'	'1'	'0.5056'	'0.5125'	'0.0491'
$\vartheta_P$	'0'	'0.0004'	'0.0004'	'0.0002'	'0.0746'
$\gamma_H$	'0.0573'	'0.1704'	'0.5504'	'0.1589'	'0.121'
$z$	'0'	'14.0172'	'10.5725'	'6.9221'	'0.07'
$\eta_{\vartheta}$	'0.5114'	'0.9744'	'0.8869'	'0.8699'	'0.0509'
$a_L$	'2.6957'	'5.9056'	'2.2779'	'5.0619'	'0.075'
$b_L$	'5.7727'	'13.556'	'10.1209'	'6.1905'	'0.082'
$a_{\mu}$	'1'	'12.97'	'6.5846'	'12.1865'	'0.1182'
$b_{\mu}$	'1'	'14.3'	'8.7046'	'10.4711'	'0.0791'
$\mu$	'0'	'0.0404'	'0.5045'	'0.021'	'0.1472'
$a_H$	'7.1801'	'15'	'6.0785'	'11.4794'	'0.07'
$b_H$	'1'	'6.7479'	'9.5662'	'3.3808'	'0.0987'
$\nu$	'170.3667'	'500'	'276.1102'	'221.6994'	'0.0623'
BP	'316.8932'	'322.9443'	'328.5'	'317.5'	'0.1131'

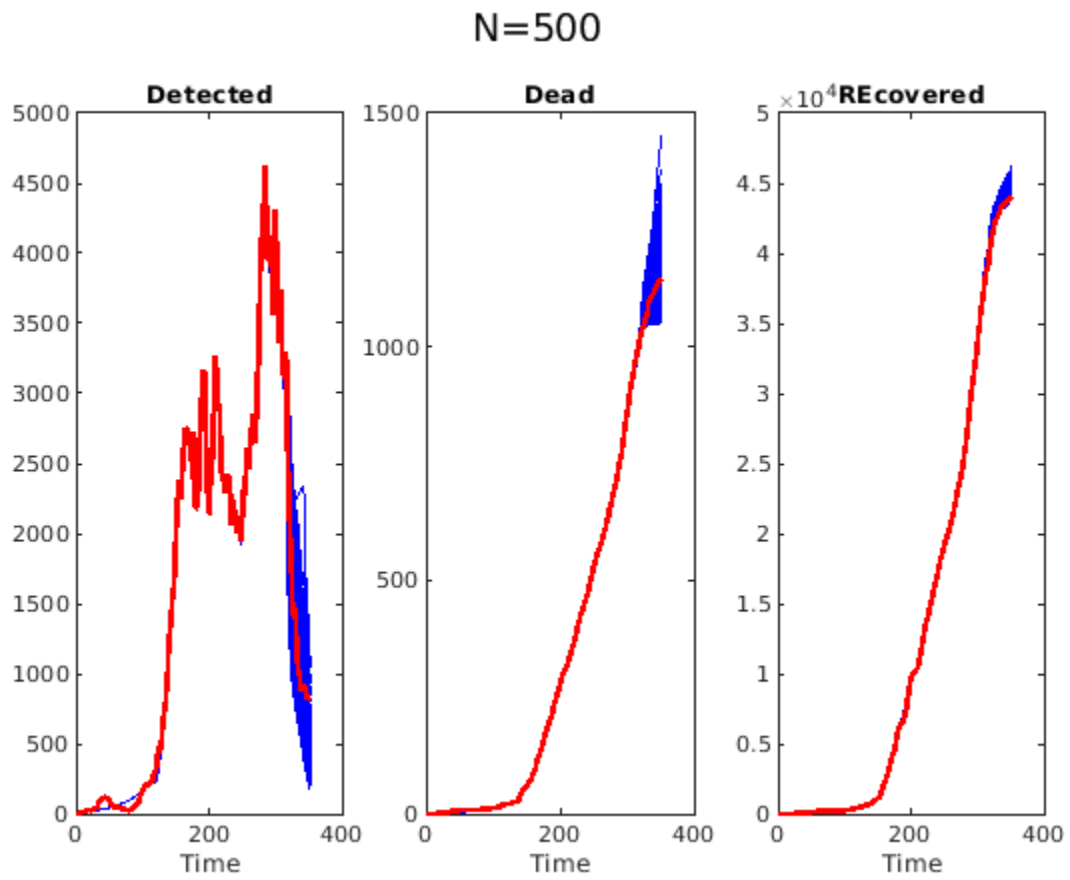
### 9.3. Identifiability analysis







## 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 data353 to the 406. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

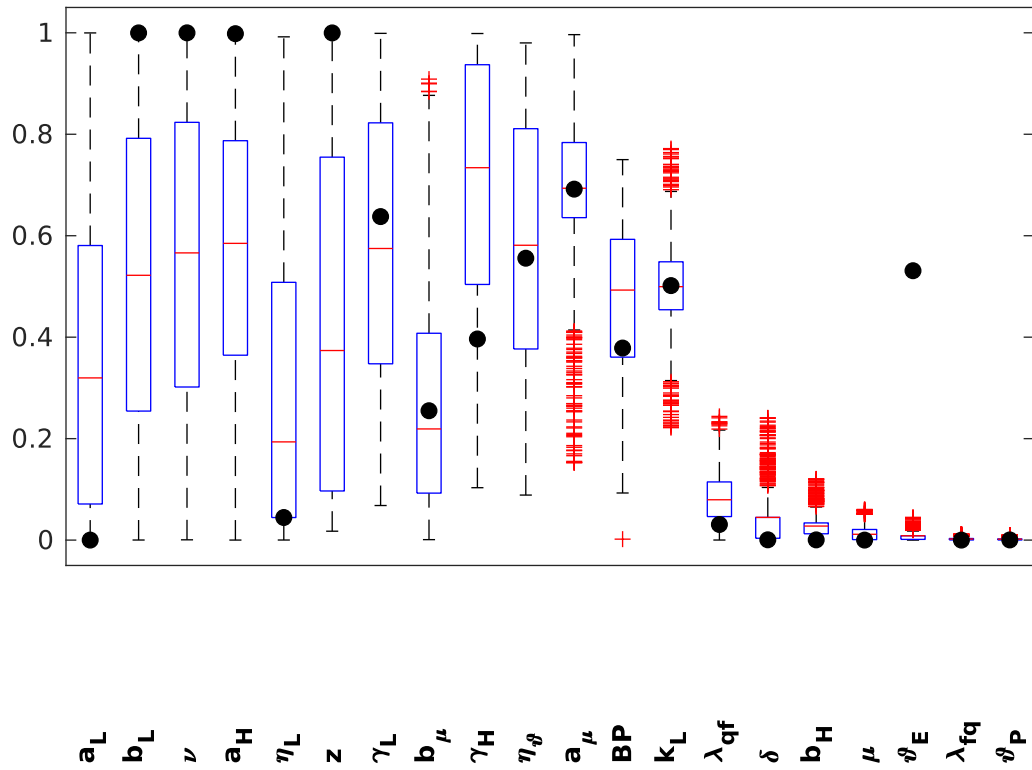
### 10.2. Estimated parameters with their intervals

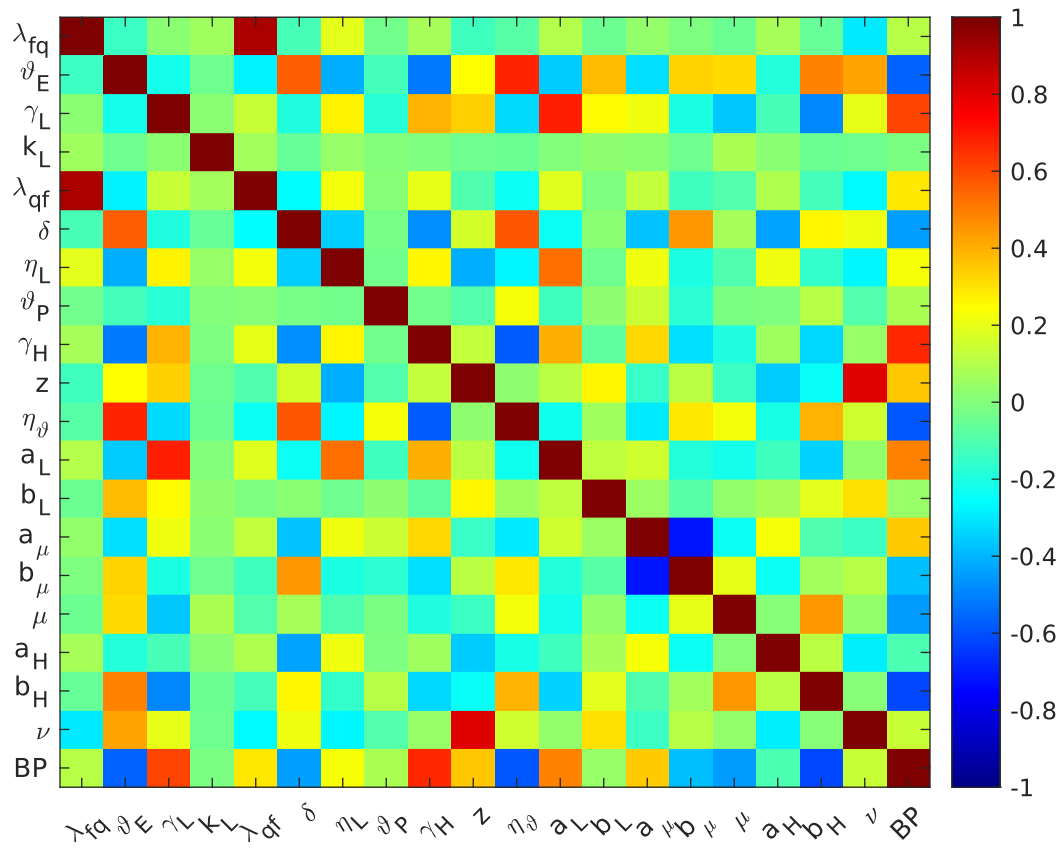
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

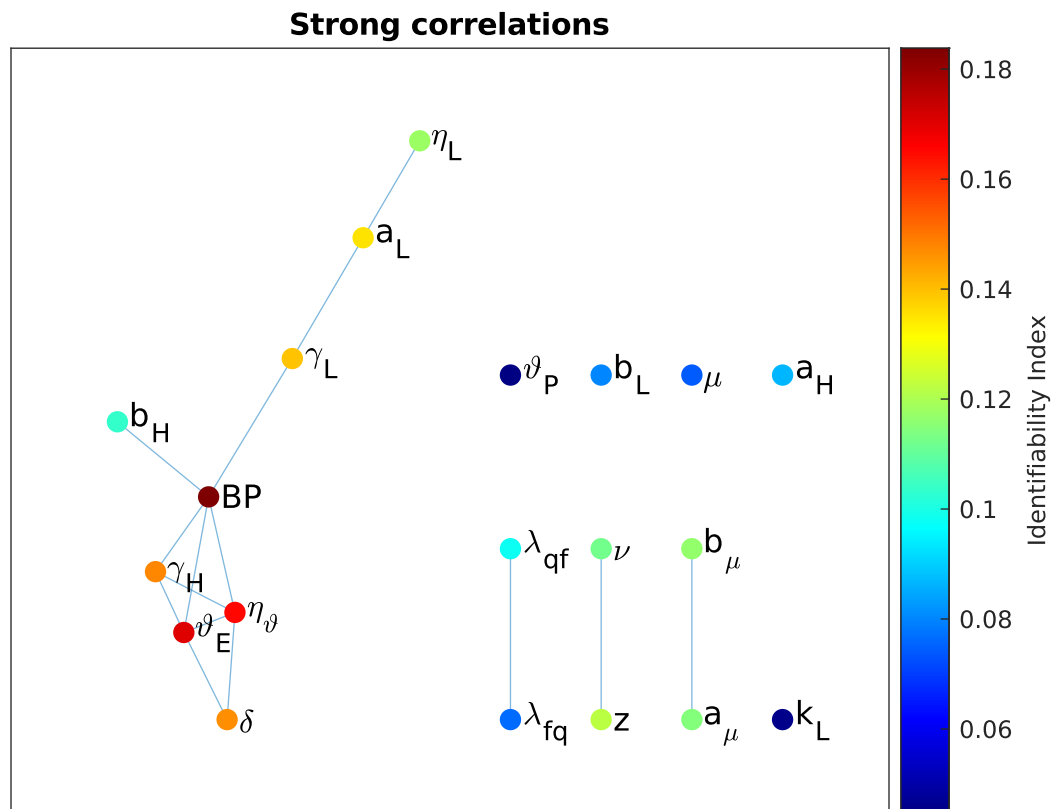
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0'	'0.0022'	'0'	'0.0768'
$\vartheta_E$	'0.3493'	'0.6926'	'0.0085'	'0.531'	'0.1708'
$\gamma_L$	'0.2753'	'1'	'0.5748'	'0.6377'	'0.1395'
$k_L$	'1.18'	'10'	'5.4962'	'5.5151'	'0.0465'
$\lambda_{qf}$	'0.0196'	'0.0411'	'0.0795'	'0.0308'	'0.0981'
$\delta$	'0'	'0.0002'	'0.0067'	'0.0001'	'0.1465'
$\eta_L$	'0.01'	'0.0681'	'0.1936'	'0.0445'	'0.1176'
$\vartheta_P$	'0'	'0.0007'	'0.0019'	'0.0003'	'0.0449'
$\gamma_H$	'0'	'0.892'	'0.7341'	'0.3964'	'0.1476'
$z$	'20.9926'	'30'	'11.2107'	'29.9933'	'0.1224'
$\eta_{\vartheta}$	'0.3365'	'0.9652'	'0.5812'	'0.5557'	'0.1649'
$a_L$	'1'	'8.5207'	'5.4761'	'1.0003'	'0.1354'
$b_L$	'4.227'	'15'	'8.3077'	'14.9975'	'0.0805'
$a_{\mu}$	'1'	'15'	'10.7101'	'10.6855'	'0.1146'
$b_{\mu}$	'1'	'15'	'4.0679'	'4.5702'	'0.117'
$\mu$	'0'	'0'	'0.0115'	'0'	'0.0743'
$a_H$	'1'	'15'	'9.189'	'14.9758'	'0.0871'
$b_H$	'1'	'14.44'	'1.3874'	'1.006'	'0.104'
$\nu$	'372.2546'	'500'	'283.0729'	'499.9656'	'0.1125'
BP	'351.7241'	'363.3742'	'360.5'	'352.4999'	'0.1838'

### 10.3. Identifiability analysis

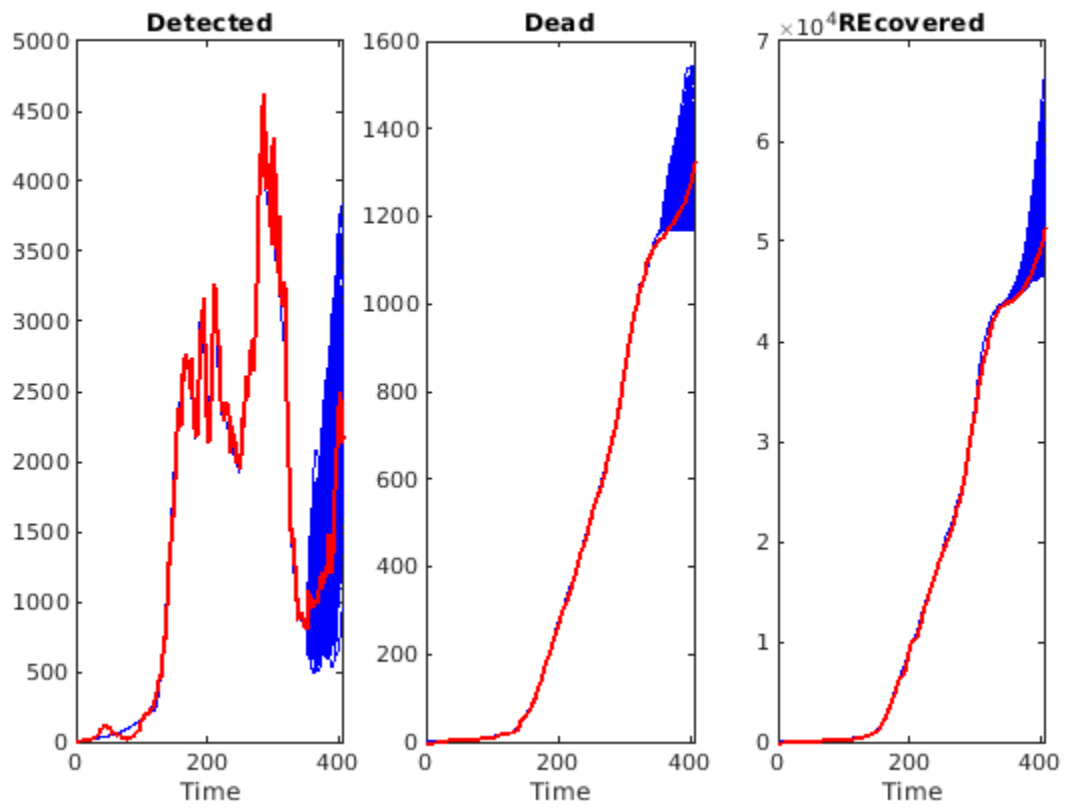






## 10.4. Uncertainty analysys

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 data406 to the 436. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

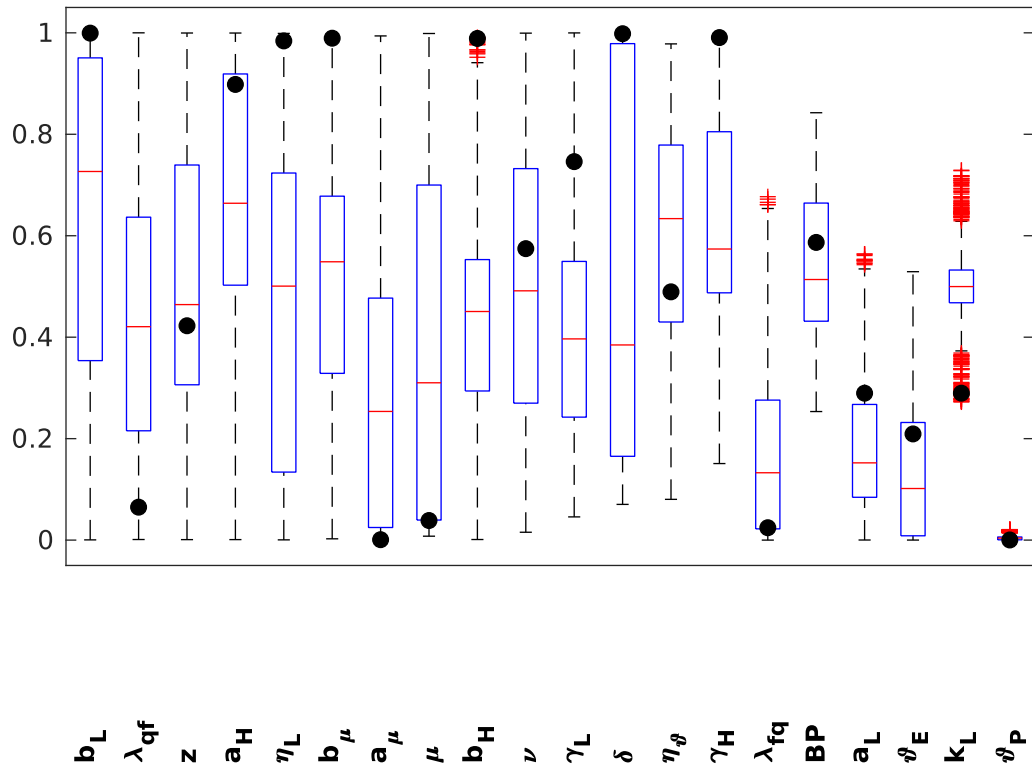
### 11.2. Estimated parameters with their intervals

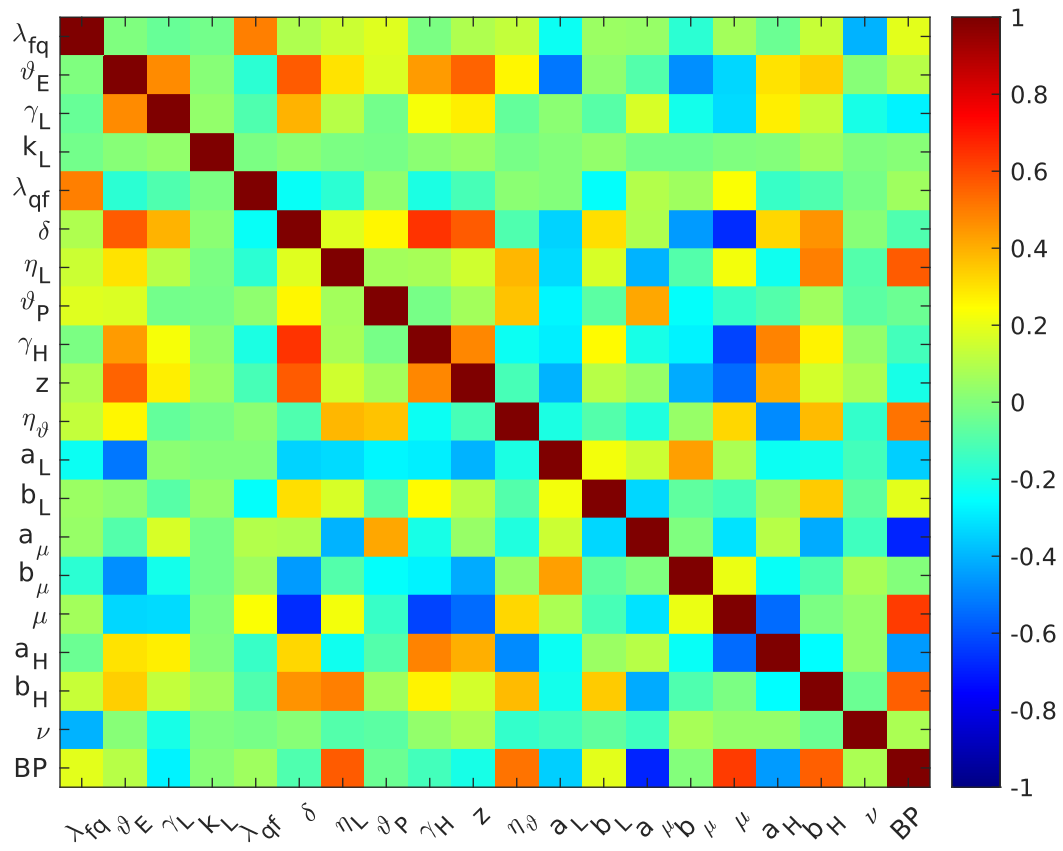
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

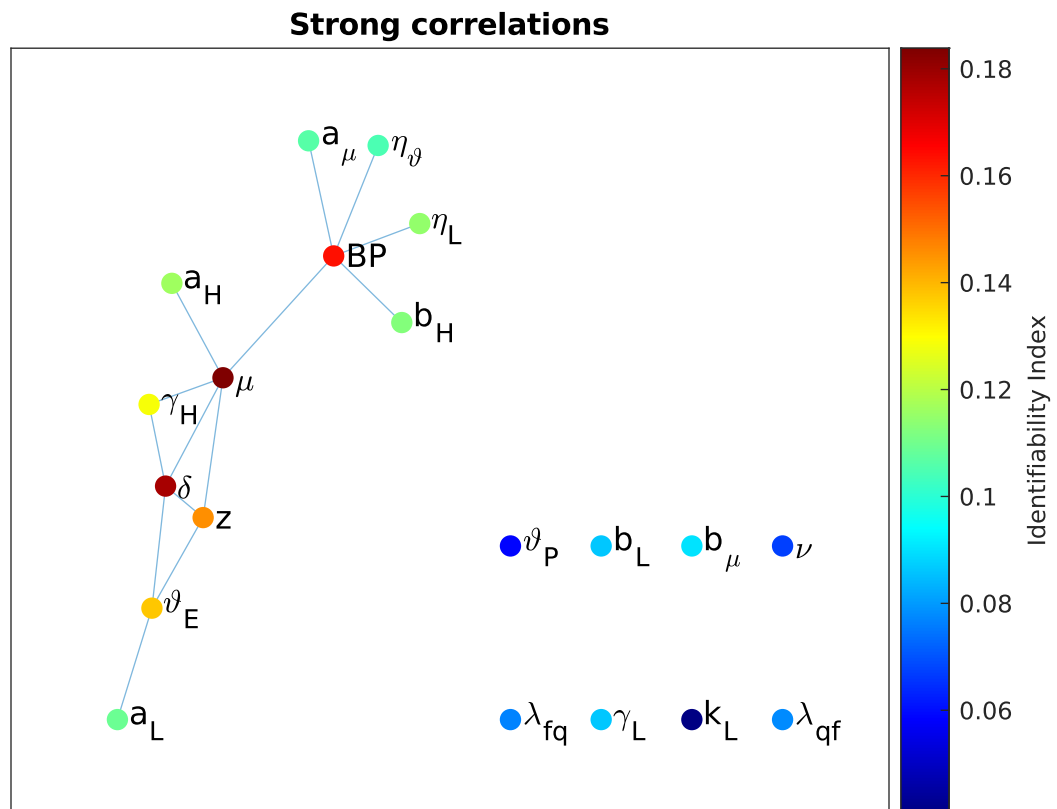
	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.0182'	'0.0362'	'0.1327'	'0.0244'	'0.0768'
\vartheta_E	'0.1948'	'0.3182'	'0.1017'	'0.2093'	'0.1376'
\gamma_L	'0.3397'	'0.967'	'0.3966'	'0.7461'	'0.0865'
k_L	'1.45'	'10'	'5.498'	'3.6066'	'0.0409'
\lambda_{qf}	'0.0643'	'0.1517'	'0.4207'	'0.0649'	'0.0778'
\delta	'0.0716'	'0.15'	'0.0577'	'0.1497'	'0.1782'
\eta_L	'0.2797'	'1'	'0.5007'	'0.9841'	'0.1148'
\vartheta_P	'0'	'0.0005'	'0.004'	'0.0002'	'0.0592'
\gamma_H	'0.1053'	'1'	'0.5738'	'0.9906'	'0.1291'
z	'8.8763'	'22.6343'	'13.9278'	'12.6765'	'0.1455'
\eta_{\vartheta}	'0.3639'	'0.8996'	'0.6337'	'0.4894'	'0.1051'
a_L	'3.106'	'5.1693'	'3.1316'	'5.0543'	'0.1093'
b_L	'6.8133'	'15'	'11.1731'	'14.9916'	'0.0863'
a_{\mu}	'1'	'12.97'	'4.5507'	'1.0116'	'0.1064'
b_{\mu}	'3.66'	'15'	'8.6812'	'14.8514'	'0.0902'
\mu	'0.0035'	'0.076'	'0.3101'	'0.0386'	'0.1839'
a_H	'2.4097'	'15'	'10.2964'	'13.5757'	'0.1165'
b_H	'4.5068'	'15'	'7.3089'	'14.8447'	'0.1128'
\nu	'285.3431'	'407.2045'	'245.7025'	'287.2662'	'0.0675'
BP	'395.8301'	'405.0189'	'390.5'	'395.8379'	'0.1635'

### 11.3. Identifiability analysis



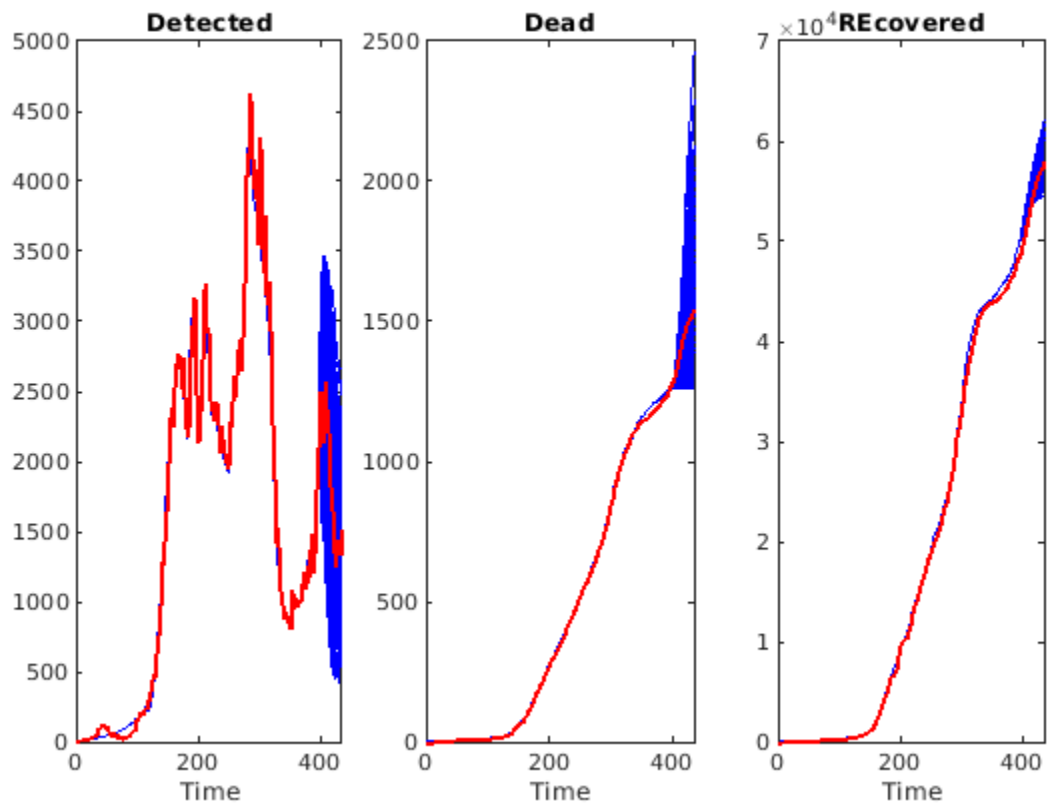






## 11.4. Uncertainty analysys

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 data436 to the 469. The status of the validation is: COMPLETED.

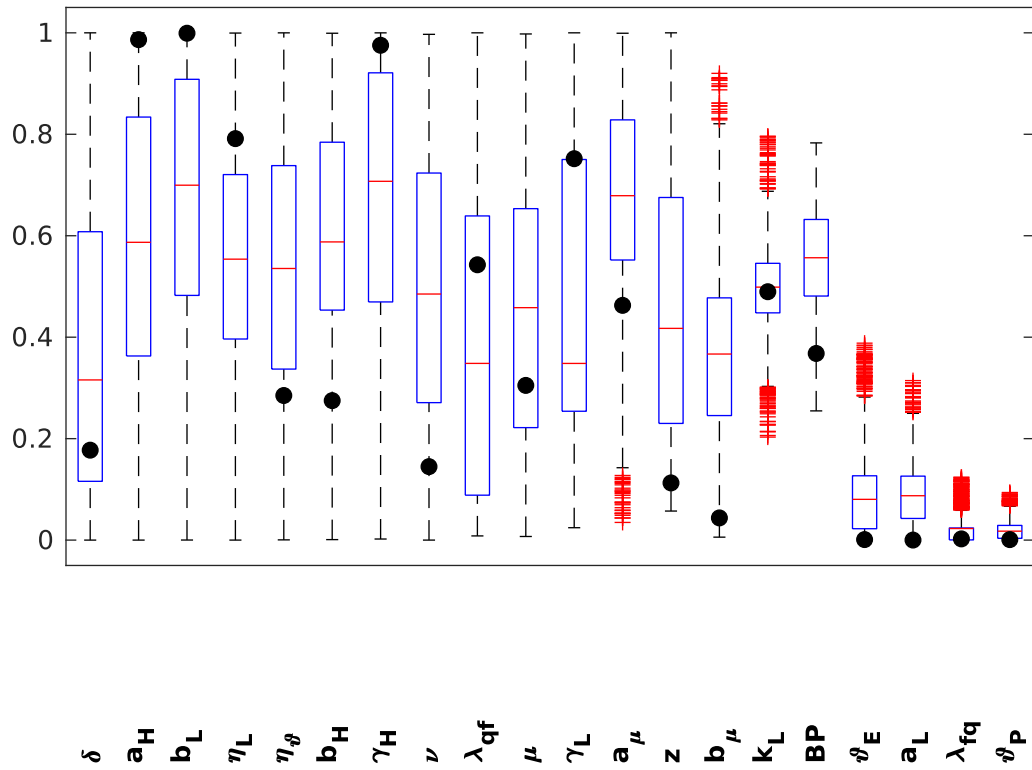
The number of estimations needed to perform the validation was1000.

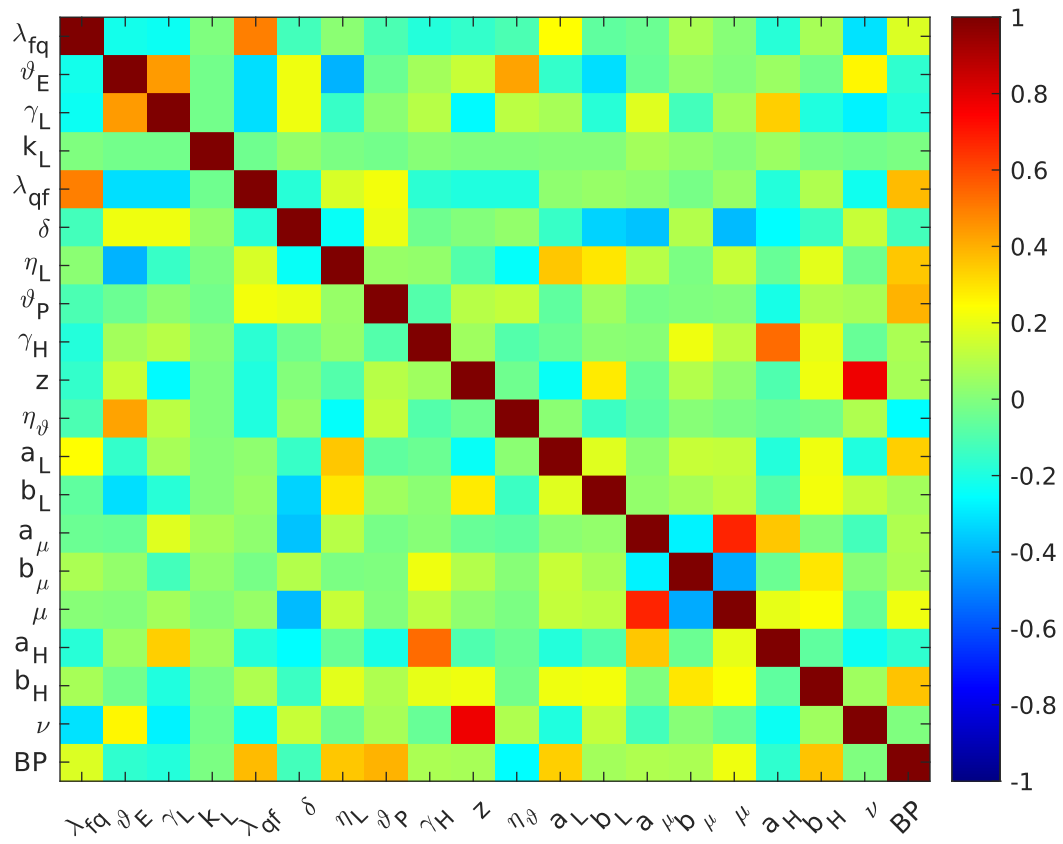
### 12.2. Estimated parameters with their intervals

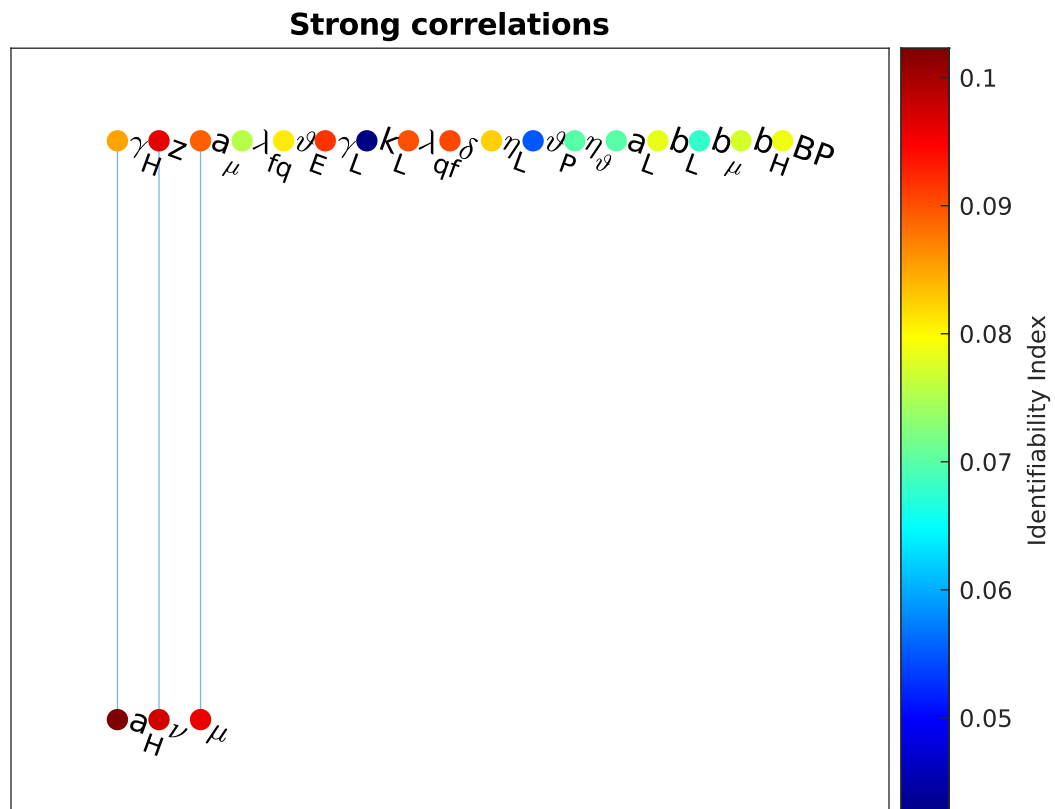
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0073'	'0.0384'	'0.0228'	'0.0024'	'0.0757'
$\vartheta_E$	'0.0663'	'0.0944'	'0.0803'	'0.001'	'0.0809'
$\gamma_L$	'0.3252'	'0.3714'	'0.3483'	'0.7519'	'0.0917'
$k_L$	'5.3756'	'5.6008'	'5.4882'	'5.4068'	'0.0426'
$\lambda_{qf}$	'0.3247'	'0.3719'	'0.3483'	'0.5428'	'0.09'
$\delta$	'0.0436'	'0.0511'	'0.0474'	'0.0266'	'0.0906'
$\eta_L$	'0.5332'	'0.5745'	'0.5538'	'0.7914'	'0.0827'
$\vartheta_P$	'0.0113'	'0.0239'	'0.0176'	'0.001'	'0.055'
$\gamma_H$	'0.6862'	'0.7284'	'0.7073'	'0.9755'	'0.0852'
$z$	'11.8508'	'13.192'	'12.5214'	'3.3816'	'0.0962'
$\eta_{\vartheta}$	'0.5159'	'0.555'	'0.5354'	'0.285'	'0.07'
$a_L$	'2.0801'	'2.3692'	'2.2246'	'1.0012'	'0.0699'
$b_L$	'10.5099'	'11.0795'	'10.7947'	'14.9888'	'0.0784'
$a_{\mu}$	'10.2341'	'10.7759'	'10.505'	'7.4787'	'0.089'
$b_{\mu}$	'5.8991'	'6.371'	'6.1351'	'1.6126'	'0.0679'
$\mu$	'0.4355'	'0.4809'	'0.4582'	'0.305'	'0.0958'
$a_H$	'8.8955'	'9.5417'	'9.2186'	'14.8118'	'0.1023'
$b_H$	'8.9708'	'9.4881'	'9.2294'	'4.8493'	'0.0773'
$\nu$	'231.7381'	'253.3507'	'242.5444'	'72.4212'	'0.0974'
BP	'434.9779'	'436.0221'	'435.5'	'425.4996'	'0.0789'

### 12.3. Identifiability analysis

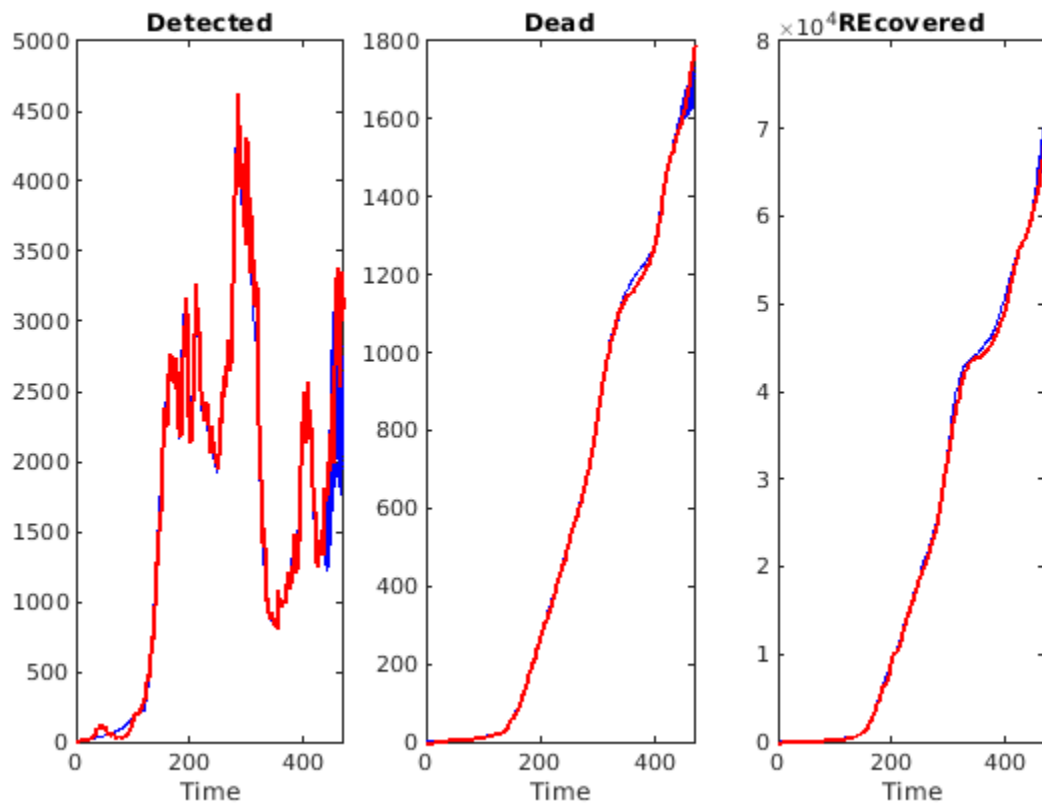






## 12.4. Uncertainty analysys

N=500



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## Chapter 13. Extension number13

### 13.1. Basic information

The extension to be validated consists of the time series from the data469 to the 558. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

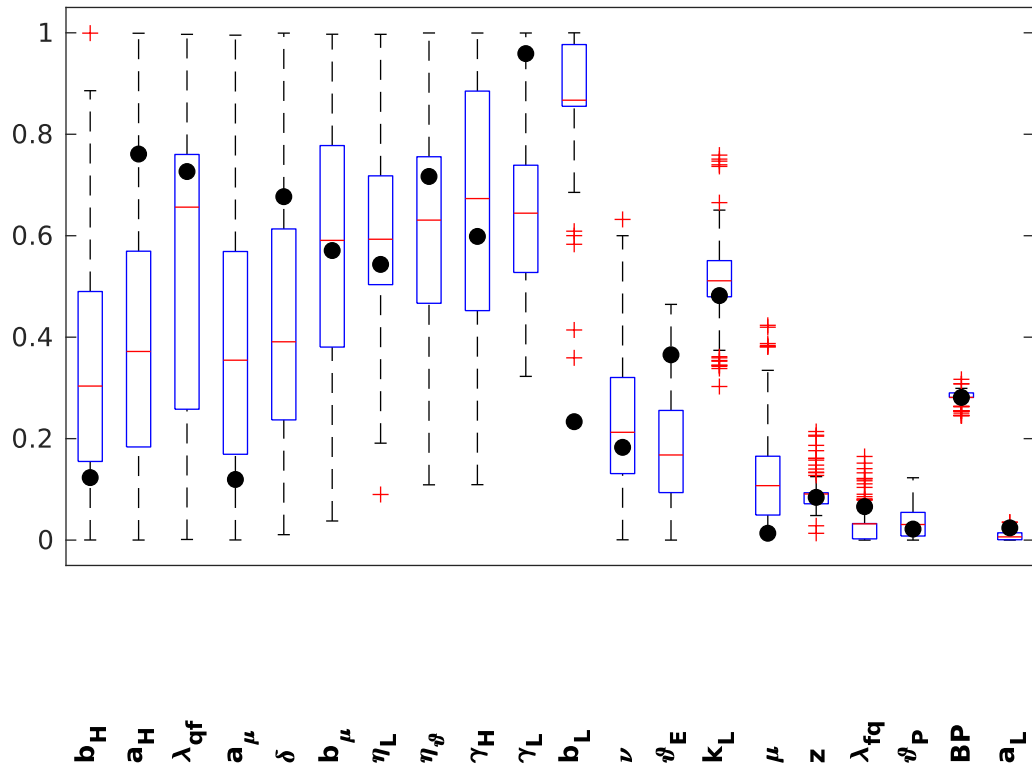
### 13.2. Estimated parameters with their intervals

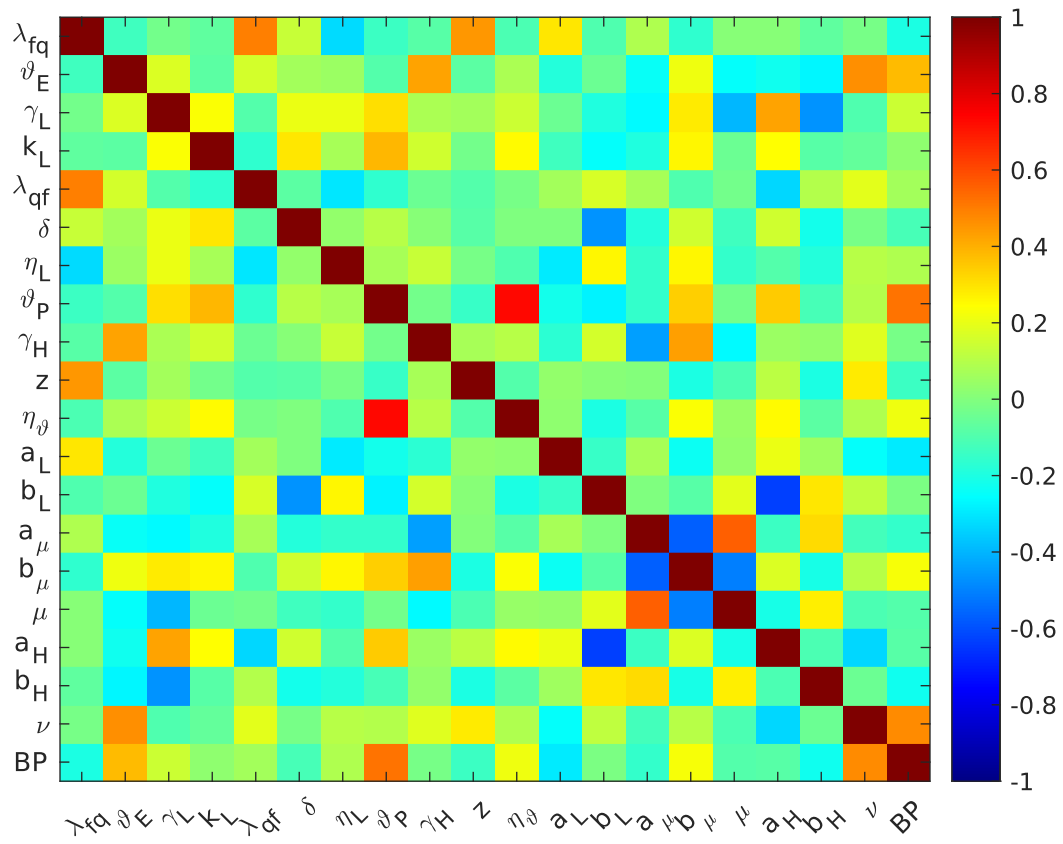
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

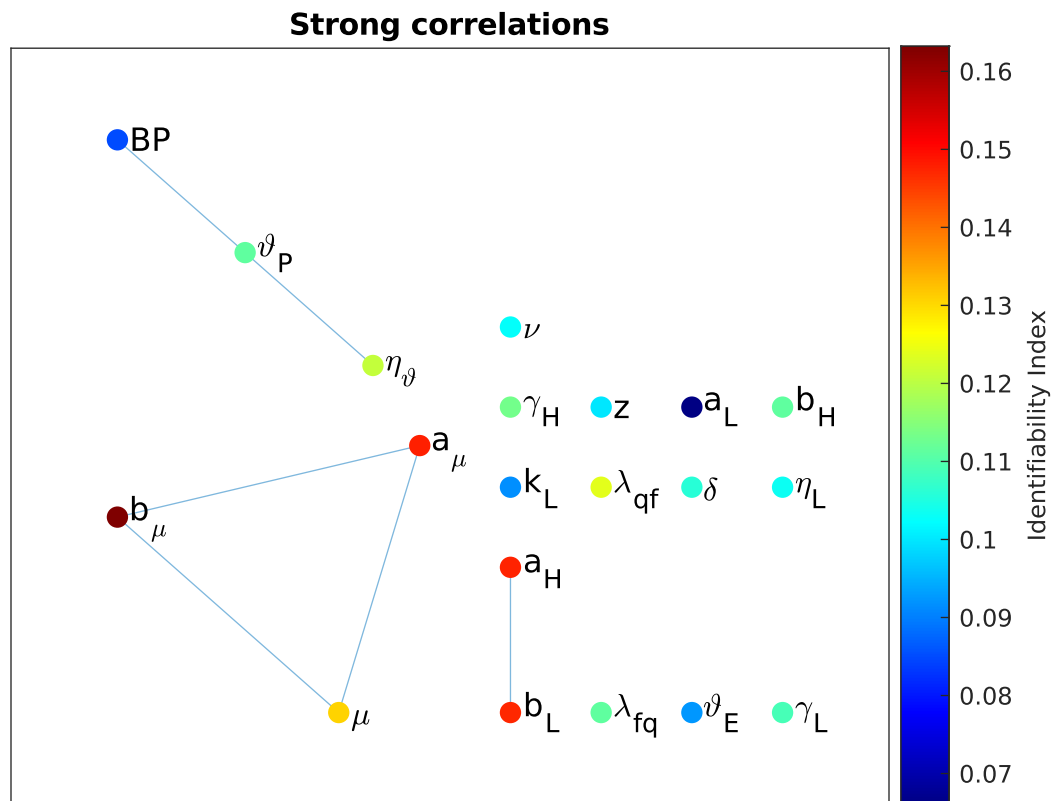
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.1003'	'0.0326'	'0.066'	'0.1114'
$\vartheta_E$	'0.1453'	'0.1903'	'0.1678'	'0.3653'	'0.0926'
$\gamma_L$	'0.6086'	'0.6801'	'0.6443'	'0.959'	'0.109'
$k_L$	'5.3388'	'5.862'	'5.6004'	'5.3379'	'0.0916'
$\lambda_{qf}$	'0.5913'	'0.7213'	'0.6563'	'0.7265'	'0.1239'
$\delta$	'0.051'	'0.0662'	'0.0586'	'0.1015'	'0.1061'
$\eta_L$	'0.5497'	'0.6343'	'0.592'	'0.5434'	'0.1036'
$\vartheta_P$	'0.0226'	'0.0389'	'0.0308'	'0.0217'	'0.1114'
$\gamma_H$	'0.621'	'0.7255'	'0.6732'	'0.5986'	'0.1134'
$z$	'1.2941'	'4.1586'	'2.7263'	'2.5275'	'0.1'
$\eta_{\vartheta}$	'0.5829'	'0.6787'	'0.6308'	'0.7168'	'0.1208'
$a_L$	'1'	'1.1896'	'1.0918'	'1.3372'	'0.0661'
$b_L$	'12.2298'	'14.0409'	'13.1353'	'4.2679'	'0.1471'
$a_{\mu}$	'5.2605'	'6.669'	'5.9648'	'2.6729'	'0.1479'
$b_{\mu}$	'8.5166'	'10.0268'	'9.2717'	'8.9913'	'0.1632'
$\mu$	'0.0697'	'0.1454'	'0.1075'	'0.0135'	'0.1306'
$a_H$	'5.3835'	'7.0279'	'6.2057'	'11.654'	'0.1475'
$b_H$	'4.6235'	'5.8785'	'5.251'	'2.7252'	'0.1113'
$\nu$	'87.1108'	'125.3968'	'106.2538'	'91.4212'	'0.1028'
BP	'466.995'	'468.005'	'467.5'	'467.5'	'0.0854'



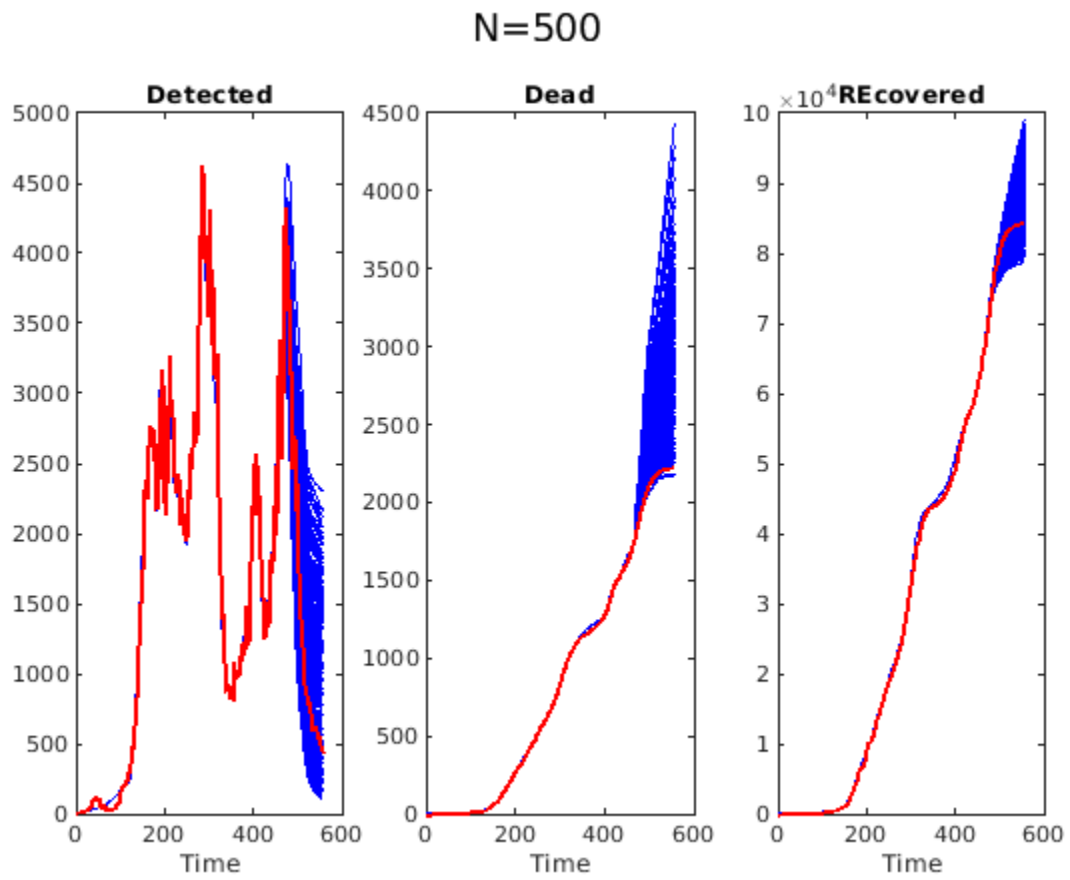
### 13.3. Identifiability analysis







### 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 data558 to the 720. The status of the validation is: COMPLETED.

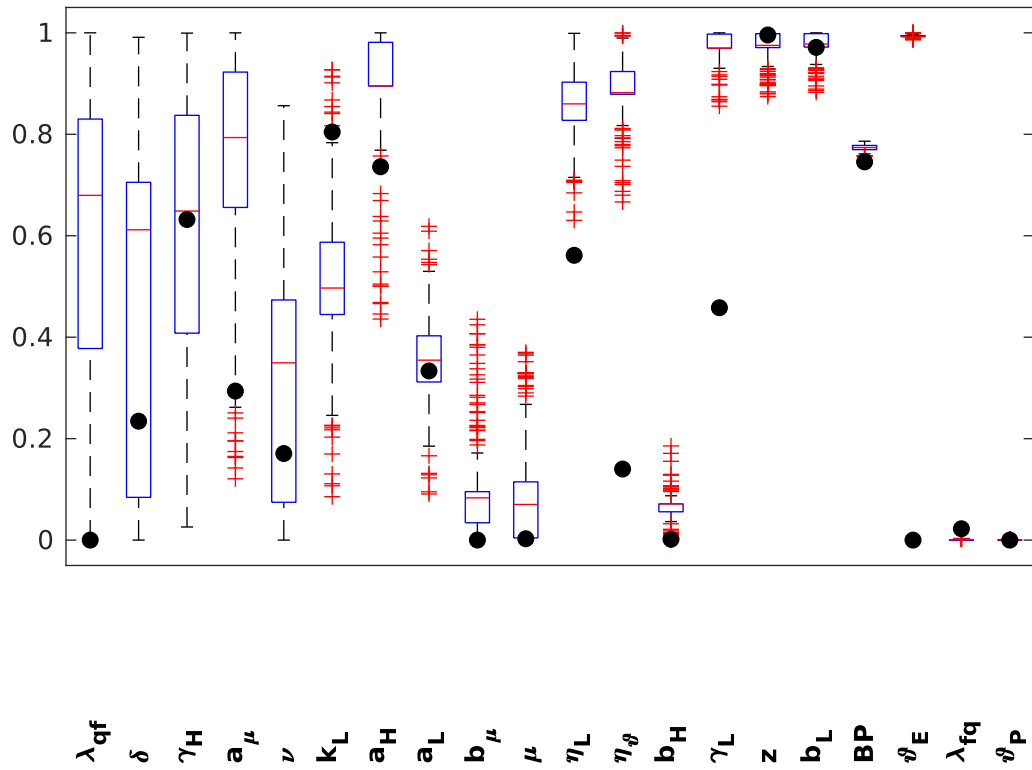
The number of estimations needed to perform the validation was1000.

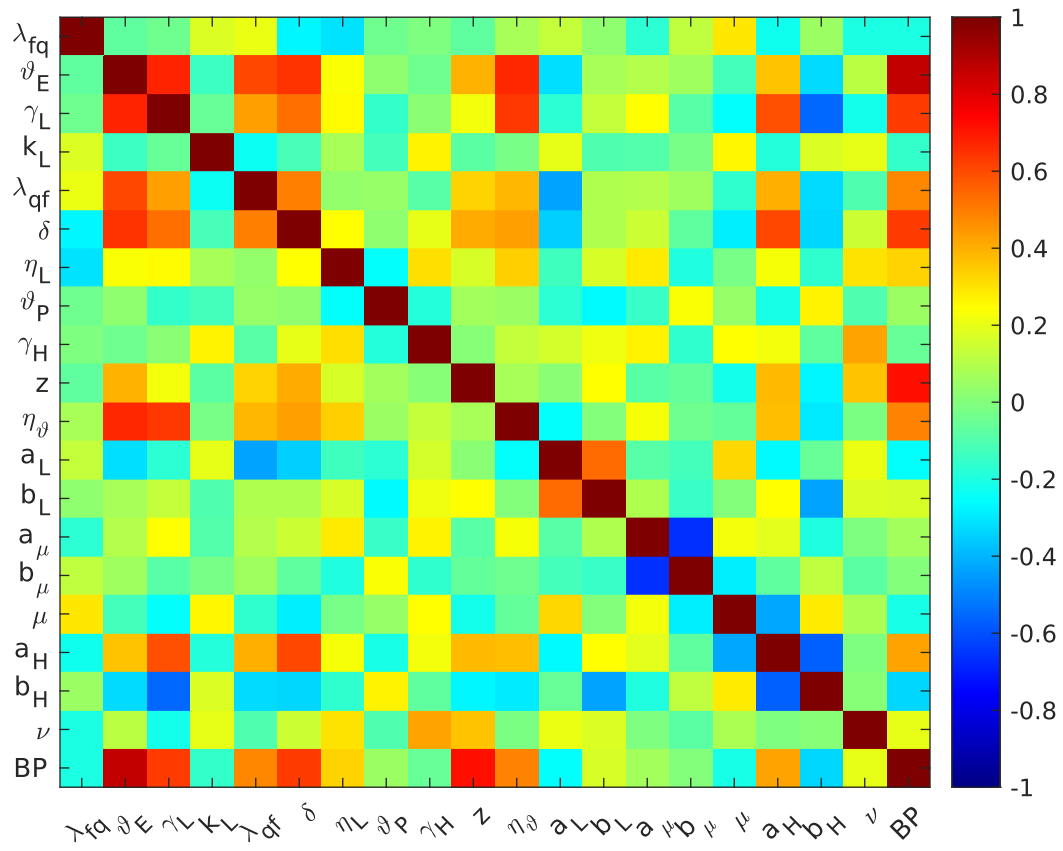
### 14.2. Estimated parameters with their intervals

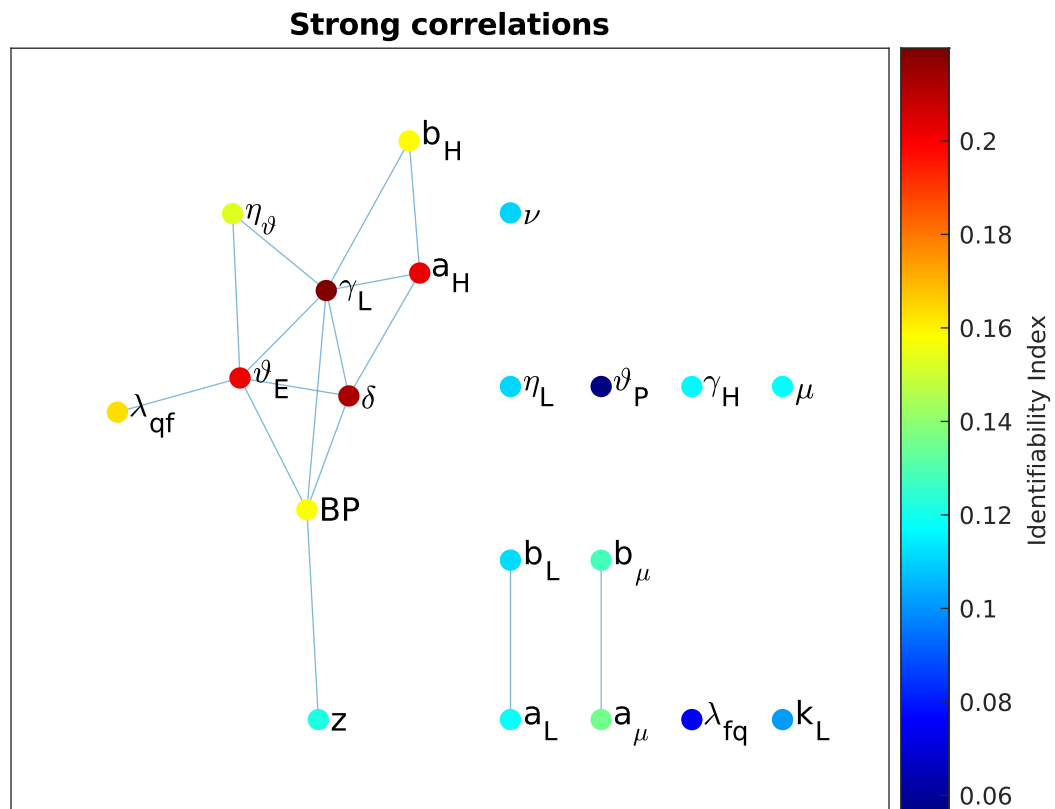
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0322'	'0.0006'	'0.0223'	'0.0744'
$\vartheta_E$	'0.9171'	'1'	'0.9929'	'0'	'0.2019'
$\gamma_L$	'0.9066'	'1'	'0.9696'	'0.4581'	'0.2198'
$k_L$	'5.0833'	'5.8611'	'5.4722'	'8.2403'	'0.1012'
$\lambda_{qf}$	'0.616'	'0.7432'	'0.6796'	'0'	'0.1635'
$\delta$	'0.0825'	'0.1011'	'0.0918'	'0.0352'	'0.2122'
$\eta_L$	'0.8243'	'0.8952'	'0.8597'	'0.5614'	'0.1108'
$\vartheta_P$	'0'	'0.0024'	'0.0003'	'0'	'0.0564'
$\gamma_H$	'0.595'	'0.7023'	'0.6486'	'0.632'	'0.1169'
$z$	'28.0651'	'30'	'29.2543'	'29.8728'	'0.1218'
$\eta_{\vartheta}$	'0.8353'	'0.9284'	'0.8818'	'0.1401'	'0.1532'
$a_L$	'5.5611'	'6.3705'	'5.9658'	'5.6686'	'0.1184'
$b_L$	'14.0449'	'15'	'14.6877'	'14.5983'	'0.1115'
$a_{\mu}$	'11.3101'	'12.8871'	'12.0986'	'5.1127'	'0.136'
$b_{\mu}$	'1.3457'	'2.991'	'2.1683'	'1.0011'	'0.1284'
$\mu$	'0.0261'	'0.1153'	'0.0707'	'0.0027'	'0.1171'
$a_H$	'12.6127'	'14.4451'	'13.5289'	'11.3032'	'0.2026'
$b_H$	'1.3156'	'2.6851'	'2.0004'	'1.0234'	'0.1591'
$\nu$	'150.546'	'198.9046'	'174.7253'	'85.3373'	'0.1101'
BP	'654.3525'	'656.6475'	'655.5'	'648.68'	'0.1576'

### 14.3. Identifiability analysis









## 14.4. Uncertainty analysys

N=500

