

# **Validation process for ARMENIA**

**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

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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 137. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

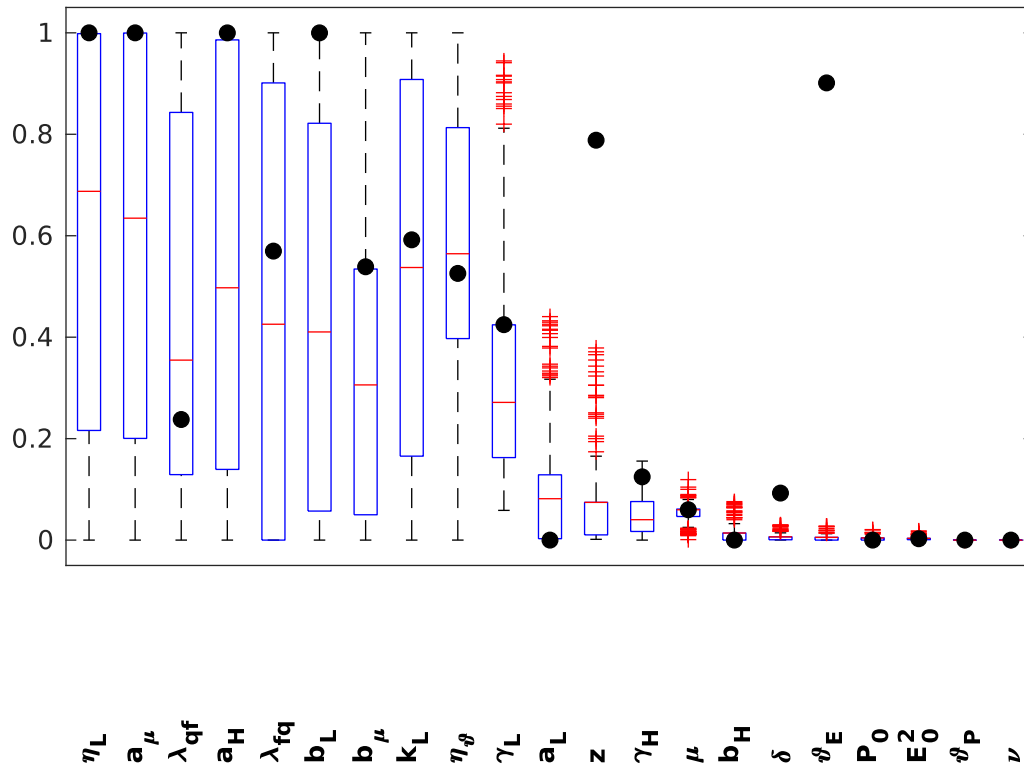
### 1.2. Estimated parameters with their intervals

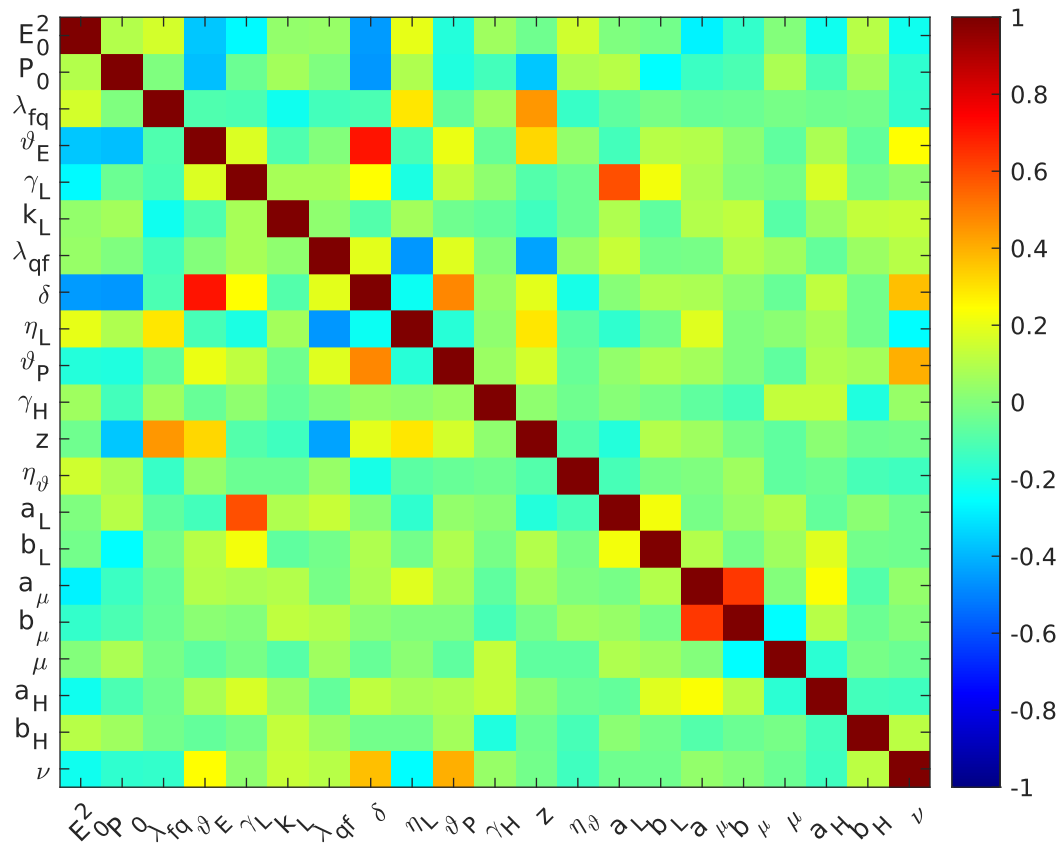
It was necessary to fix 0 parameters of 11 that could be fixed to complete validation.

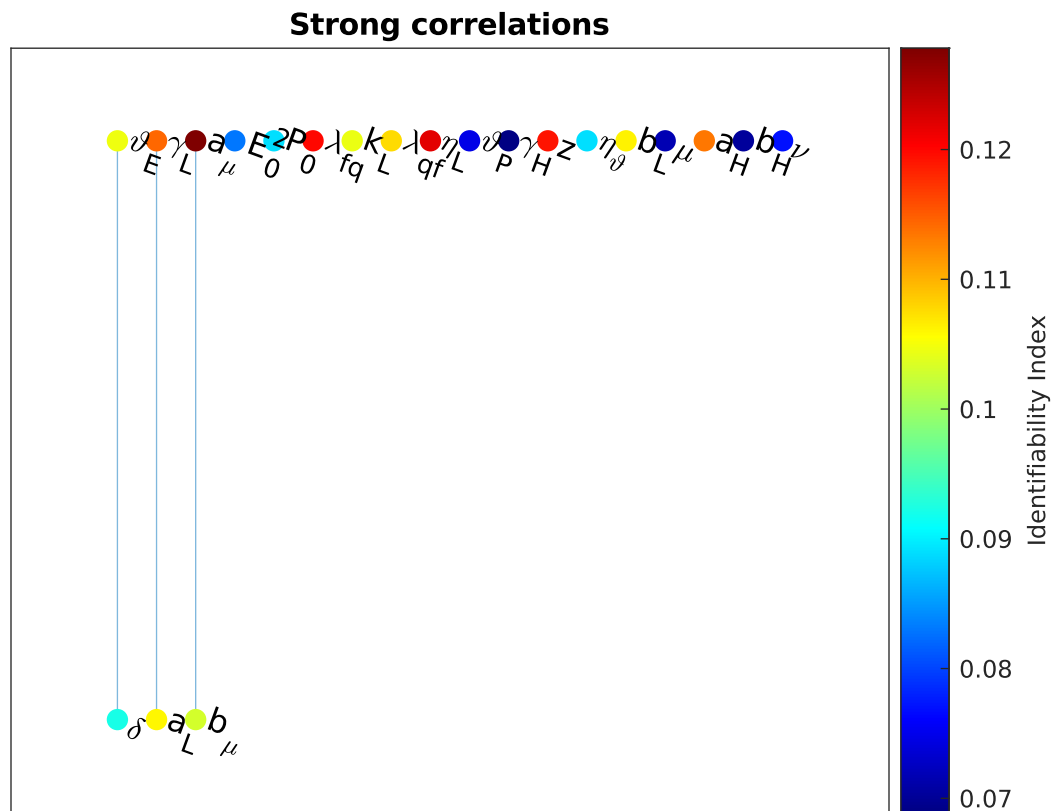
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
E^2_0	'4.9204'	'6.4084'	'7.0044'	'5.3565'	'0.083'
P_0	'0'	'0'	'1.7222'	'0'	'0.0891'
\lambda_{fq}	'0.5553'	'0.5778'	'0.4255'	'0.5697'	'0.1198'
\vartheta_E	'0.8951'	'0.9017'	'0.0054'	'0.9013'	'0.1047'
\gamma_L	'0.4067'	'0.4253'	'0.2715'	'0.4247'	'0.1145'
k_L	'1'	'10'	'5.8363'	'6.3276'	'0.1046'
\lambda_{qf}	'0.231'	'0.241'	'0.3548'	'0.2377'	'0.1076'
\delta	'0.0062'	'0.0179'	'0.001'	'0.0139'	'0.0922'
\eta_L	'0.9524'	'1'	'0.6875'	'1'	'0.1221'
\vartheta_P	'0'	'0'	'0'	'0'	'0.0749'
\gamma_H	'0.0653'	'0.1313'	'0.0402'	'0.1247'	'0.0689'
z	'23.2053'	'24.253'	'2.2318'	'23.6493'	'0.1192'
\eta_{\vartheta}	'0.2608'	'1'	'0.5645'	'0.5257'	'0.089'
a_L	'1'	'1.0478'	'2.1423'	'1.0001'	'0.1062'
b_L	'13.8709'	'15'	'6.7449'	'14.9992'	'0.1062'
a_{\mu}	'8.1488'	'15'	'9.8847'	'14.9997'	'0.1278'
b_{\mu}	'5.4423'	'14.0681'	'5.283'	'8.5435'	'0.1031'
\mu	'0.0548'	'0.1116'	'0.0598'	'0.0598'	'0.0719'
a_H	'9.4612'	'15'	'7.9637'	'14.9986'	'0.1135'
b_H	'1'	'3.8451'	'1.1952'	'1.0001'	'0.0705'
\nu	'0'	'0.0003'	'0.0001'	'0.0001'	'0.0771'

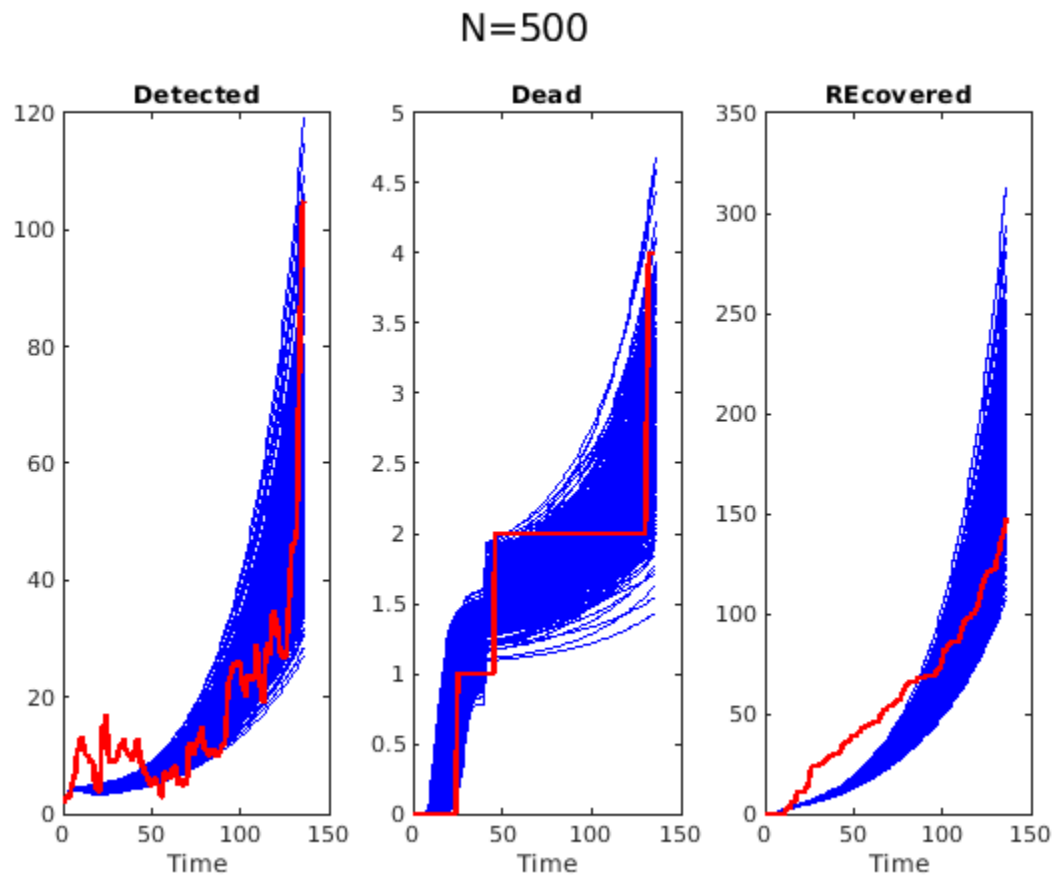
### 1.3. Identifiability analysys







## 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 data137 to the 198. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

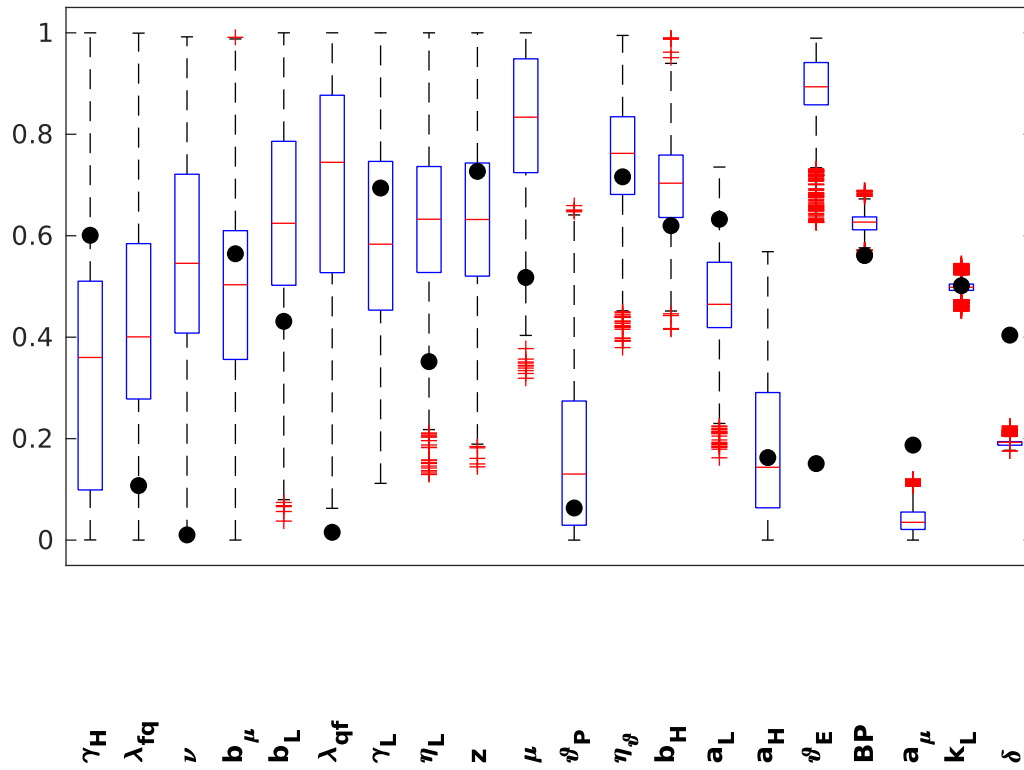
### 2.2. Estimated parameters with their intervals

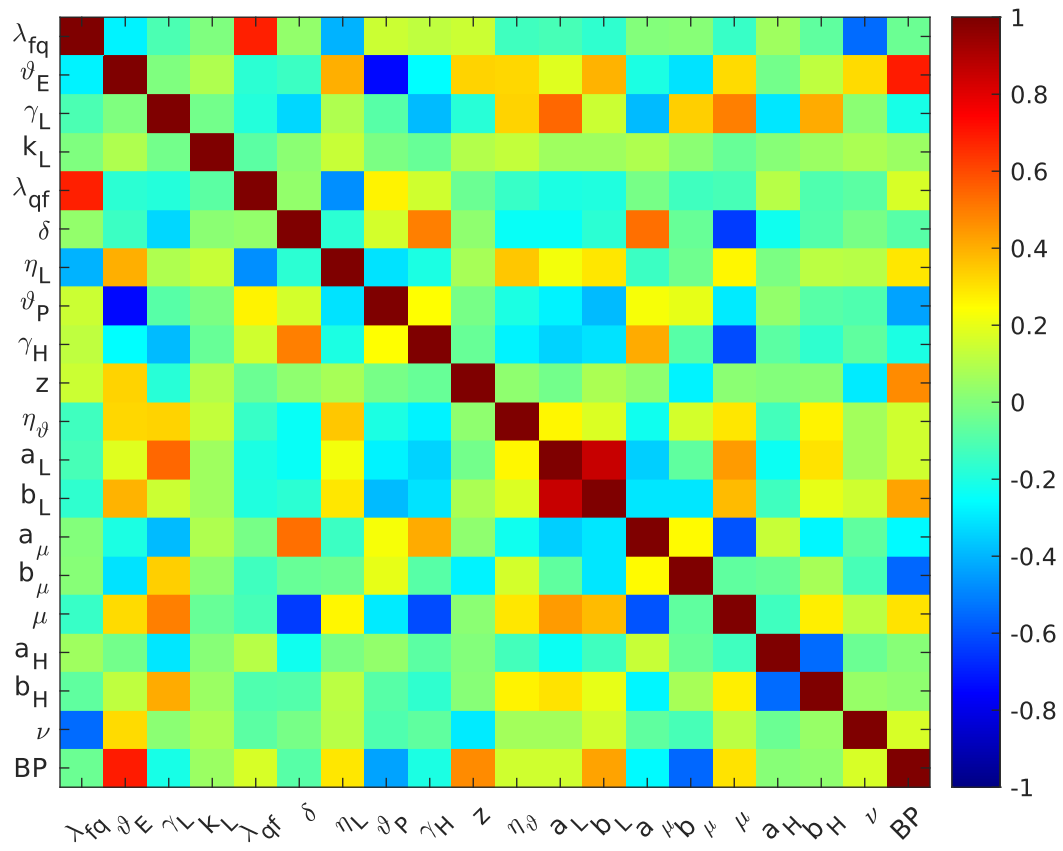
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

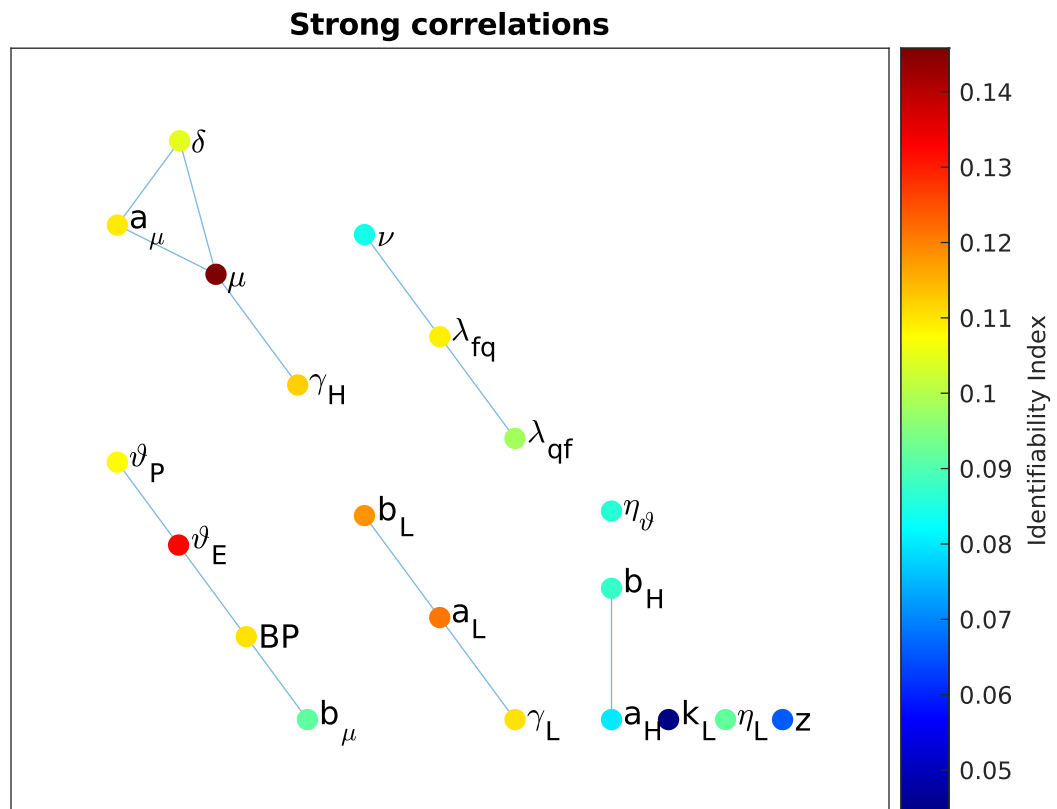
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.1051'	'0.1078'	'0.4006'	'0.1075'	'0.1092'
$\vartheta_E$	'0.1158'	'0.153'	'0.8936'	'0.1508'	'0.1325'
$\gamma_L$	'0.2917'	'0.7728'	'0.5833'	'0.694'	'0.1103'
$k_L$	'2.9698'	'7.998'	'5.4872'	'5.5138'	'0.0444'
$\lambda_{qf}$	'0.0148'	'0.0155'	'0.7445'	'0.0154'	'0.0985'
$\delta$	'0.0474'	'0.0609'	'0.0289'	'0.0606'	'0.1047'
$\eta_L$	'0.3191'	'0.3539'	'0.6325'	'0.3519'	'0.092'
$\vartheta_P$	'0.0408'	'0.068'	'0.1306'	'0.0633'	'0.1079'
$\gamma_H$	'0.3839'	'0.6447'	'0.36'	'0.6009'	'0.1125'
$z$	'21.6329'	'22.4103'	'18.9596'	'21.806'	'0.066'
$\eta_{\vartheta}$	'0.5062'	'0.7215'	'0.7624'	'0.7161'	'0.0862'
$a_L$	'8.2149'	'11.3684'	'7.5072'	'9.8544'	'0.1208'
$b_L$	'5.5946'	'9.7096'	'9.7435'	'7.0373'	'0.1181'
$a_{\mu}$	'3.3444'	'3.7641'	'1.491'	'3.6217'	'0.1095'
$b_{\mu}$	'8.4189'	'11.4823'	'8.0473'	'8.9026'	'0.0917'
$\mu$	'0.4392'	'0.6477'	'0.8335'	'0.5177'	'0.1458'
$a_H$	'2.9413'	'3.4184'	'3.011'	'3.2777'	'0.0802'
$b_H$	'8.3358'	'12.7169'	'10.8501'	'9.6777'	'0.0879'
$\nu$	'5.0292'	'7.3522'	'272.8309'	'5.125'	'0.0844'
BP	'110.7202'	'120.2446'	'124.4995'	'111.5'	'0.1103'

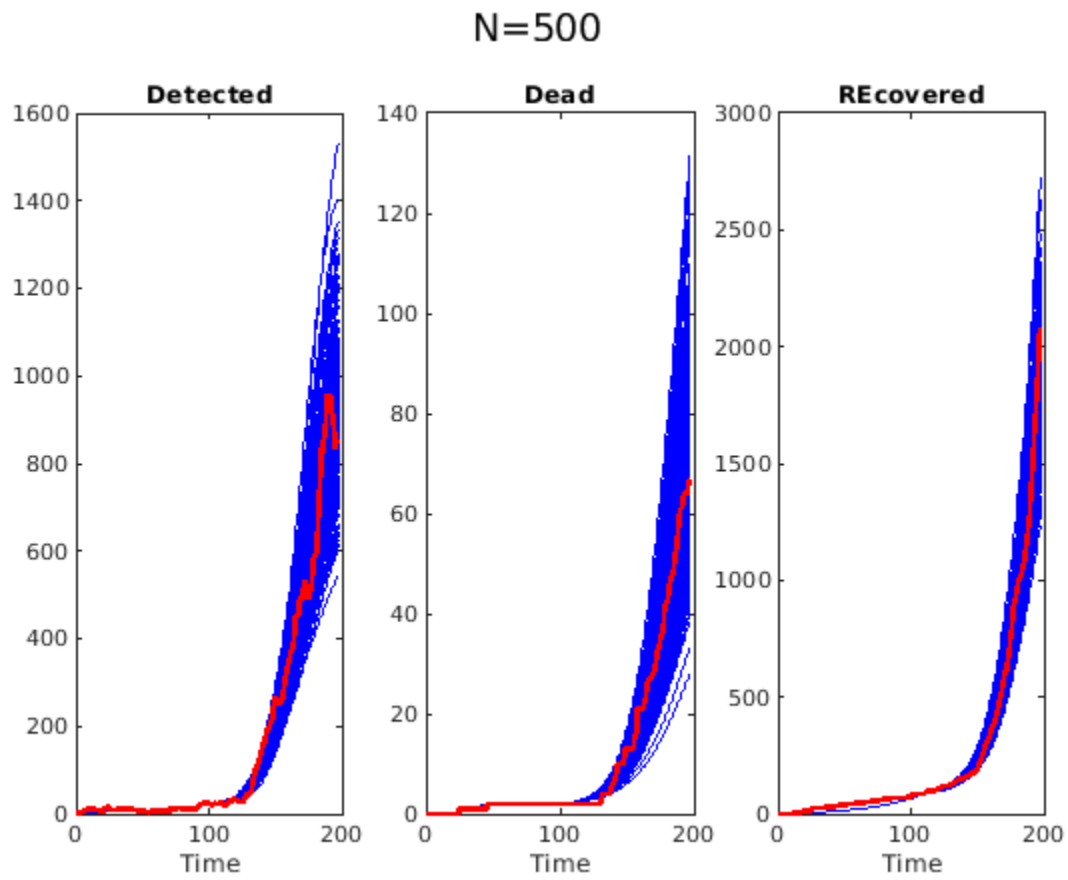
### 2.3. Identifiability analysis







## 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 data198 to the 238. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was2000.

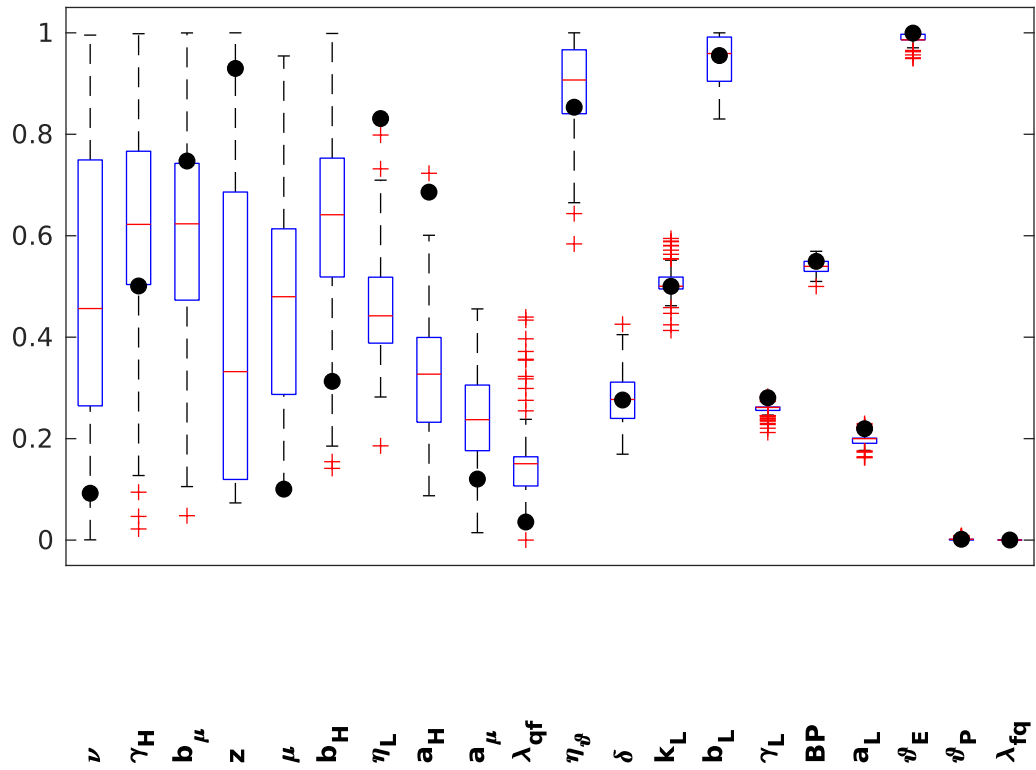
### 3.2. Estimated parameters with their intervals

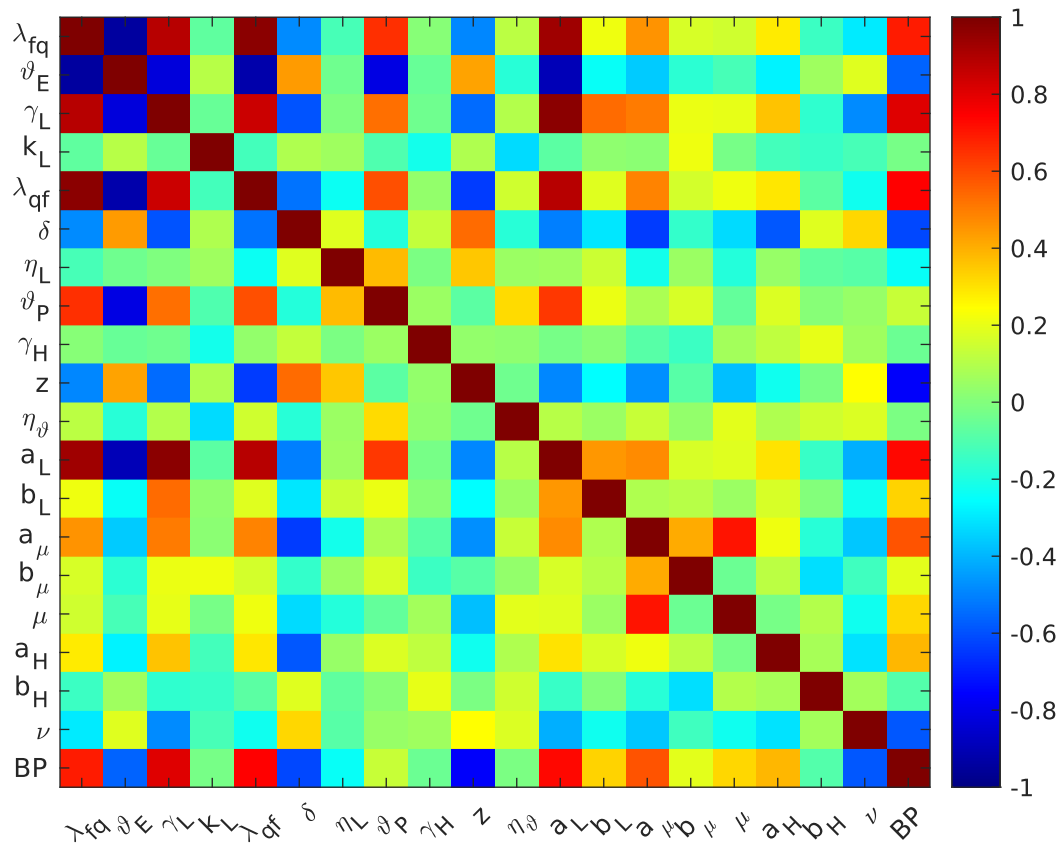
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

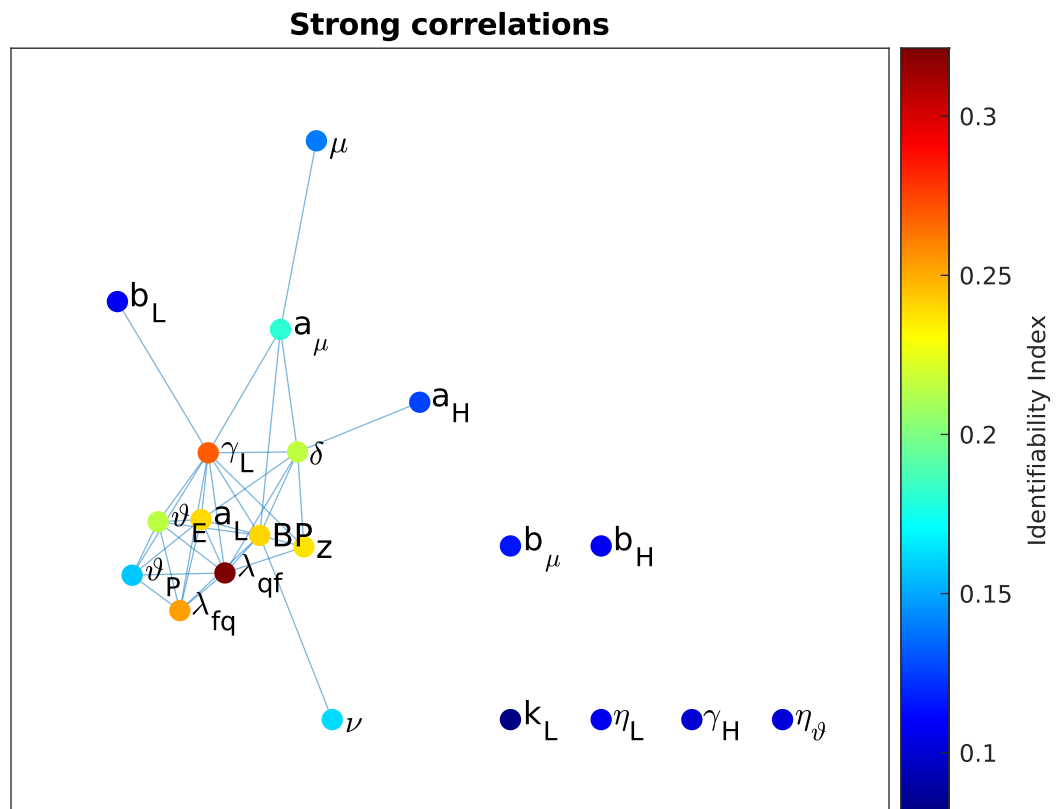
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0'	'0.0003'	'0'	'0.0001'	'0.2536'
$\vartheta_E$	'0.995'	'0.9996'	'0.9861'	'0.9994'	'0.215'
$\gamma_L$	'0.2393'	'0.2906'	'0.2615'	'0.2806'	'0.2693'
$k_L$	'1'	'8.3872'	'5.5039'	'5.5029'	'0.0813'
$\lambda_{qf}$	'0.0331'	'0.0412'	'0.1505'	'0.0357'	'0.3214'
$\delta$	'0.0212'	'0.0443'	'0.0416'	'0.0414'	'0.2158'
$\eta_L$	'0.7151'	'0.9004'	'0.4421'	'0.831'	'0.1074'
$\vartheta_P$	'0.0004'	'0.0032'	'0.0017'	'0.0017'	'0.1576'
$\gamma_H$	'0'	'0.8125'	'0.6224'	'0.501'	'0.1006'
$z$	'20.0481'	'28.009'	'9.9631'	'27.8942'	'0.2378'
$\eta_{\vartheta}$	'0.6014'	'0.956'	'0.907'	'0.8533'	'0.1015'
$a_L$	'3.1577'	'4.7681'	'3.7994'	'4.0735'	'0.2394'
$b_L$	'10.5088'	'14.4718'	'14.4287'	'14.3725'	'0.1084'
$a_{\mu}$	'1.0803'	'5.017'	'4.3237'	'2.6847'	'0.1807'
$b_{\mu}$	'6.3251'	'14.1275'	'9.7287'	'11.4619'	'0.1154'
$\mu$	'0.0854'	'0.2361'	'0.4798'	'0.1005'	'0.1403'
$a_H$	'6.9921'	'14.6605'	'5.5796'	'10.6037'	'0.127'
$b_H$	'1'	'13.096'	'9.9792'	'5.3812'	'0.1079'
$\nu$	'27.8334'	'60.6037'	'228.232'	'46.1806'	'0.1625'
BP	'192.1739'	'198.6432'	'191.5'	'192.4999'	'0.2403'

### 3.3. Identifiability analysys

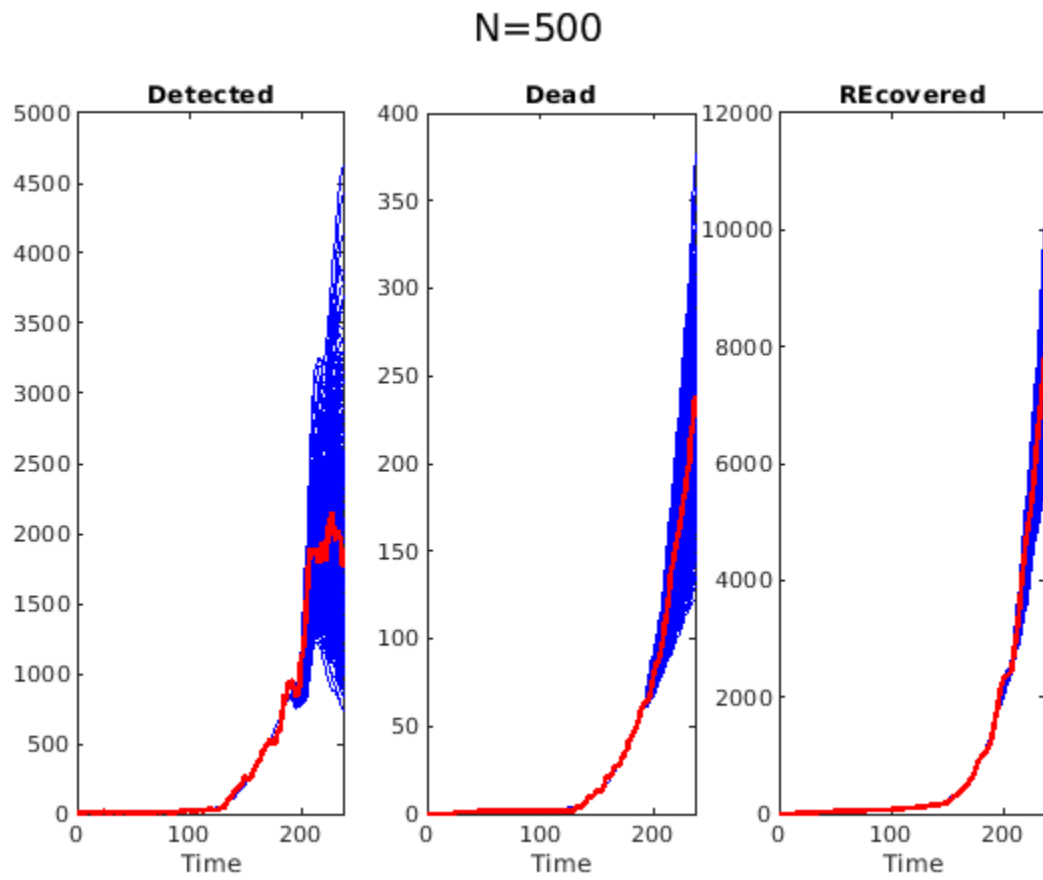








### 3.4. Uncertainty analysys



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## Chapter 4. Extension number4

### 4.1. Basic information

The extension to be validated consists of the time series from the data238 to the 267. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

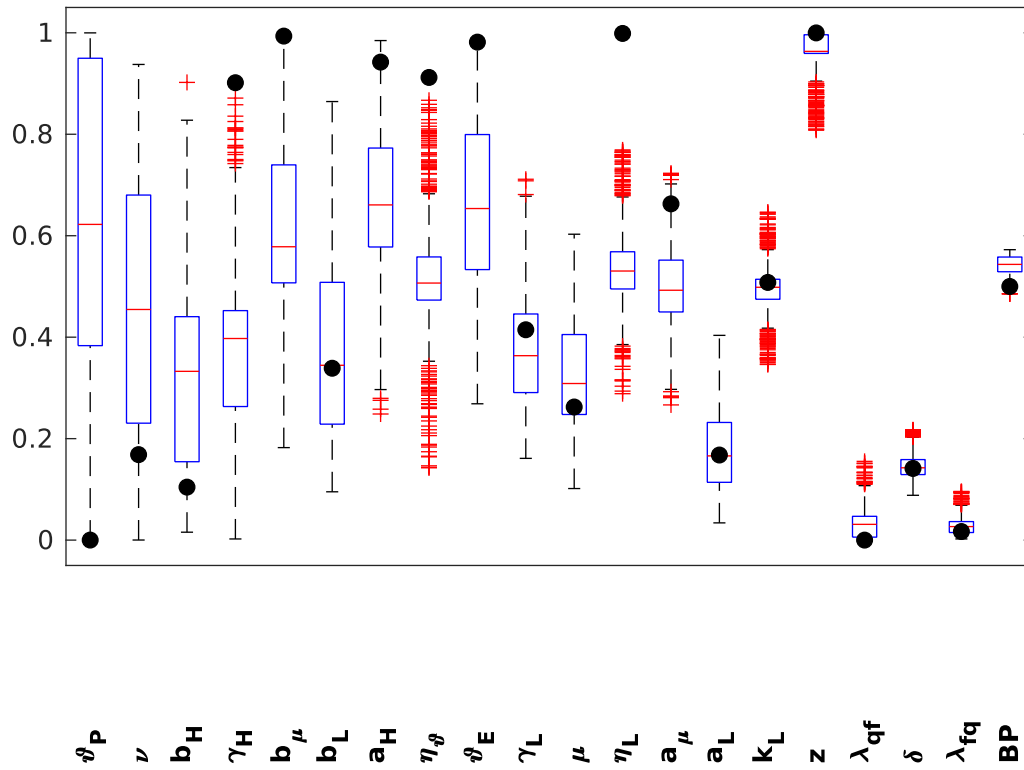
### 4.2. Estimated parameters with their intervals

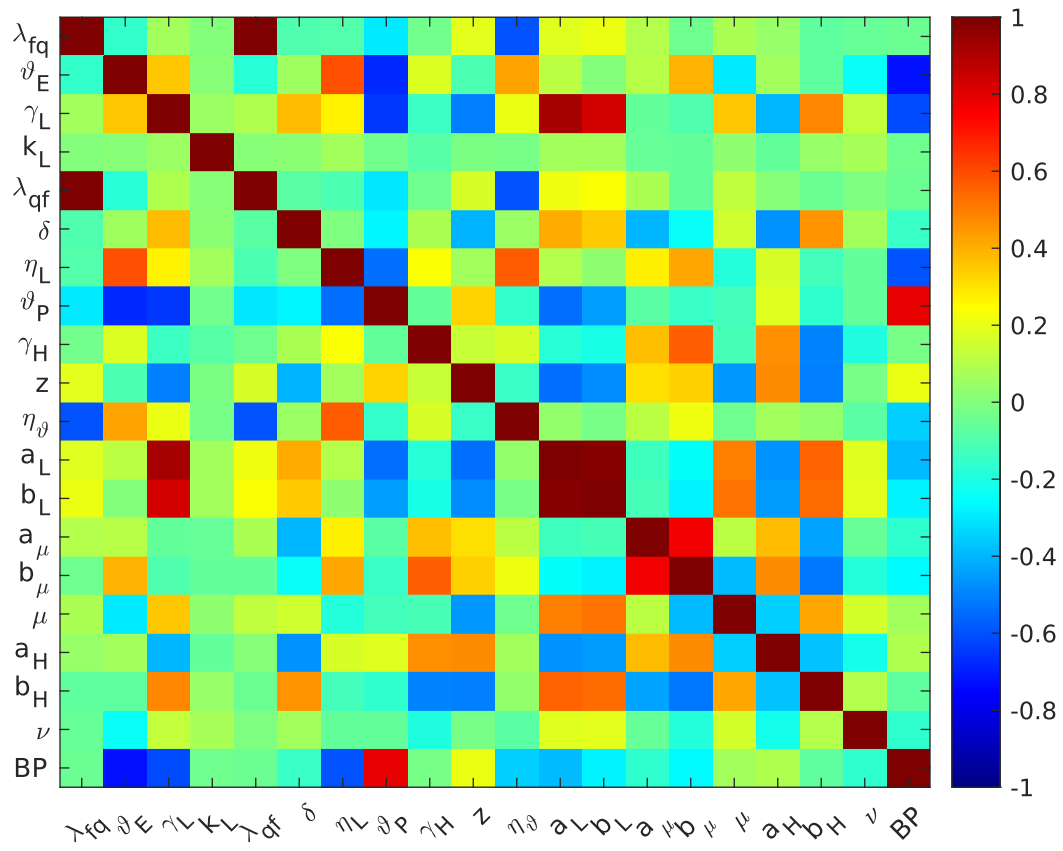
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

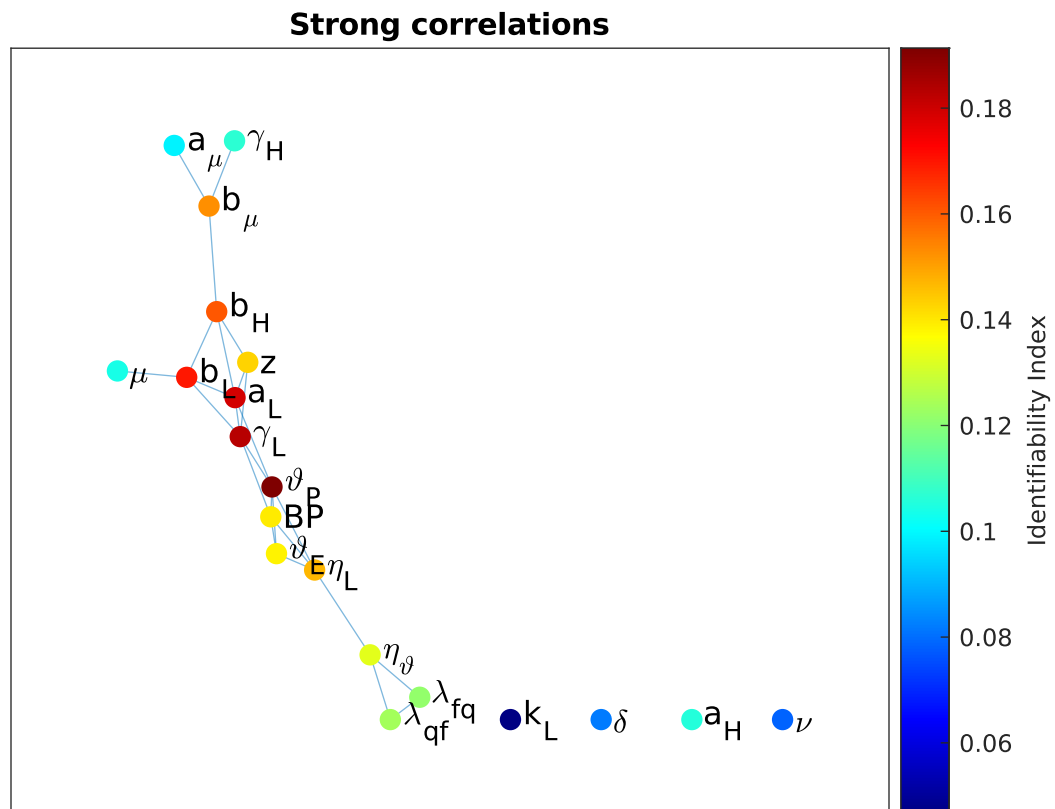
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0119'	'0.0175'	'0.0267'	'0.0169'	'0.1215'
$\vartheta_E$	'0.977'	'0.9821'	'0.6536'	'0.9816'	'0.1387'
$\gamma_L$	'0.2377'	'0.4269'	'0.3635'	'0.4146'	'0.183'
$k_L$	'1.18'	'10'	'5.4854'	'5.5714'	'0.0469'
$\lambda_{qf}$	'0'	'0'	'0.031'	'0'	'0.1241'
$\delta$	'0.002'	'0.0436'	'0.0214'	'0.0212'	'0.082'
$\eta_L$	'0.6222'	'1'	'0.5304'	'0.9987'	'0.147'
$\vartheta_P$	'0'	'0.0001'	'0.6223'	'0.0001'	'0.1913'
$\gamma_H$	'0.1263'	'0.9883'	'0.3974'	'0.9016'	'0.1068'
$z$	'24.9177'	'30'	'28.9009'	'29.9929'	'0.1431'
$\eta_{\vartheta}$	'0.3654'	'1'	'0.5067'	'0.912'	'0.1327'
$a_L$	'3.2399'	'4.545'	'3.3238'	'3.3479'	'0.1793'
$b_L$	'5.5211'	'10.9432'	'5.8245'	'5.7427'	'0.1697'
$a_{\mu}$	'4.2829'	'10.9649'	'7.8952'	'10.2796'	'0.0988'
$b_{\mu}$	'5.8616'	'15'	'9.0955'	'14.9089'	'0.1527'
$\mu$	'0.0977'	'0.5701'	'0.3087'	'0.2624'	'0.1042'
$a_H$	'2.2183'	'15'	'10.2502'	'14.1913'	'0.1058'
$b_H$	'1'	'14.44'	'5.6574'	'2.462'	'0.1605'
$\nu$	'64.5405'	'141.3607'	'227.3036'	'84.2447'	'0.0787'
BP	'230.5647'	'235.2085'	'235.5'	'232.4997'	'0.1399'

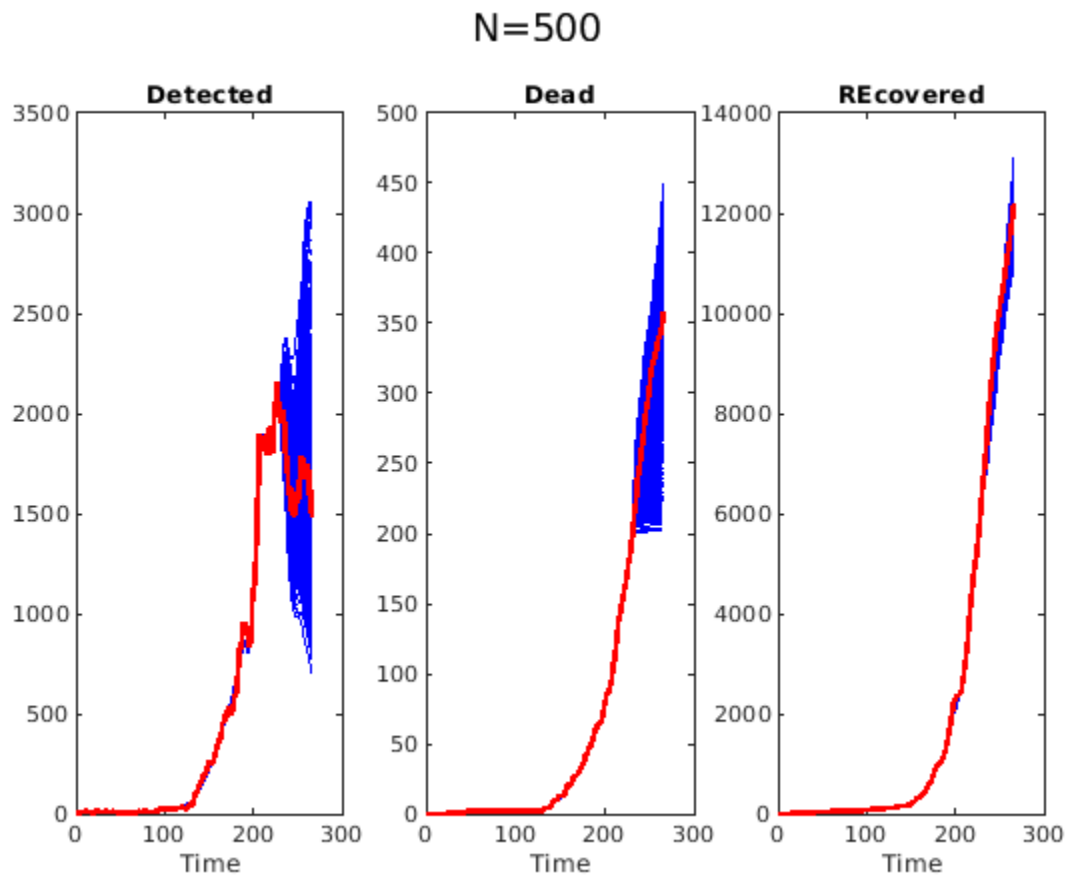
### 4.3. Identifiability analysys







#### 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 data267 to the 295. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

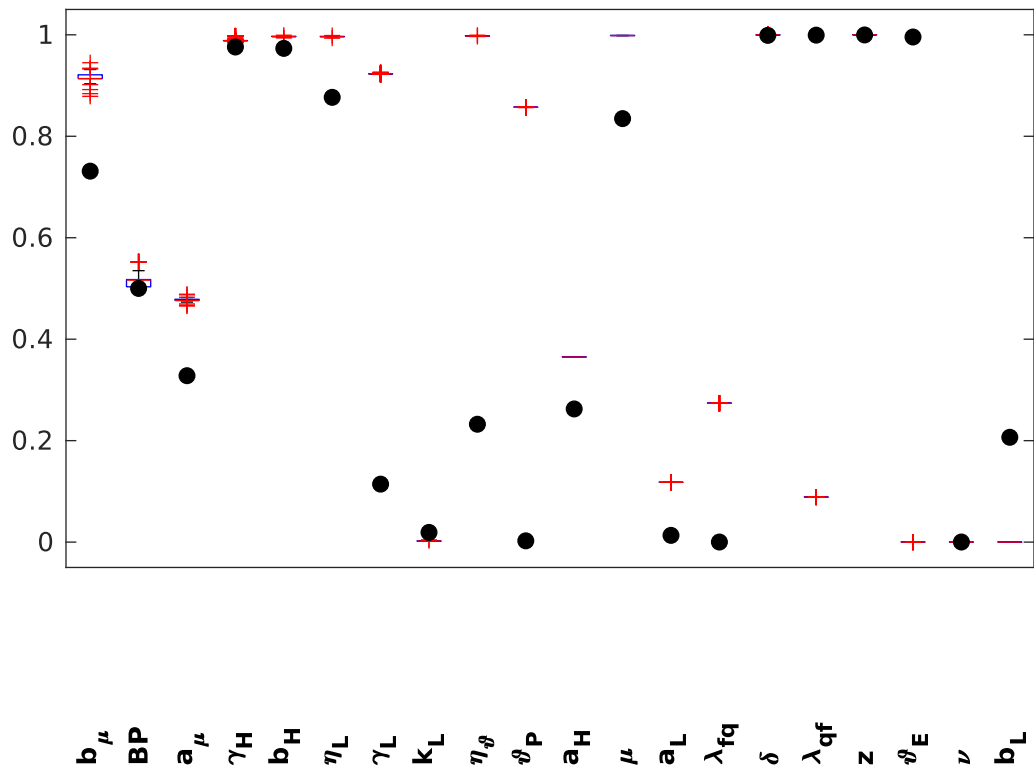
### 5.2. Estimated parameters with their intervals

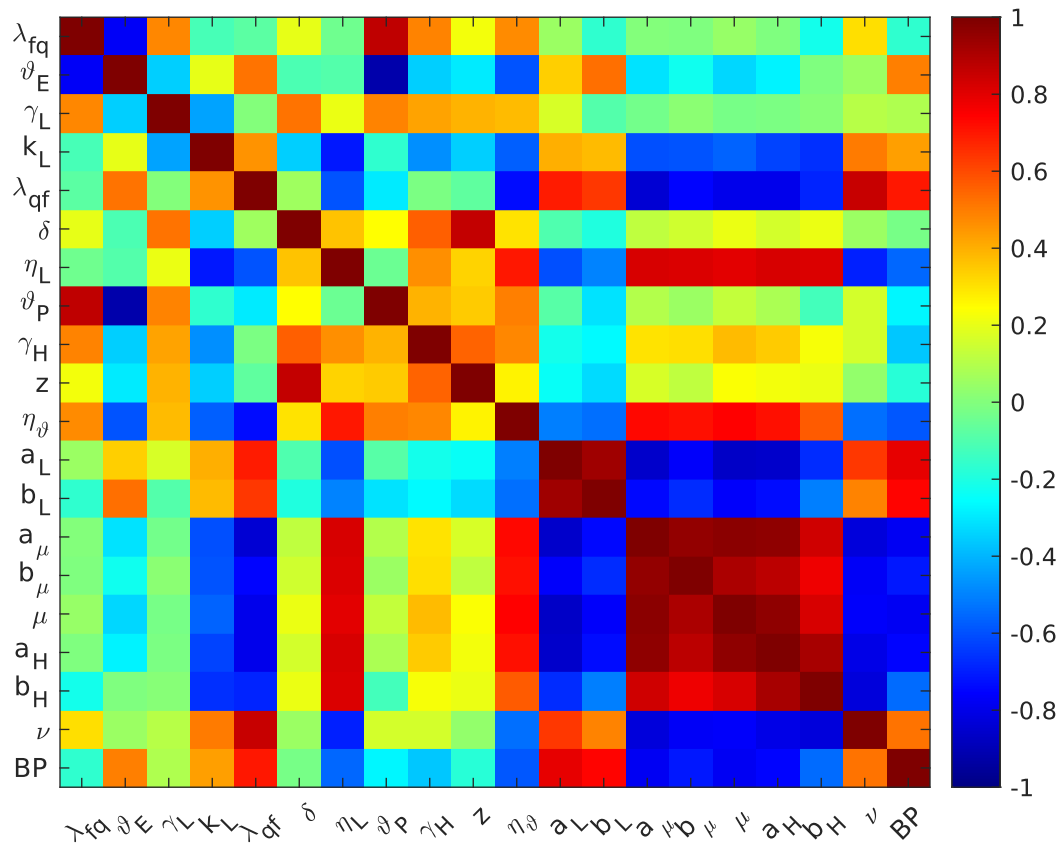
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

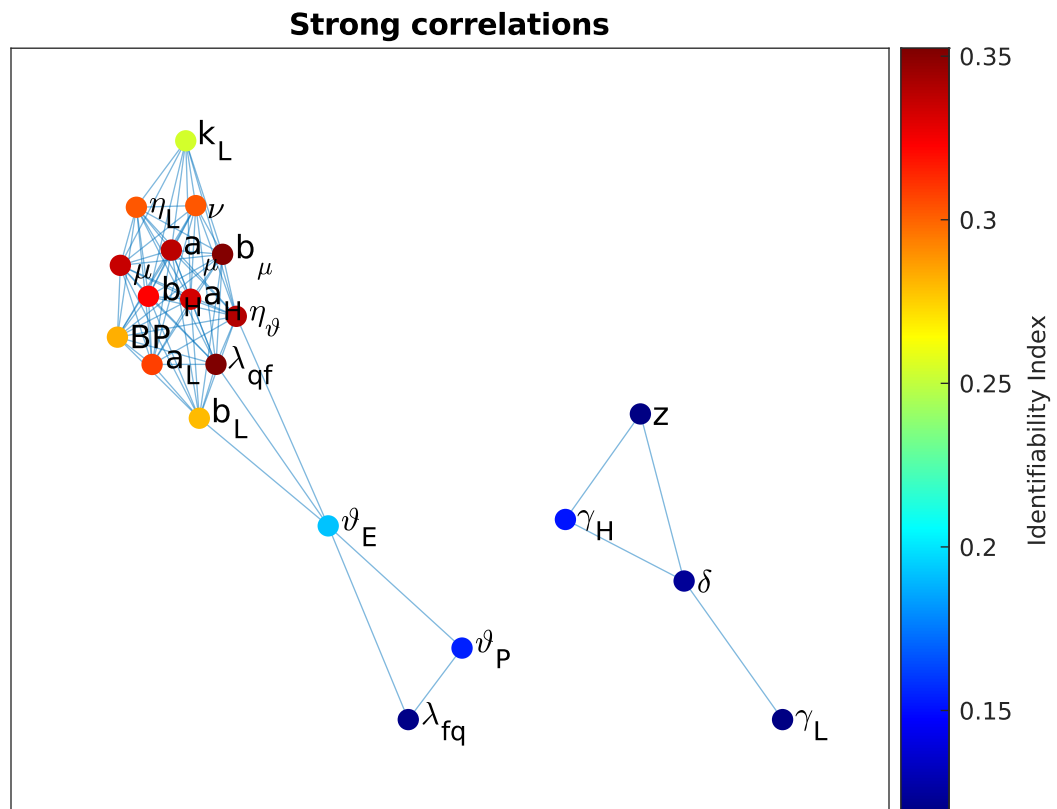
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.2618'	'0.2858'	'0.2738'	'0.0002'	'0.1204'
$\vartheta_E$	'0'	'0.0411'	'0.0001'	'0.9957'	'0.1924'
$\gamma_L$	'0.8941'	'0.9518'	'0.923'	'0.1143'	'0.1192'
$k_L$	'1'	'1.4103'	'1.0191'	'1.1723'	'0.2548'
$\lambda_{qf}$	'0.0305'	'0.1469'	'0.0887'	'0.9993'	'0.3524'
$\delta$	'0.1495'	'0.15'	'0.15'	'0.1498'	'0.1237'
$\eta_L$	'0.9678'	'1'	'0.9962'	'0.8767'	'0.3029'
$\vartheta_P$	'0.822'	'0.8924'	'0.8572'	'0.0025'	'0.1548'
$\gamma_H$	'0.9642'	'1'	'0.9885'	'0.976'	'0.1522'
$z$	'29.9237'	'30'	'29.9982'	'29.9915'	'0.1189'
$\eta_{\vartheta}$	'0.9596'	'1'	'0.9975'	'0.2324'	'0.3403'
$a_L$	'2.3187'	'2.982'	'2.6503'	'1.1862'	'0.3081'
$b_L$	'1'	'1.3341'	'1.0009'	'3.8928'	'0.2803'
$a_{\mu}$	'7.2955'	'8.0413'	'7.6684'	'5.5923'	'0.3384'
$b_{\mu}$	'13.1102'	'14.4723'	'13.7912'	'11.2374'	'0.3509'
$\mu$	'0.9559'	'1'	'0.9985'	'0.8348'	'0.3354'
$a_H$	'5.8028'	'6.4109'	'6.1069'	'4.6748'	'0.3332'
$b_H$	'14.2319'	'15'	'14.9493'	'14.6256'	'0.3226'
$\nu$	'0'	'26.8716'	'0.0167'	'0.1015'	'0.3029'
BP	'267.3099'	'267.5658'	'267.4378'	'266.5046'	'0.2827'



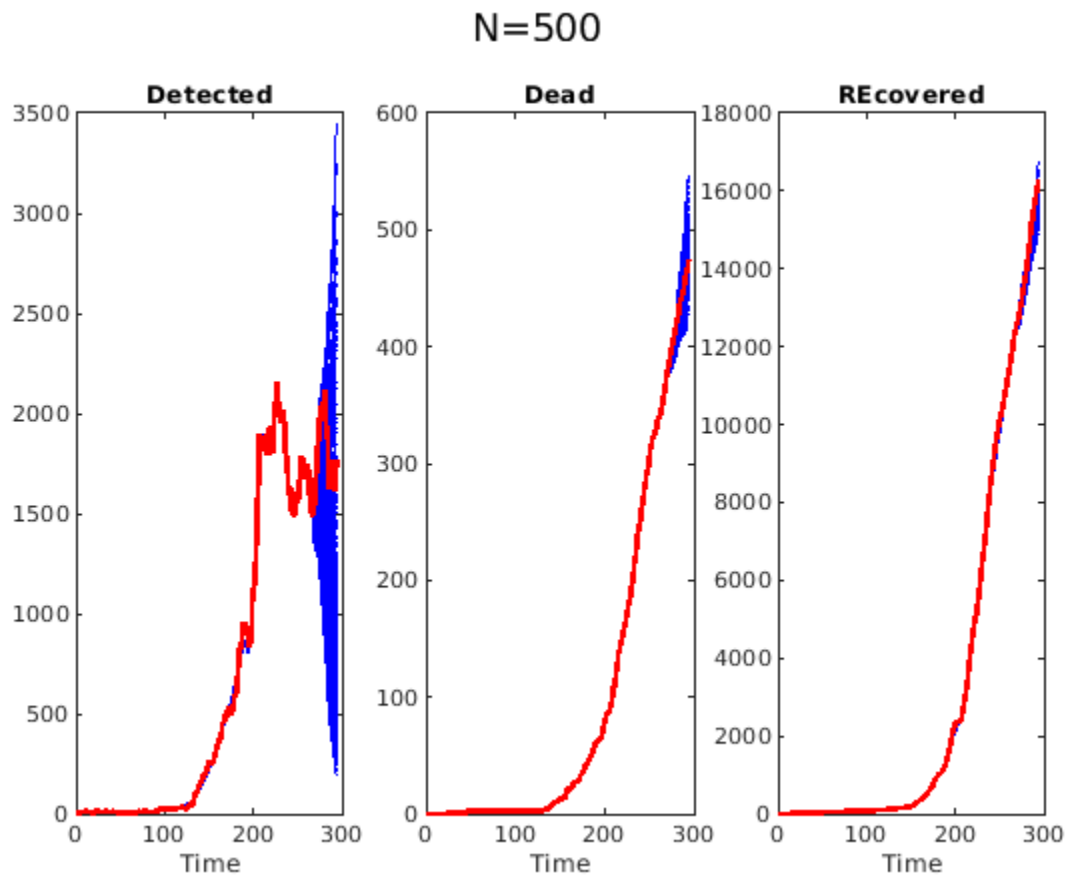
### 5.3. Identifiability analysis







## 5.4. Uncertainty analysys



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## Chapter 6. Extension number6

### 6.1. Basic information

The extension to be validated consists of the time series from the data295 to the 316. The status of the validation is: COMPLETED.

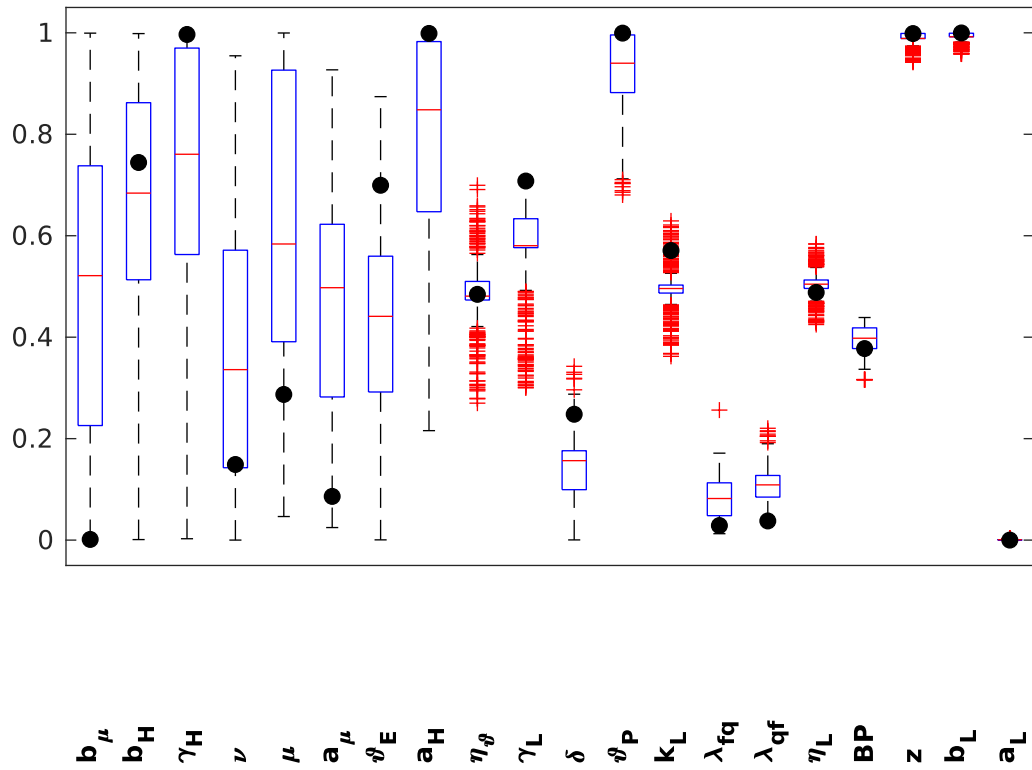
The number of estimations needed to perform the validation was1000.

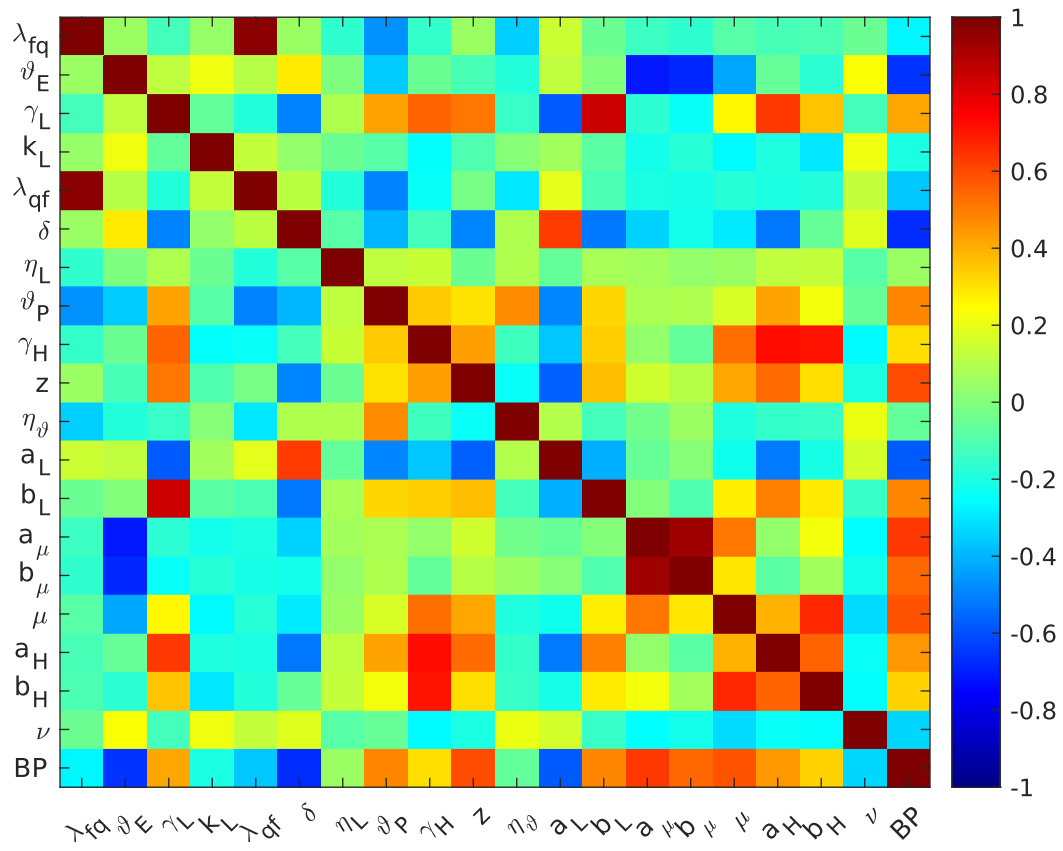
### 6.2. Estimated parameters with their intervals

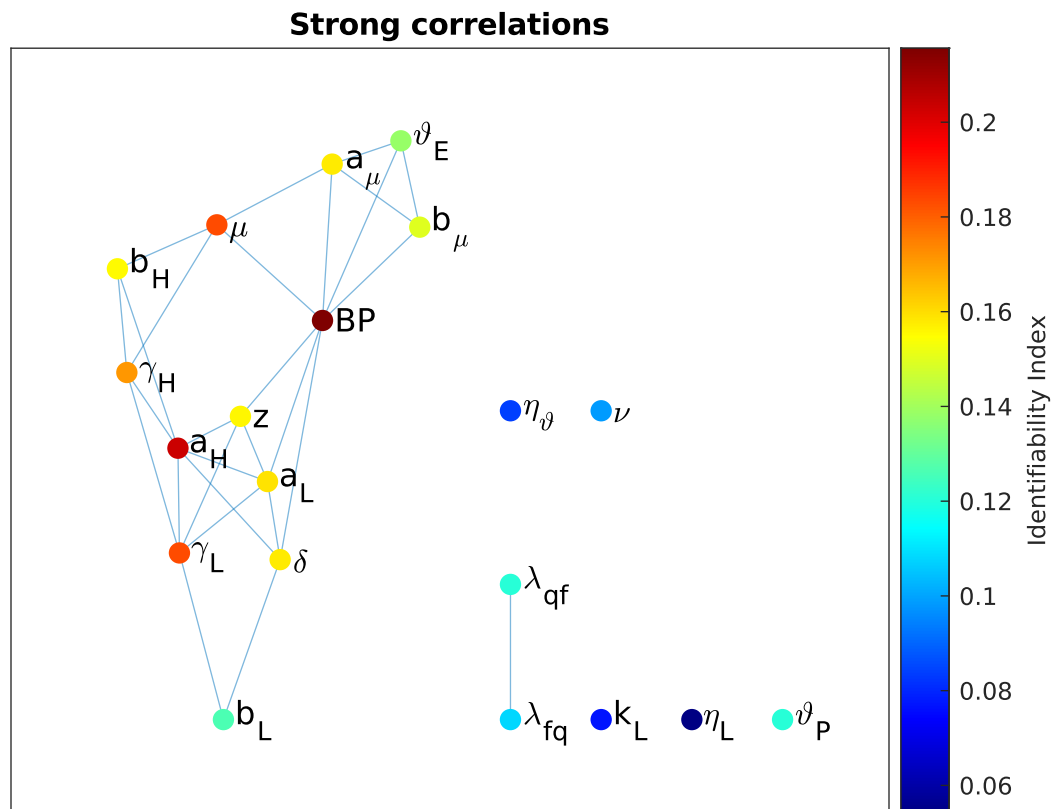
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0551'	'0.1089'	'0.082'	'0.0287'	'0.1083'
$\vartheta_E$	'0.4219'	'0.4603'	'0.4411'	'0.6995'	'0.1383'
$\gamma_L$	'0.5639'	'0.5968'	'0.5804'	'0.7078'	'0.1831'
$k_L$	'5.2916'	'5.6354'	'5.4635'	'6.1368'	'0.0774'
$\lambda_{qf}$	'0.0821'	'0.1357'	'0.1089'	'0.0377'	'0.1206'
$\delta$	'0.0215'	'0.0255'	'0.0235'	'0.0372'	'0.158'
$\eta_L$	'0.4954'	'0.5136'	'0.5045'	'0.4882'	'0.0543'
$\vartheta_P$	'0.9171'	'0.963'	'0.94'	'0.9994'	'0.1205'
$\gamma_H$	'0.736'	'0.7852'	'0.7606'	'0.9967'	'0.171'
$z$	'29.3198'	'30'	'29.6631'	'29.9553'	'0.1559'
$\eta_{\vartheta}$	'0.4598'	'0.5021'	'0.4809'	'0.4844'	'0.0844'
$a_L$	'1'	'1.0965'	'1.009'	'1.0004'	'0.1591'
$b_L$	'14.6085'	'15'	'14.8899'	'14.996'	'0.1267'
$a_{\mu}$	'7.637'	'8.2945'	'7.9657'	'2.2061'	'0.1583'
$b_{\mu}$	'7.8202'	'8.7764'	'8.2983'	'1.0186'	'0.1498'
$\mu$	'0.5525'	'0.6149'	'0.5837'	'0.2871'	'0.183'
$a_H$	'12.548'	'13.1952'	'12.8716'	'14.983'	'0.2035'
$b_H$	'10.1996'	'10.9526'	'10.5761'	'11.4211'	'0.1554'
$\nu$	'153.8022'	'182.2493'	'168.0257'	'74.5179'	'0.099'
BP	'286.3556'	'286.6444'	'286.5'	'285.5'	'0.2156'

### 6.3. Identifiability analysis

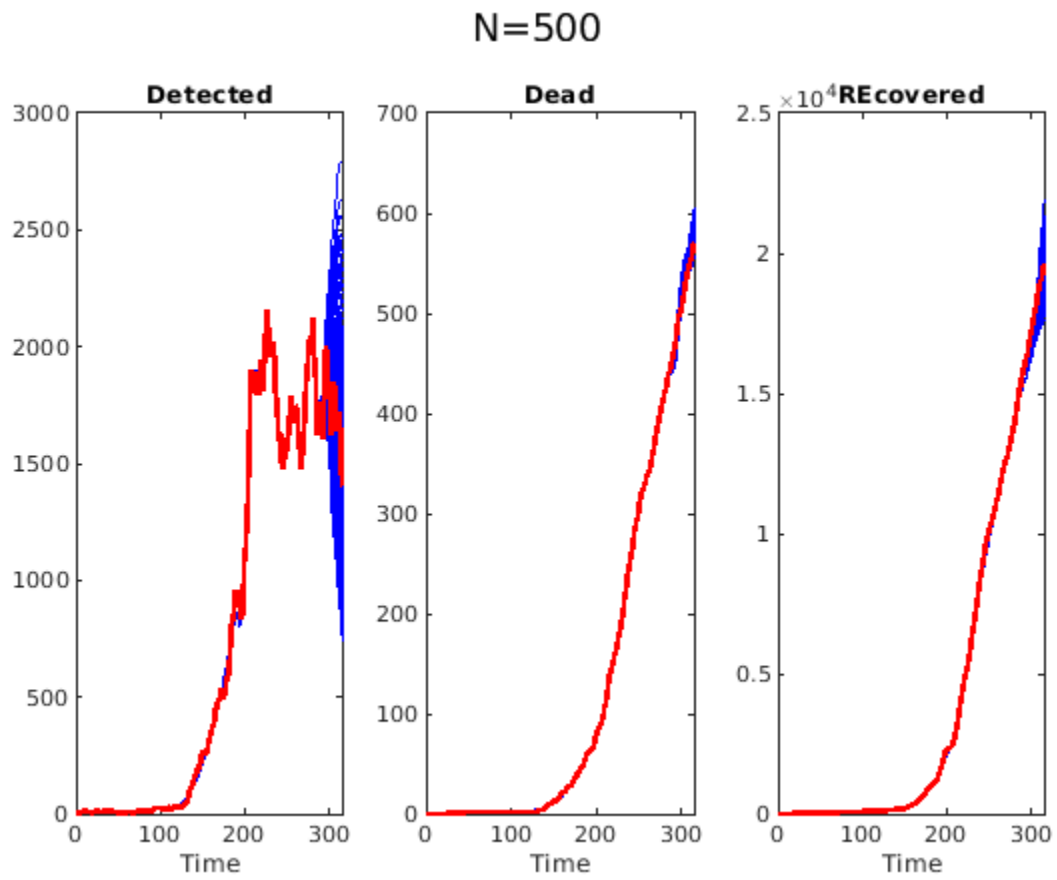








## 6.4. Uncertainty analysis



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## Chapter 7. Extension number7

### 7.1. Basic information

The extension to be validated consists of the time series from the data316 to the 374. The status of the validation is: COMPLETED.

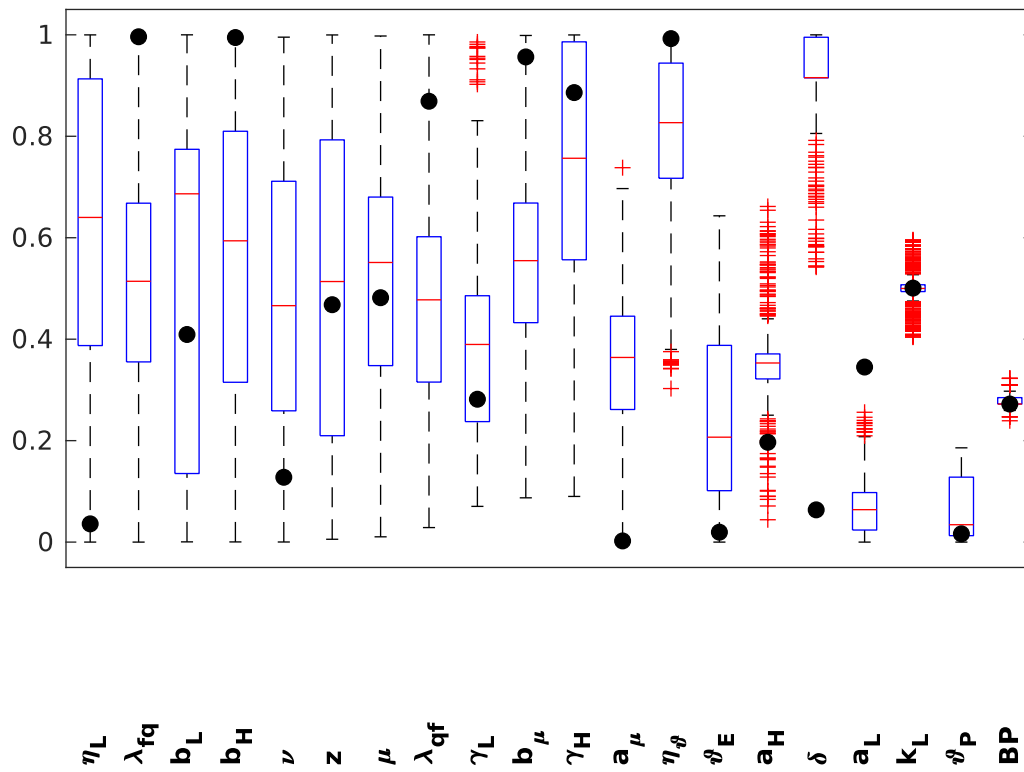
The number of estimations needed to perform the validation was1000.

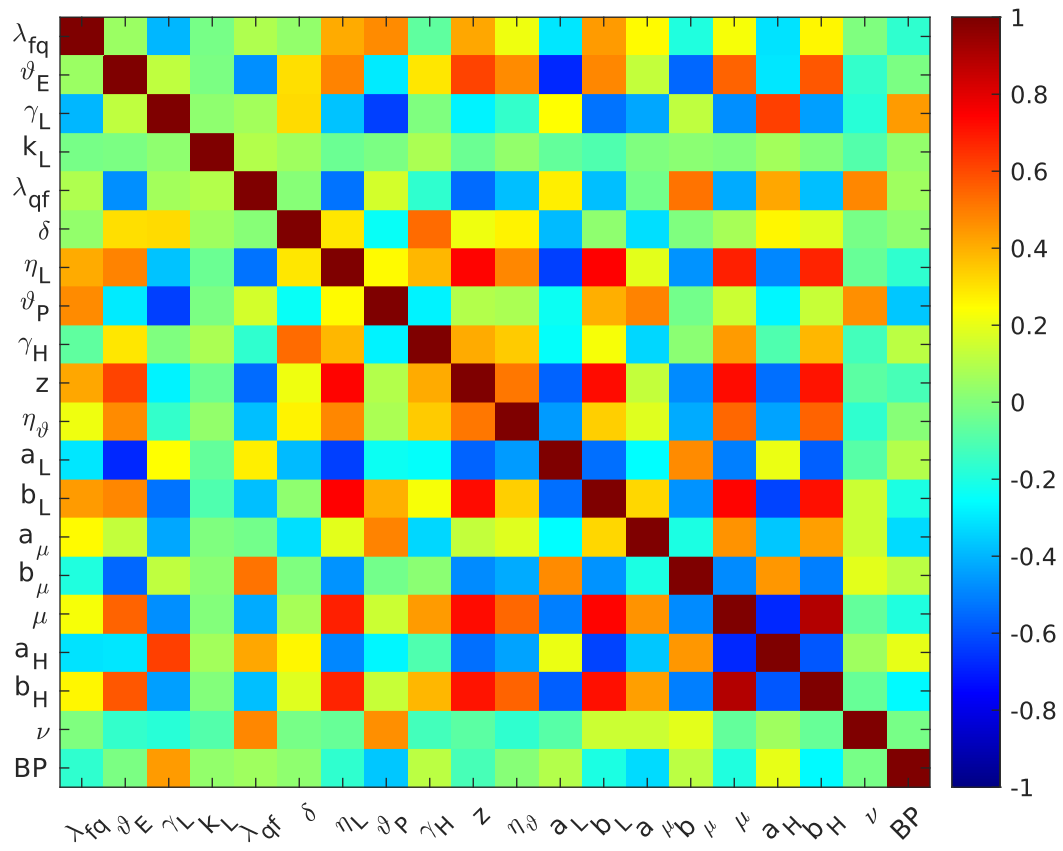
### 7.2. Estimated parameters with their intervals

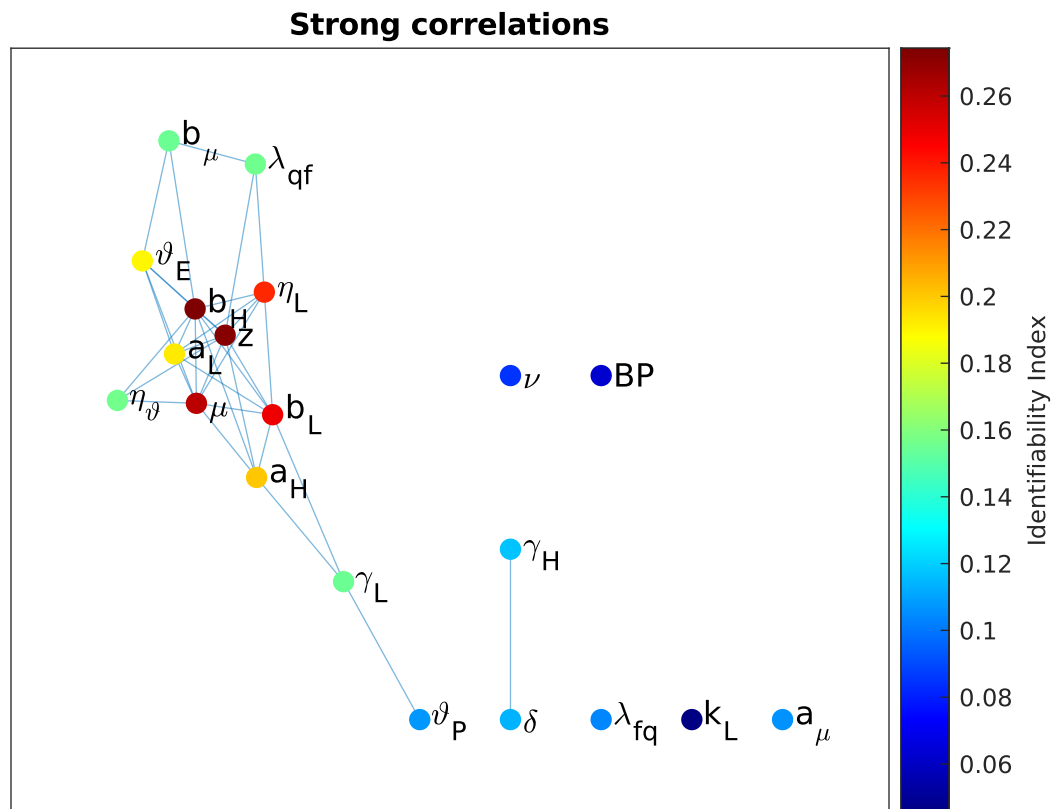
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.4889'	'0.5393'	'0.5141'	'0.9962'	'0.104'
$\vartheta_E$	'0.1865'	'0.2273'	'0.2069'	'0.0195'	'0.1896'
$\gamma_L$	'0.3702'	'0.4091'	'0.3896'	'0.2816'	'0.1549'
$k_L$	'5.4057'	'5.5947'	'5.5002'	'5.5064'	'0.0456'
$\lambda_{qf}$	'0.4526'	'0.5025'	'0.4776'	'0.869'	'0.1557'
$\delta$	'0.1325'	'0.142'	'0.1373'	'0.0095'	'0.1143'
$\eta_L$	'0.605'	'0.675'	'0.64'	'0.036'	'0.236'
$\vartheta_P$	'0.027'	'0.0417'	'0.0343'	'0.0163'	'0.1078'
$\gamma_H$	'0.733'	'0.7803'	'0.7567'	'0.8861'	'0.1178'
$z$	'14.3424'	'16.4767'	'15.4096'	'14.0394'	'0.2719'
$\eta_{\vartheta}$	'0.8082'	'0.8454'	'0.8268'	'0.9925'	'0.1565'
$a_L$	'1.7821'	'2.0086'	'1.8953'	'5.8311'	'0.1926'
$b_L$	'10.1238'	'11.1006'	'10.6122'	'6.7296'	'0.249'
$a_{\mu}$	'5.8287'	'6.3667'	'6.0977'	'1.0325'	'0.1065'
$b_{\mu}$	'8.4614'	'9.07'	'8.7657'	'14.3897'	'0.1553'
$\mu$	'0.5189'	'0.5835'	'0.5512'	'0.4818'	'0.2609'
$a_H$	'5.5822'	'6.3041'	'5.9432'	'3.7554'	'0.2002'
$b_H$	'8.8517'	'9.7784'	'9.315'	'14.9249'	'0.2743'
$\nu$	'219.1174'	'246.9844'	'233.0509'	'63.8997'	'0.0849'
BP	'316.3843'	'316.6157'	'316.5'	'316.4998'	'0.0628'

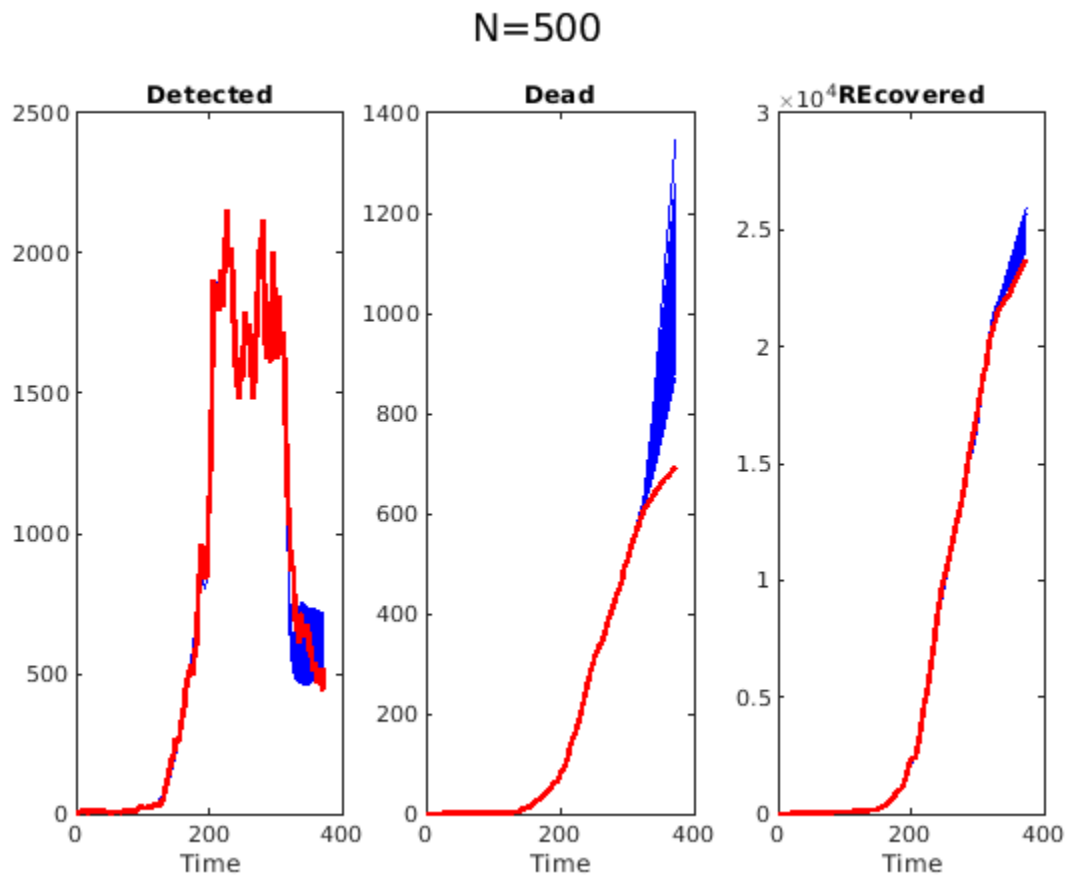
### 7.3. Identifiability analysis







## 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 data374 to the 402. The status of the validation is: COMPLETED.

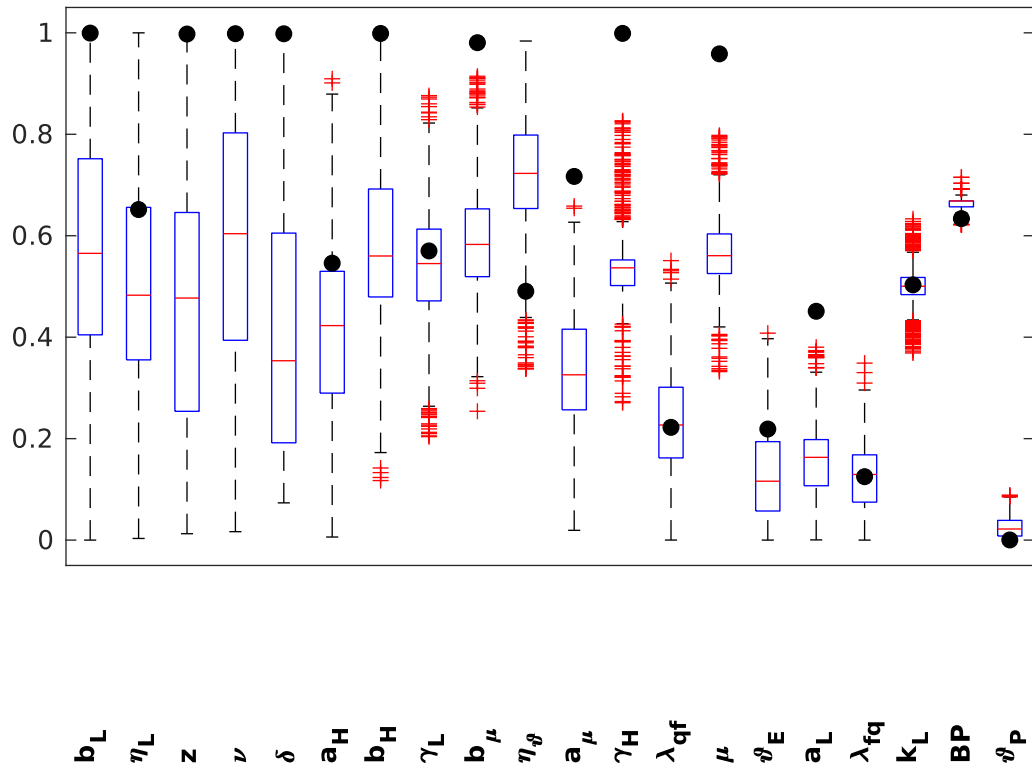
The number of estimations needed to perform the validation was1000.

### 8.2. Estimated parameters with their intervals

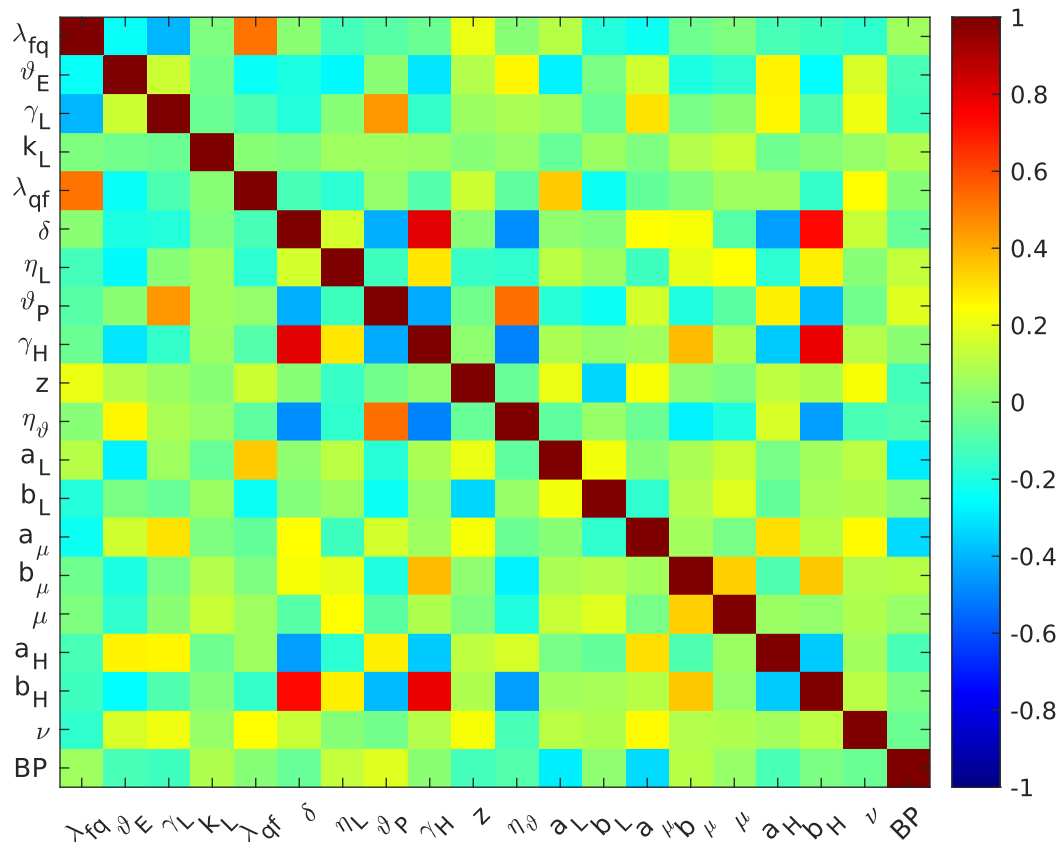
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

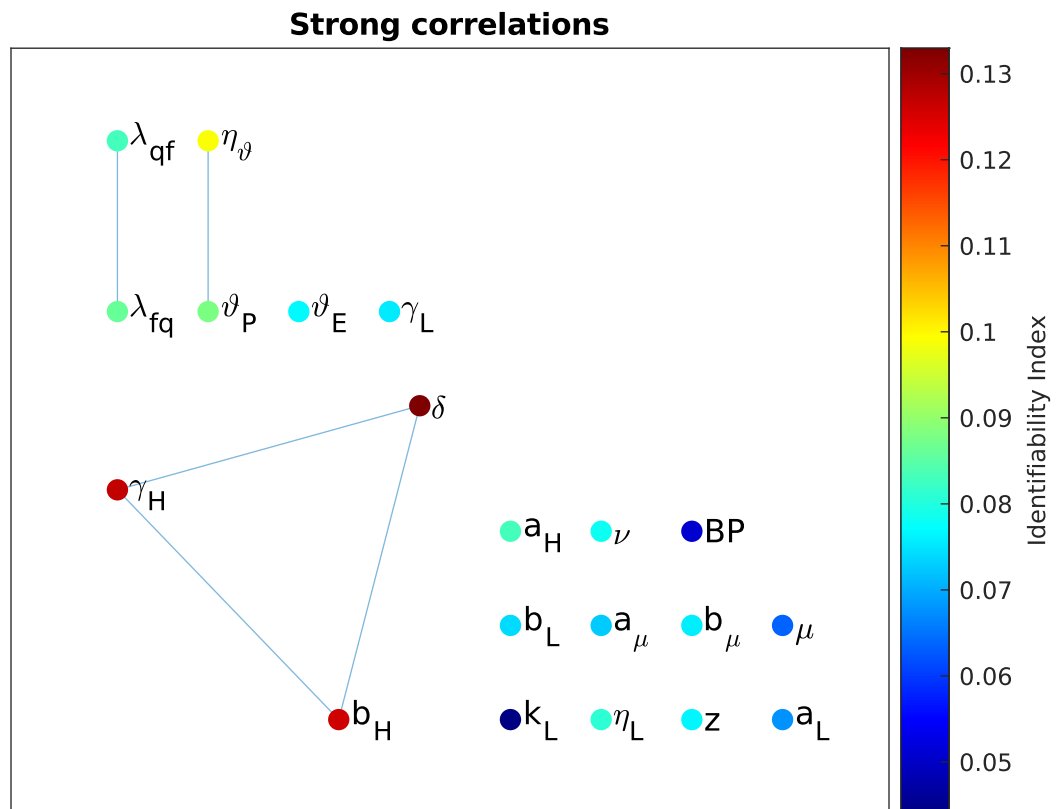
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.114'	'0.1447'	'0.1294'	'0.125'	'0.0861'
$\vartheta_E$	'0.1066'	'0.1256'	'0.1161'	'0.2189'	'0.0769'
$\gamma_L$	'0.5293'	'0.561'	'0.5451'	'0.5701'	'0.0756'
$k_L$	'5.4237'	'5.5843'	'5.504'	'5.5284'	'0.0442'
$\lambda_{qf}$	'0.2142'	'0.2396'	'0.2269'	'0.2223'	'0.0833'
$\delta$	'0.0487'	'0.0573'	'0.053'	'0.1497'	'0.133'
$\eta_L$	'0.4621'	'0.5034'	'0.4828'	'0.6516'	'0.081'
$\vartheta_P$	'0.0196'	'0.0242'	'0.0219'	'0.0003'	'0.0881'
$\gamma_H$	'0.5171'	'0.5563'	'0.5367'	'0.9989'	'0.1268'
$z$	'13.5689'	'15.0594'	'14.3142'	'29.9287'	'0.0766'
$\eta_{\vartheta}$	'0.7062'	'0.7396'	'0.7229'	'0.4905'	'0.0992'
$a_L$	'3.1098'	'3.458'	'3.2839'	'7.3149'	'0.0679'
$b_L$	'8.6025'	'9.2245'	'8.9135'	'14.9924'	'0.074'
$a_{\mu}$	'5.3941'	'5.7293'	'5.5617'	'11.0368'	'0.0726'
$b_{\mu}$	'8.9566'	'9.3636'	'9.1601'	'14.7281'	'0.0758'
$\mu$	'0.5466'	'0.5747'	'0.5607'	'0.9585'	'0.0638'
$a_H$	'6.6904'	'7.1493'	'6.9198'	'8.6424'	'0.0831'
$b_H$	'8.5609'	'9.1214'	'8.8411'	'14.9828'	'0.1258'
$\nu$	'289.8556'	'314.151'	'302.0033'	'499.1498'	'0.0782'
BP	'373.369'	'373.631'	'373.5'	'370.5'	'0.051'

## 8.3. Identifiability analysys

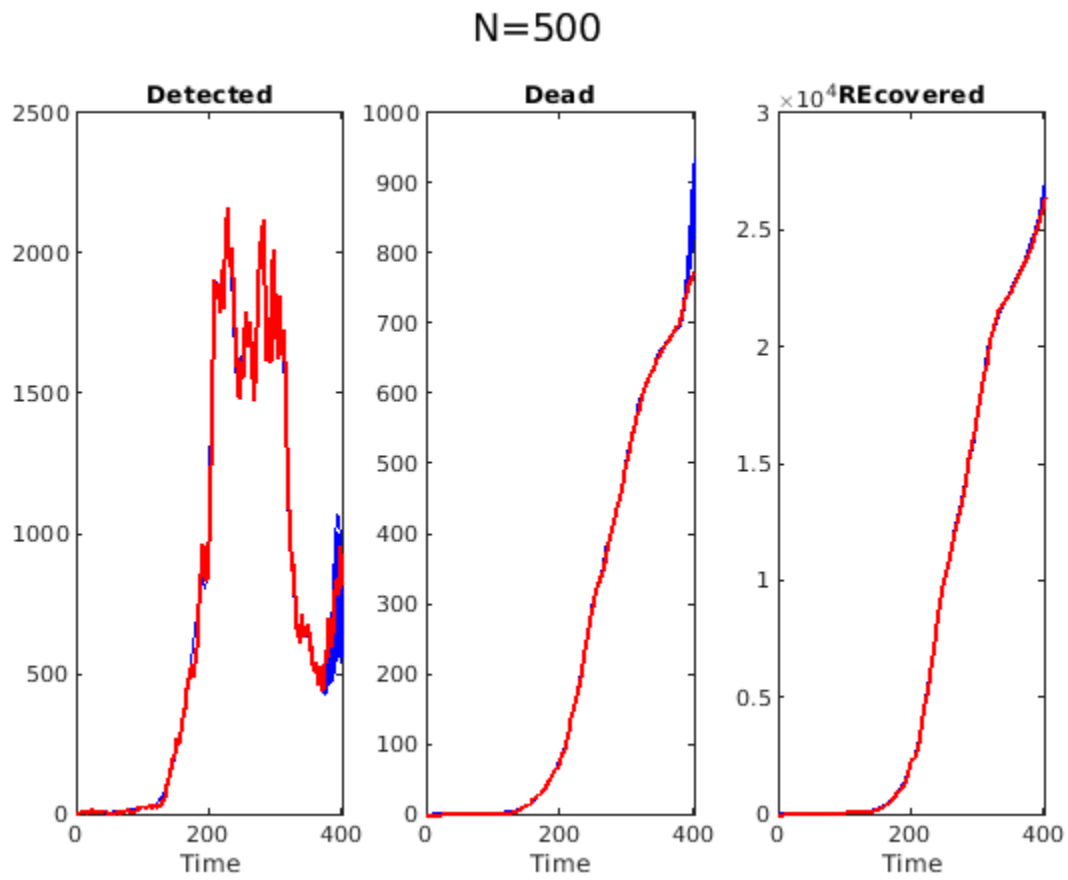








## 8.4. Uncertainty analysis



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## Chapter 9. Extension number9

### 9.1. Basic information

The extension to be validated consists of the time series from the data402 to the 433. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

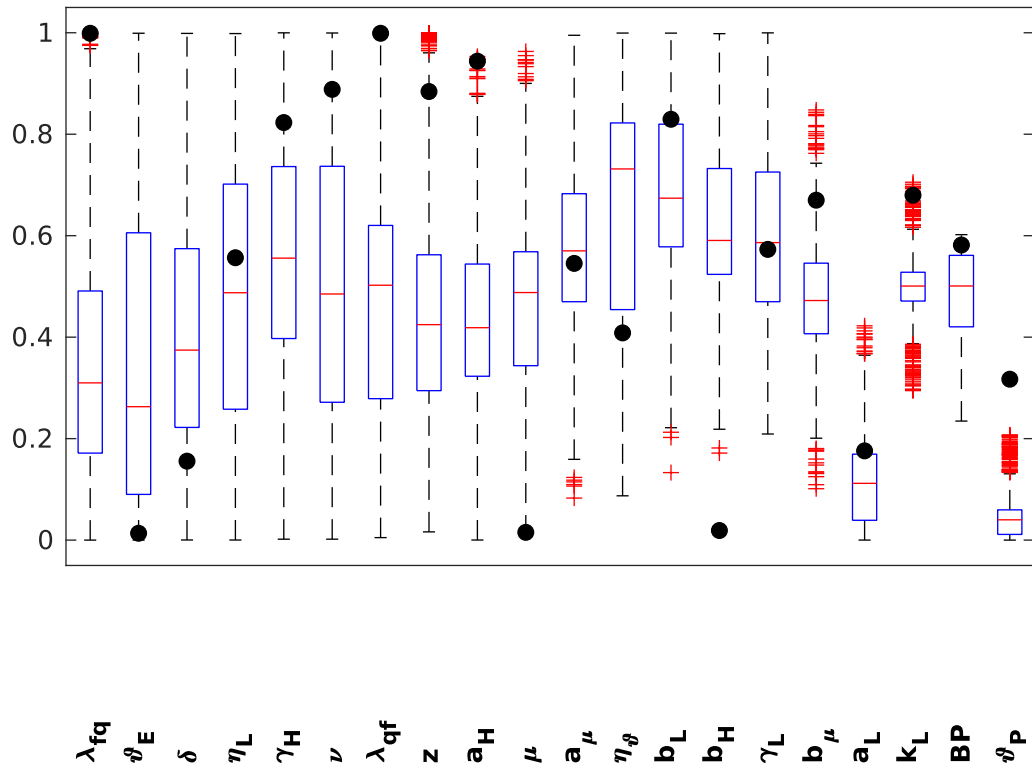
### 9.2. Estimated parameters with their intervals

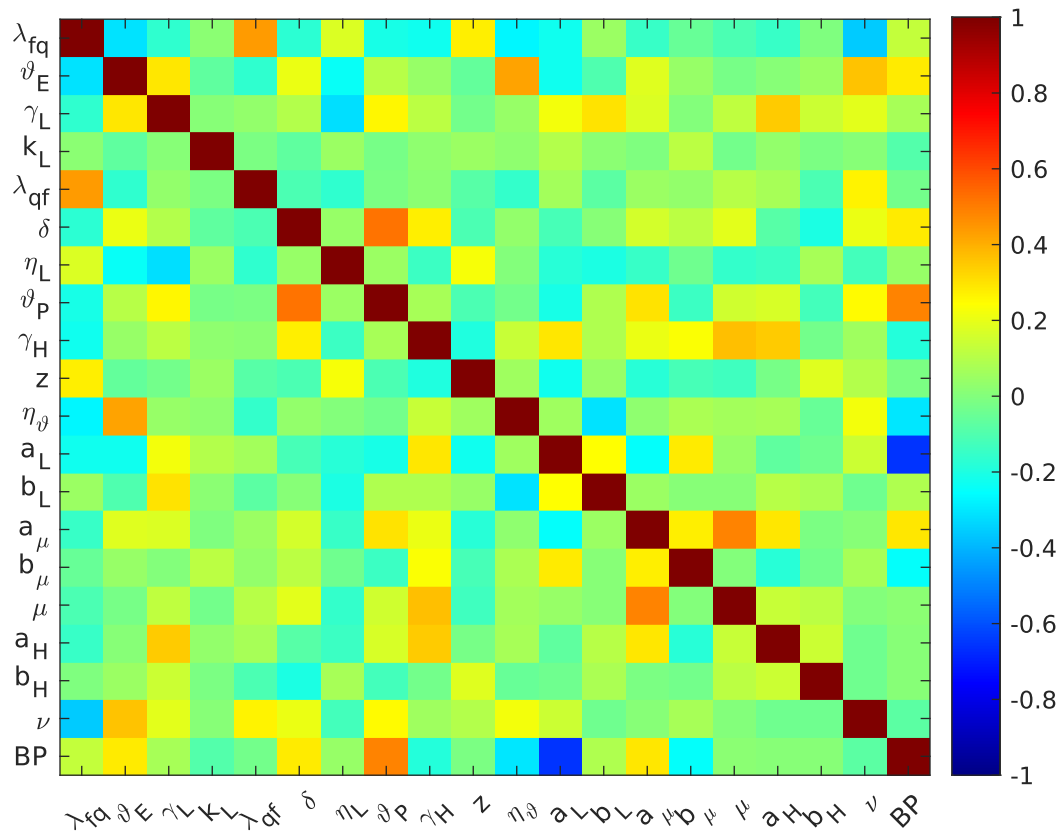
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

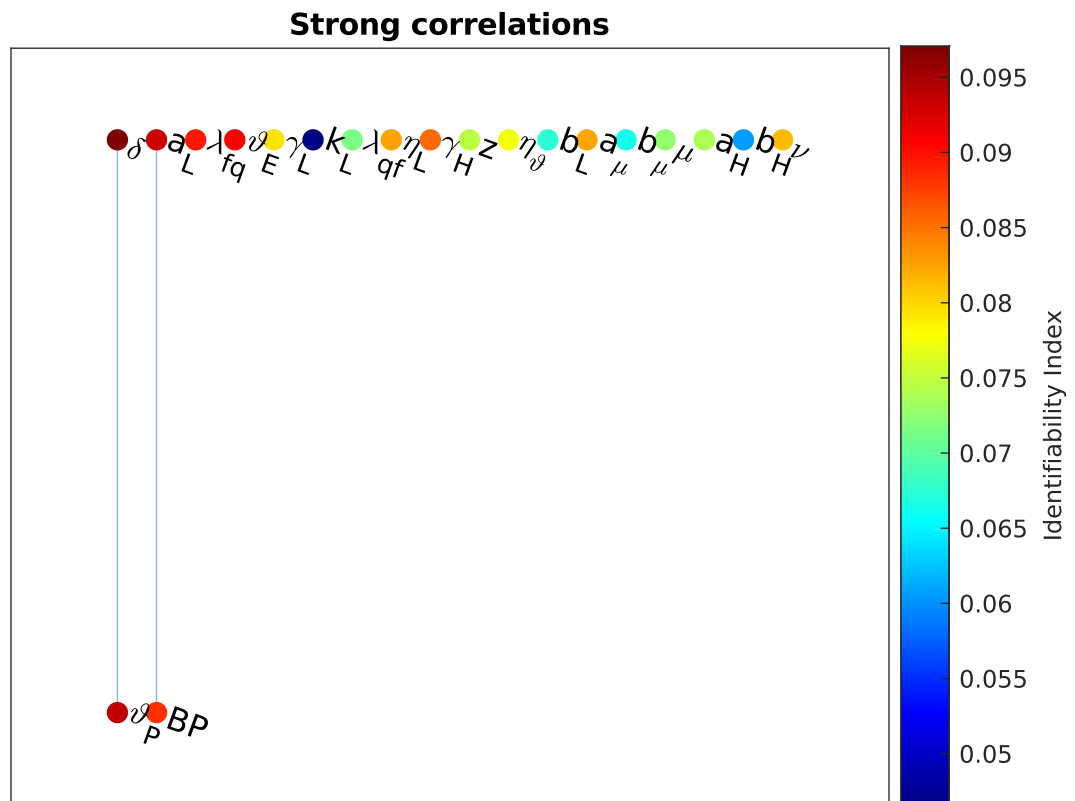
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
\lambda_{fq}	'0.7391'	'1'	'0.3099'	'0.9989'	'0.0895'
\vartheta_E	'0'	'0.0273'	'0.2629'	'0.0135'	'0.0907'
\gamma_L	'0.3167'	'0.5921'	'0.5864'	'0.573'	'0.0794'
k_L	'1'	'10'	'5.5069'	'7.1176'	'0.0466'
\lambda_{qf}	'0.8681'	'1'	'0.5024'	'0.9989'	'0.0716'
\delta	'0.0036'	'0.0525'	'0.0562'	'0.0233'	'0.0971'
\eta_L	'0.1168'	'1'	'0.4875'	'0.5565'	'0.0825'
\vartheta_P	'0.0926'	'0.4283'	'0.04'	'0.3171'	'0.0937'
\gamma_H	'0.09'	'0.913'	'0.5558'	'0.823'	'0.0854'
z	'17.3455'	'30'	'12.7404'	'26.5248'	'0.0747'
\eta_{\vartheta}	'0.0678'	'0.9189'	'0.7316'	'0.4084'	'0.0775'
a_L	'1.7677'	'3.6543'	'2.5665'	'3.4624'	'0.0932'
b_L	'8.7384'	'15'	'10.435'	'12.6129'	'0.0676'
a_{\mu}	'1'	'15'	'8.9816'	'8.6355'	'0.0824'
b_{\mu}	'1.7'	'14.468'	'7.6107'	'10.38'	'0.0665'
\mu	'0'	'0.0344'	'0.4879'	'0.0153'	'0.0728'
a_H	'1'	'15'	'6.8609'	'14.2156'	'0.0739'
b_H	'1'	'15'	'9.2686'	'1.2646'	'0.0604'
\nu	'344.1679'	'449.8131'	'242.5533'	'444.2027'	'0.0814'
BP	'401.4135'	'408.9243'	'398.5432'	'402.5'	'0.0882'

### 9.3. Identifiability analysis

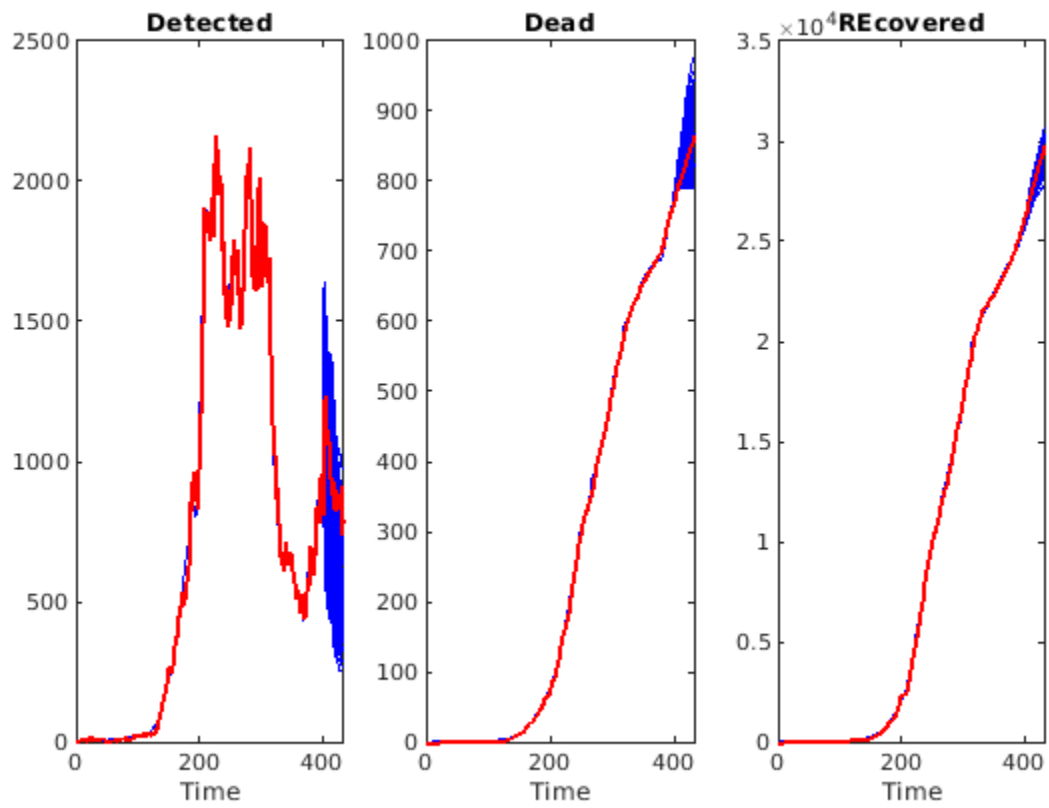






## 9.4. Uncertainty analysys

N=500





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## Chapter 10. Extension number10

### 10.1. Basic information

The extension to be validated consists of the time series from the data433 to the 535. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

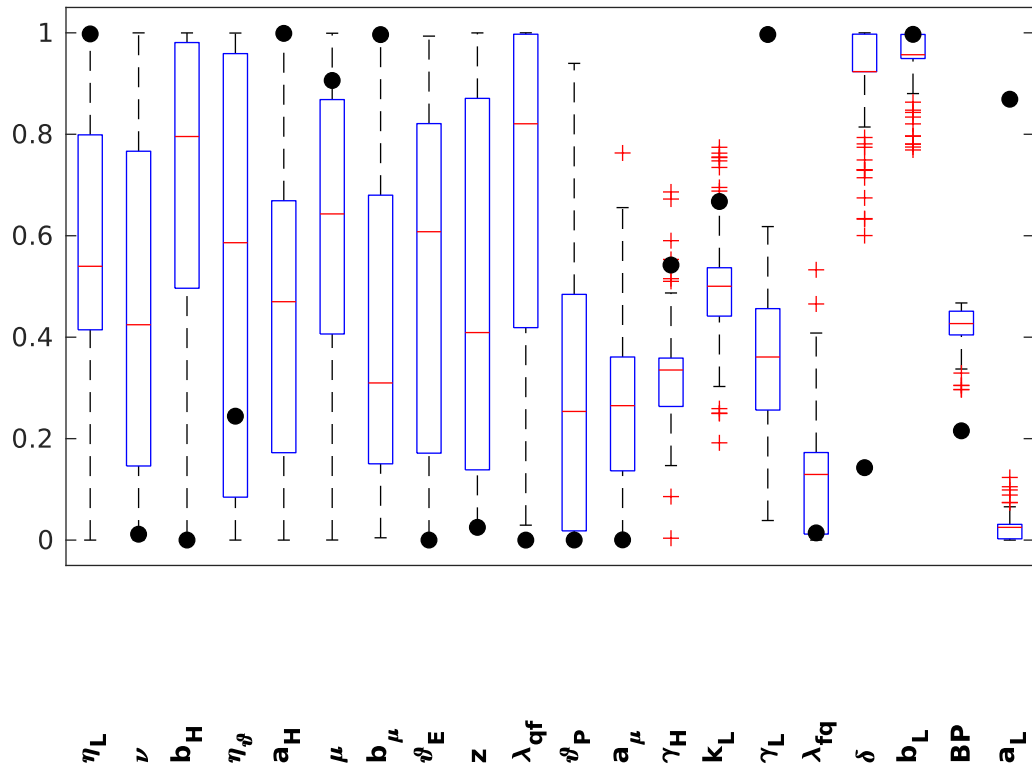
### 10.2. Estimated parameters with their intervals

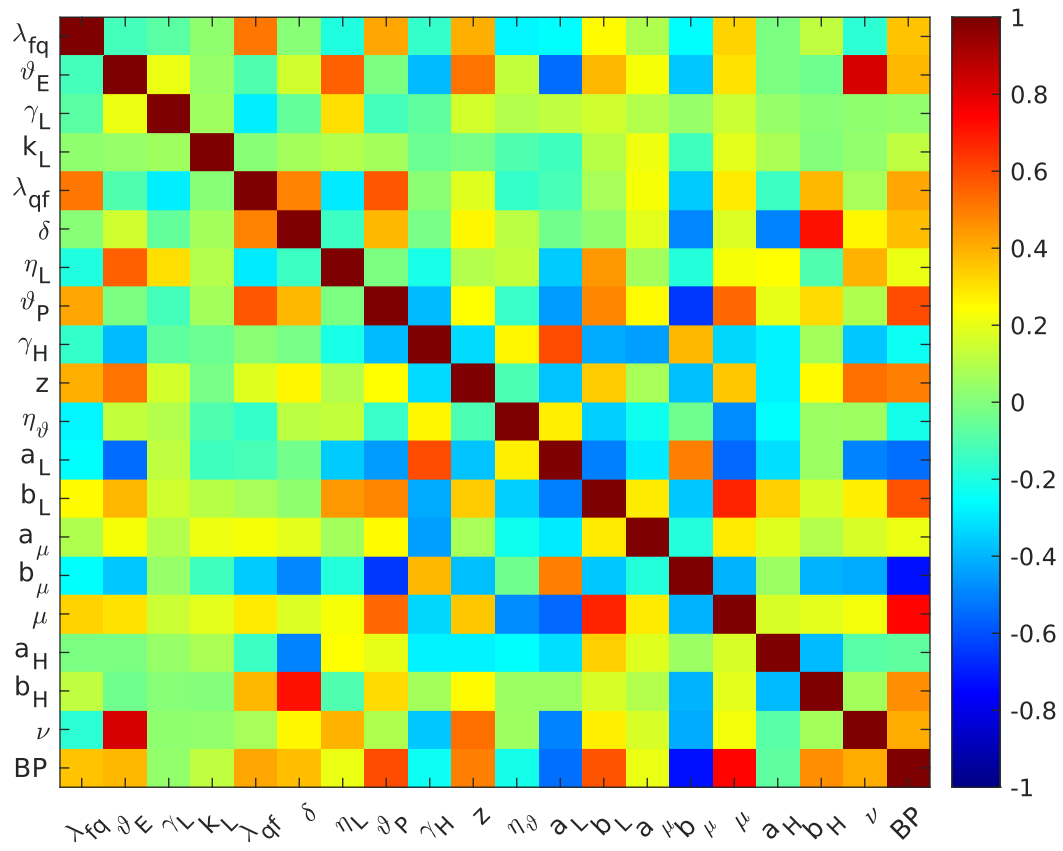
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

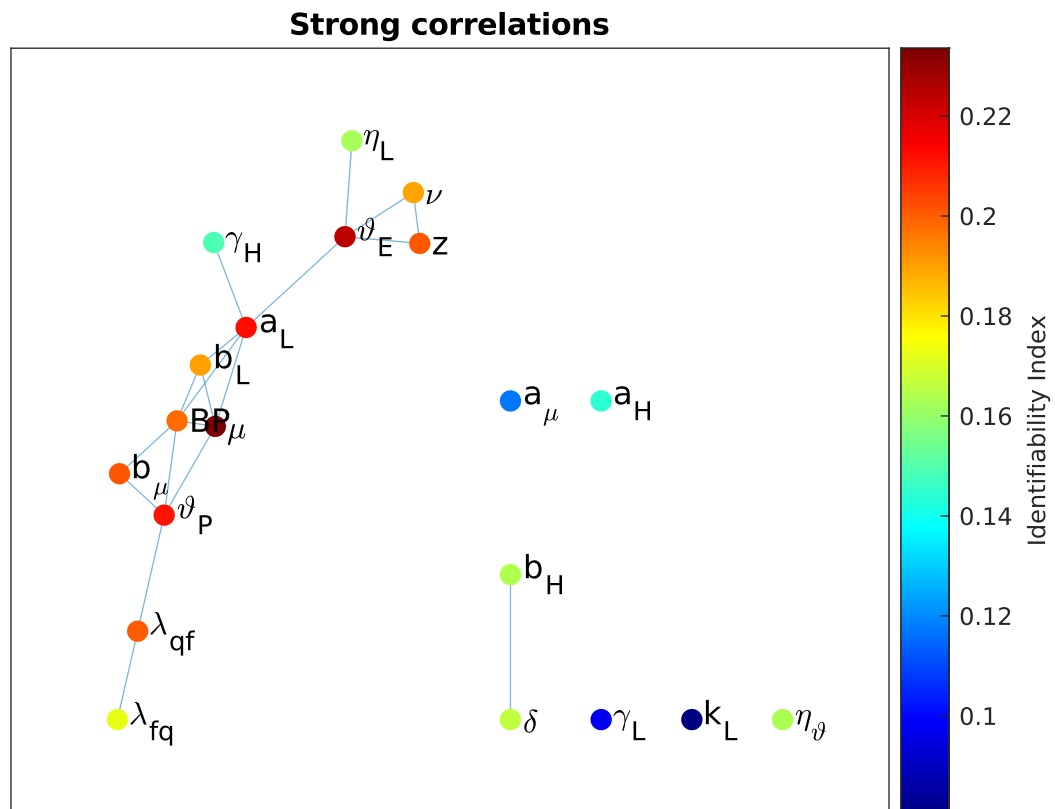
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0139'	'0.0155'	'0.1294'	'0.0142'	'0.1722'
$\vartheta_E$	'0.0001'	'0.0001'	'0.6079'	'0.0001'	'0.224'
$\gamma_L$	'0.7308'	'1'	'0.3609'	'0.9967'	'0.0971'
$k_L$	'3.0181'	'7.484'	'5.5037'	'7.0074'	'0.0807'
$\lambda_{qf}$	'0'	'0'	'0.8207'	'0'	'0.2004'
$\delta$	'0.0131'	'0.0222'	'0.1385'	'0.0214'	'0.1665'
$\eta_L$	'0.8863'	'1'	'0.5398'	'0.9978'	'0.1626'
$\vartheta_P$	'0.0002'	'0.0011'	'0.2536'	'0.0002'	'0.2109'
$\gamma_H$	'0.169'	'0.5631'	'0.3353'	'0.5422'	'0.1489'
$z$	'0.7012'	'0.7598'	'12.2732'	'0.7536'	'0.2008'
$\eta_{\vartheta}$	'0.2388'	'0.3013'	'0.5863'	'0.2443'	'0.1634'
$a_L$	'12.0881'	'13.1893'	'1.3517'	'13.1675'	'0.2124'
$b_L$	'14.2967'	'15'	'14.3955'	'14.9579'	'0.19'
$a_{\mu}$	'1'	'1.8767'	'4.7103'	'1.0064'	'0.1174'
$b_{\mu}$	'11.4349'	'15'	'5.3373'	'14.951'	'0.2013'
$\mu$	'0.5065'	'0.9198'	'0.643'	'0.9061'	'0.2336'
$a_H$	'12.9526'	'15'	'7.5793'	'14.9848'	'0.1442'
$b_H$	'1'	'2.9095'	'12.1384'	'1.0014'	'0.164'
$\nu$	'5.6472'	'11.9124'	'212.2728'	'5.8015'	'0.1899'
BP	'427.3376'	'448.141'	'454.5'	'428.5'	'0.1981'

### 10.3. Identifiability analysis

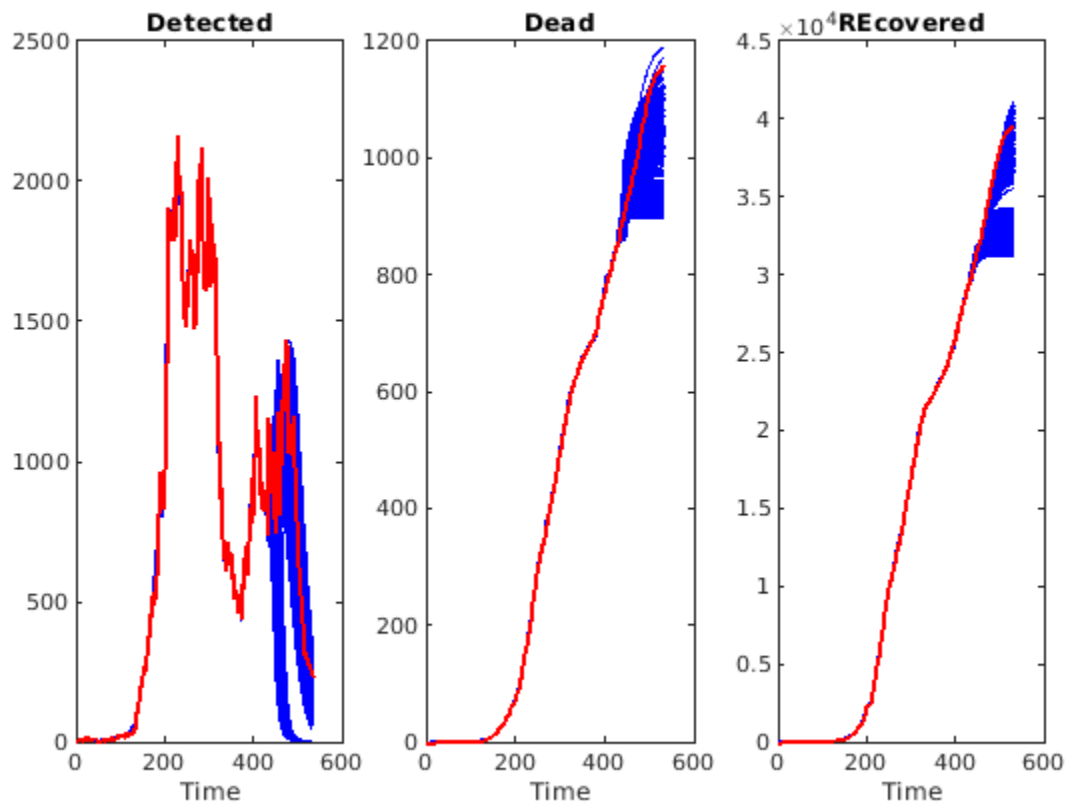






## 10.4. Uncertainty analysis

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 data535 to the 621. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

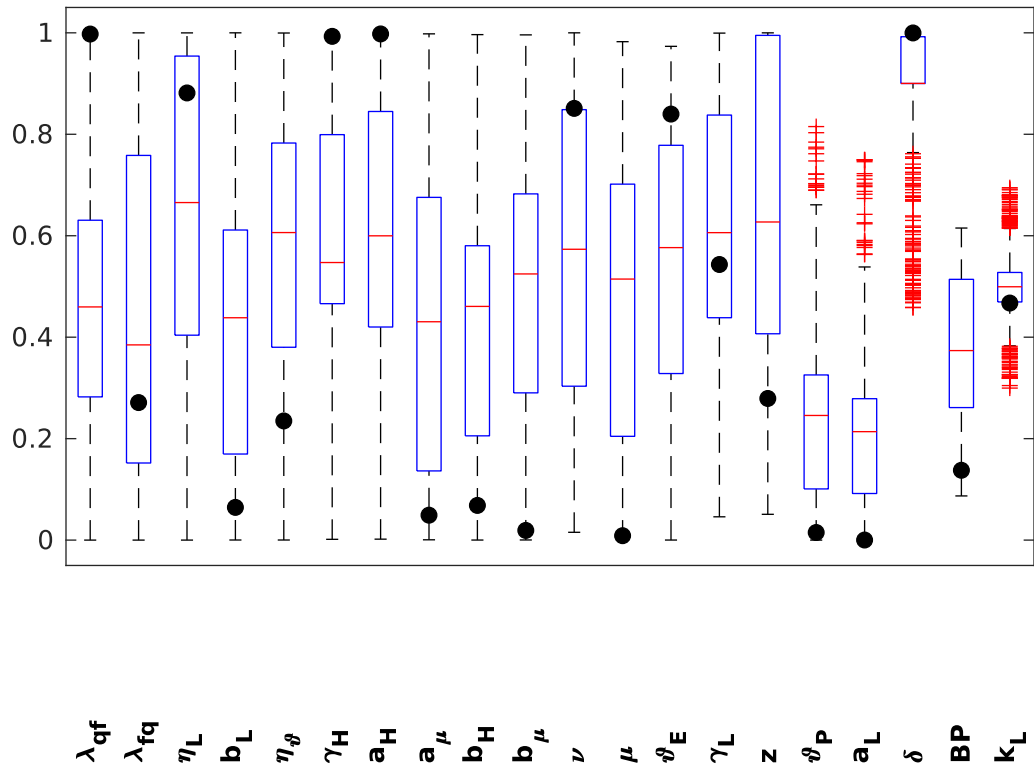
### 11.2. Estimated parameters with their intervals

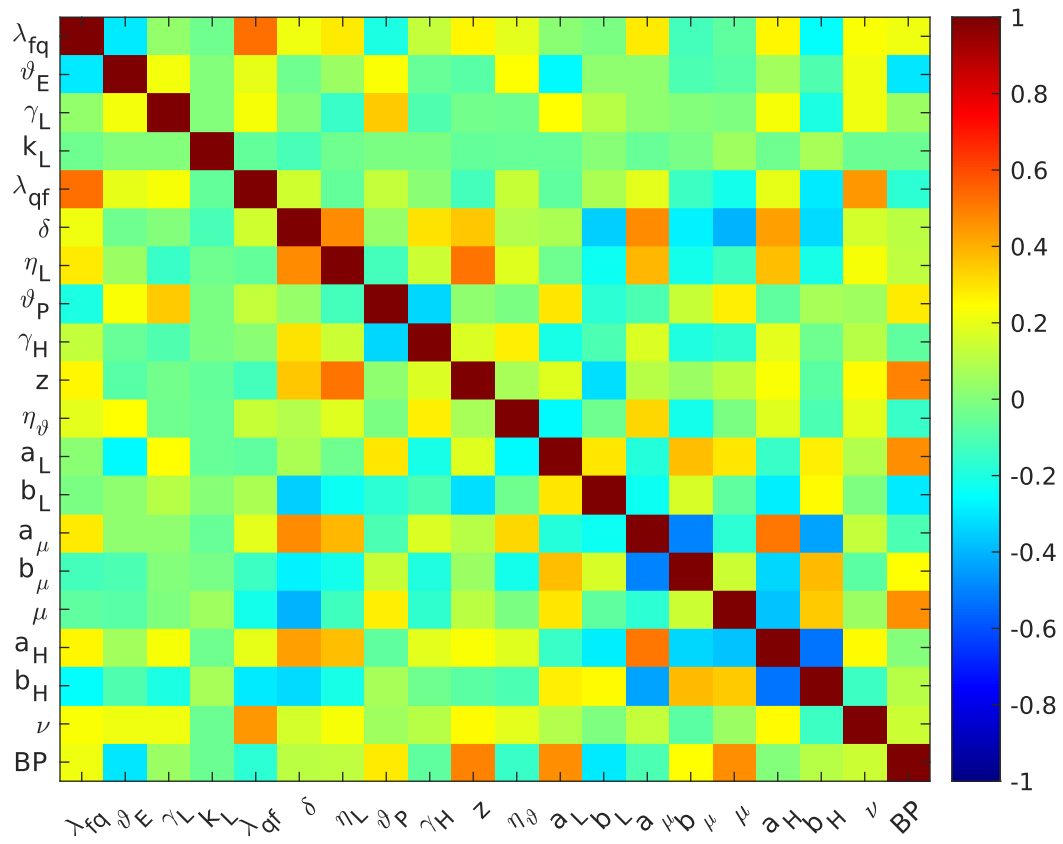
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

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

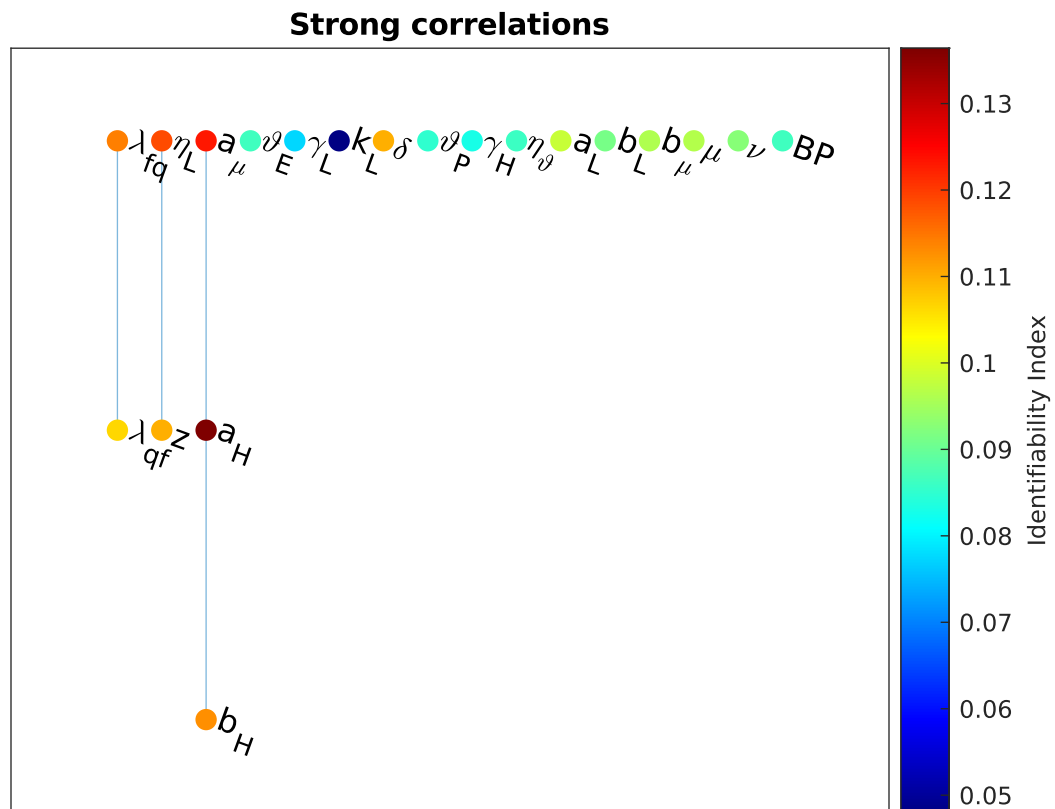
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.2427'	'0.281'	'0.3848'	'0.2711'	'0.1141'
$\vartheta_E$	'0.8288'	'0.8412'	'0.5766'	'0.8398'	'0.0865'
$\gamma_L$	'0.5139'	'0.8962'	'0.6061'	'0.5433'	'0.0777'
$k_L$	'1.621'	'8.5902'	'5.4946'	'5.2058'	'0.048'
$\lambda_{qf}$	'0.9033'	'1'	'0.4597'	'0.9976'	'0.1064'
$\delta$	'0.0987'	'0.15'	'0.135'	'0.15'	'0.1099'
$\eta_L$	'0.4991'	'0.9257'	'0.6654'	'0.8815'	'0.1187'
$\vartheta_P$	'0.0129'	'0.0334'	'0.2461'	'0.015'	'0.085'
$\gamma_H$	'0.4693'	'1'	'0.5472'	'0.993'	'0.0832'
$z$	'8.1526'	'8.8056'	'18.8132'	'8.376'	'0.1099'
$\eta_{\vartheta}$	'0.1905'	'0.2849'	'0.6062'	'0.2349'	'0.0863'
$a_L$	'1'	'1.2969'	'3.994'	'1.0021'	'0.0981'
$b_L$	'1.8833'	'6.6853'	'7.1365'	'1.9027'	'0.0912'
$a_{\mu}$	'1.56'	'12.9554'	'7.0261'	'1.6879'	'0.123'
$b_{\mu}$	'1.2182'	'11.9106'	'8.3456'	'1.2668'	'0.0963'
$\mu$	'0.0017'	'0.0177'	'0.5146'	'0.0087'	'0.0964'
$a_H$	'6.2234'	'15'	'9.3976'	'14.9692'	'0.1364'
$b_H$	'1.1037'	'9.5432'	'7.4494'	'1.9572'	'0.1129'
$\nu$	'364.7601'	'467.1129'	'286.6634'	'425.5229'	'0.0929'
BP	'435.1595'	'486.4531'	'499.5'	'457.5'	'0.0866'

### 11.3. Identifiability analysis

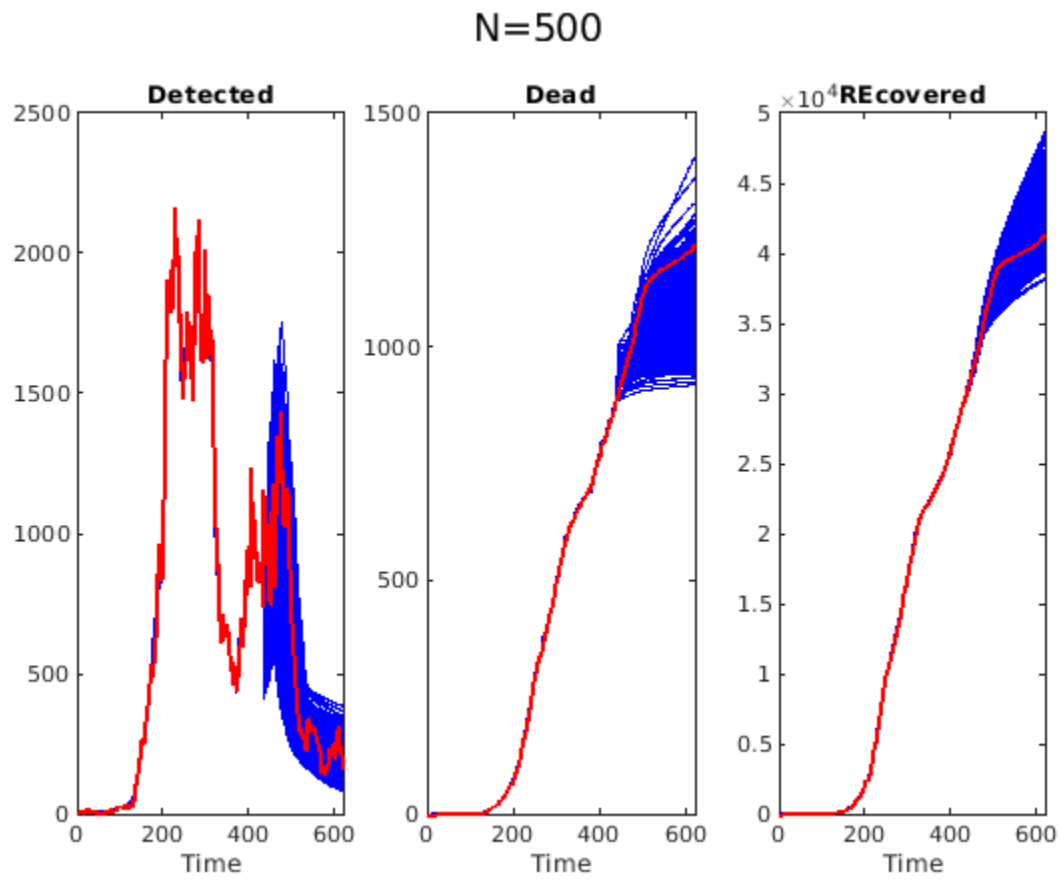








## 11.4. Uncertainty analysis



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## Chapter 12. Extension number12

### 12.1. Basic information

The extension to be validated consists of the time series from the data621 to the 717. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

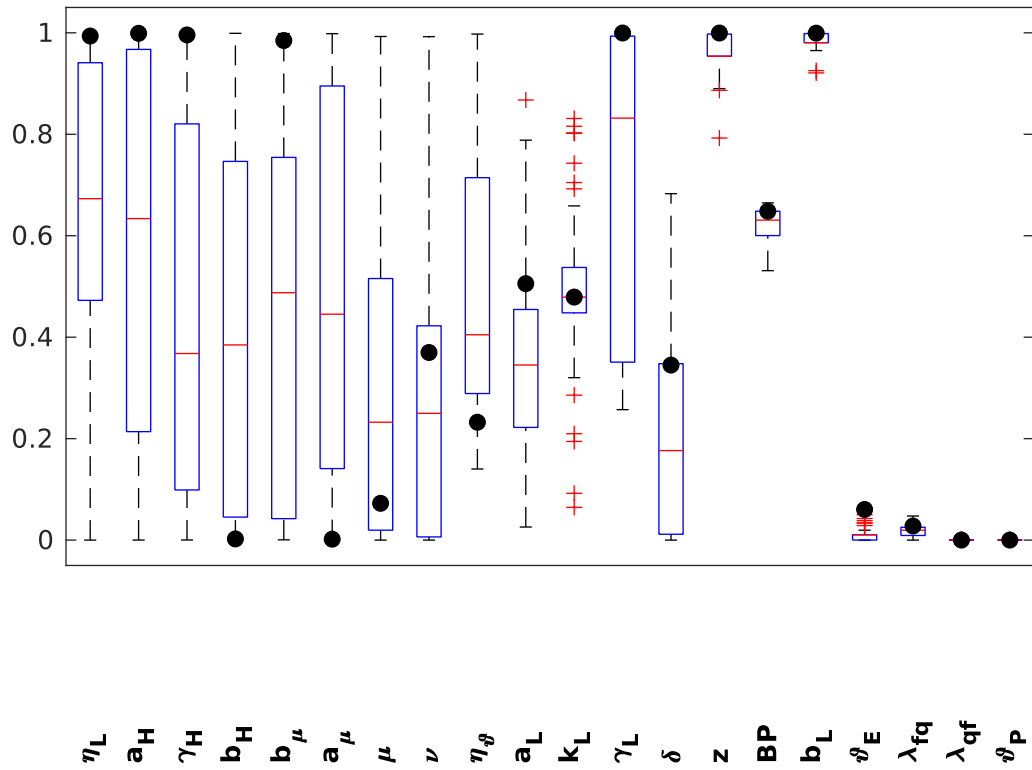
### 12.2. Estimated parameters with their intervals

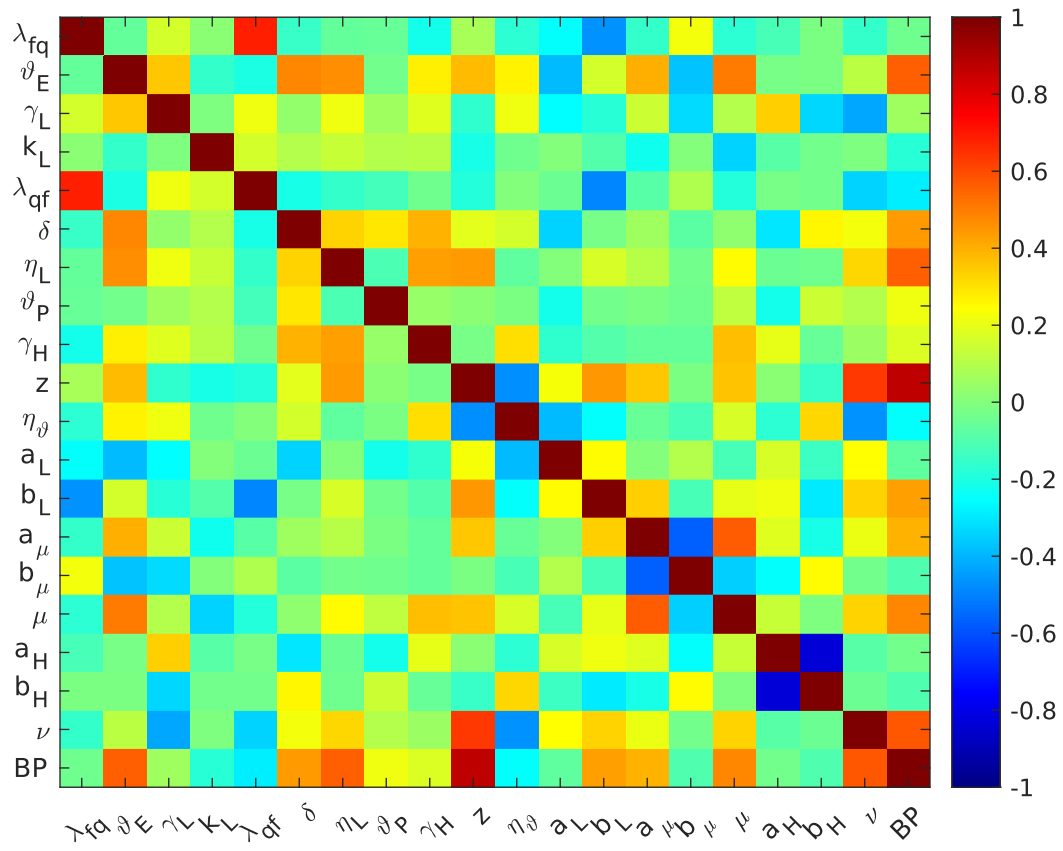
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

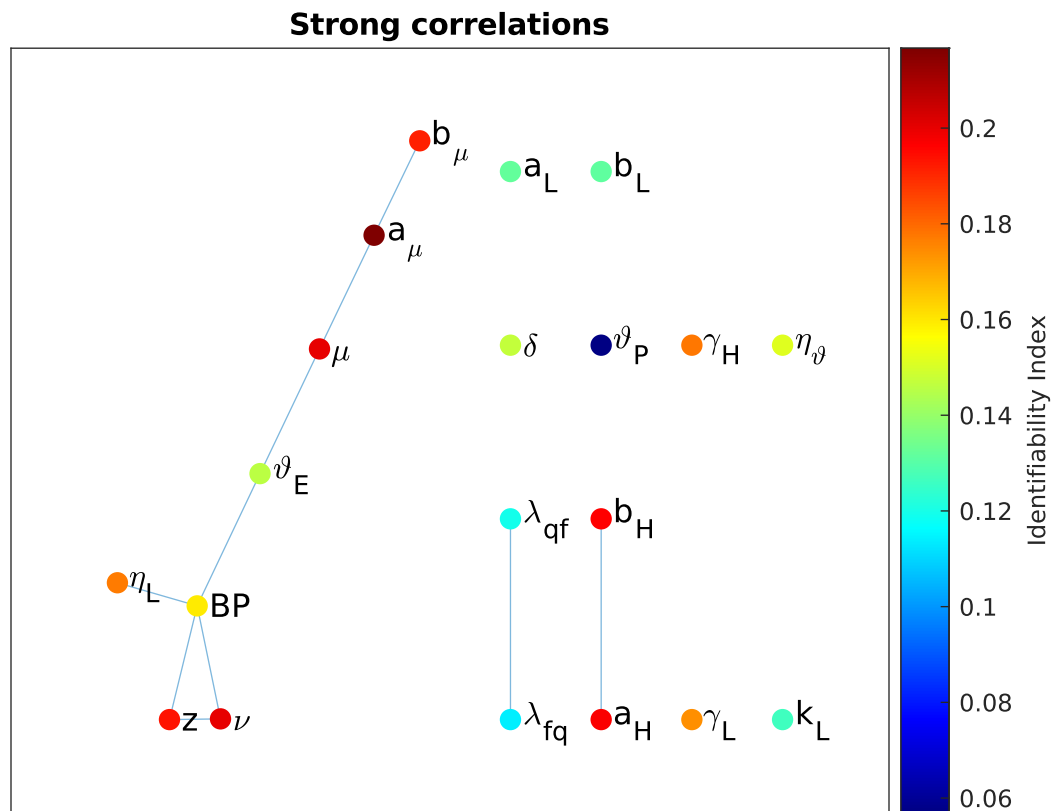
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.0266'	'0.037'	'0.0195'	'0.0278'	'0.1139'
$\vartheta_E$	'0'	'0.1358'	'0.0104'	'0.0604'	'0.1458'
$\gamma_L$	'0.5237'	'1'	'0.8319'	'0.9996'	'0.1739'
$k_L$	'1.6638'	'10'	'5.3116'	'5.3116'	'0.1268'
$\lambda_{qf}$	'0'	'0.0002'	'0.0003'	'0.0001'	'0.1194'
$\delta$	'0.0082'	'0.1048'	'0.0265'	'0.0518'	'0.1471'
$\eta_L$	'0.19'	'1'	'0.673'	'0.9937'	'0.1773'
$\vartheta_P$	'0'	'0.2902'	'0.0001'	'0.0001'	'0.057'
$\gamma_H$	'0.1108'	'1'	'0.3678'	'0.9958'	'0.1775'
$z$	'22.222'	'30'	'28.6191'	'29.9881'	'0.1934'
$\eta_{\vartheta}$	'0.1467'	'0.3649'	'0.4048'	'0.2324'	'0.1518'
$a_L$	'5.763'	'8.9754'	'5.8327'	'8.078'	'0.1324'
$b_L$	'9.4114'	'15'	'14.7278'	'14.9907'	'0.1318'
$a_{\mu}$	'1'	'13.6'	'7.2351'	'1.0257'	'0.2167'
$b_{\mu}$	'2.904'	'15'	'7.8276'	'14.7869'	'0.1917'
$\mu$	'0'	'0.155'	'0.2324'	'0.0725'	'0.2005'
$a_H$	'1.56'	'15'	'9.8726'	'14.9868'	'0.1973'
$b_H$	'1'	'13.6'	'6.3867'	'1.0327'	'0.1961'
$\nu$	'177.9169'	'277.5927'	'124.9507'	'184.9273'	'0.1999'
BP	'644.5163'	'649.3549'	'643.5'	'646.4982'	'0.1599'

### 12.3. Identifiability analysis

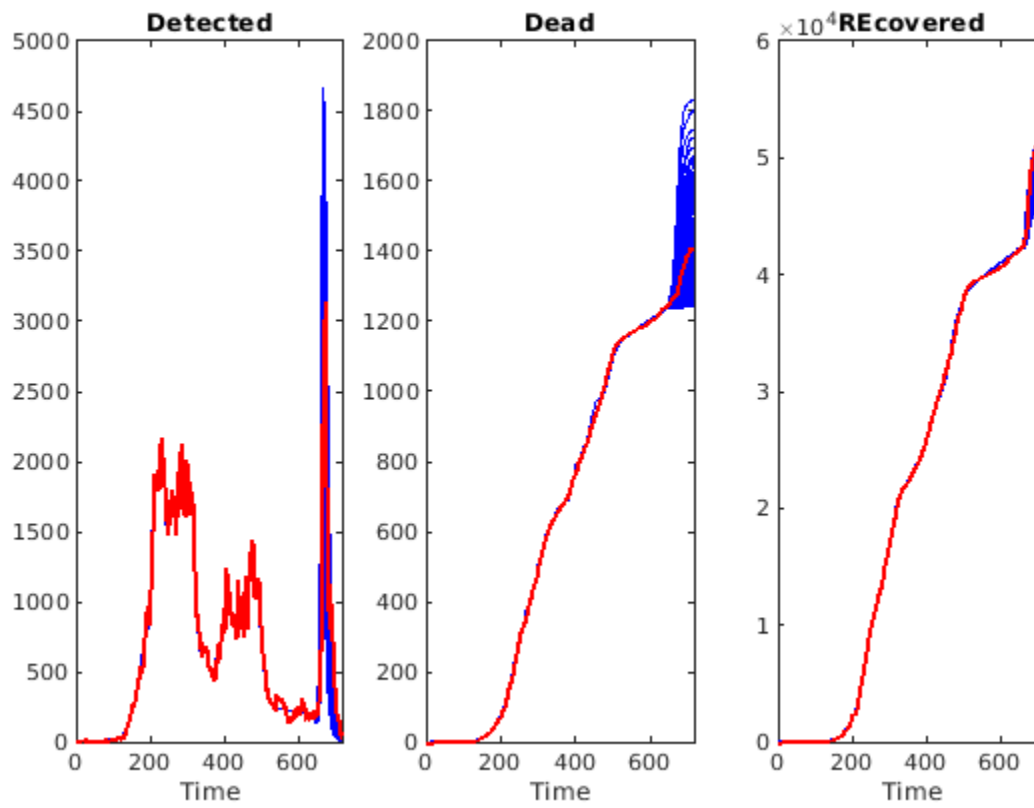






## 12.4. Uncertainty analysis

N=500



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## Chapter 13. Extension number13

### 13.1. Basic information

The extension to be validated consists of the time series from the data717 to the 733. The status of the validation is: COMPLETED.

The number of estimations needed to perform the validation was1000.

### 13.2. Estimated parameters with their intervals

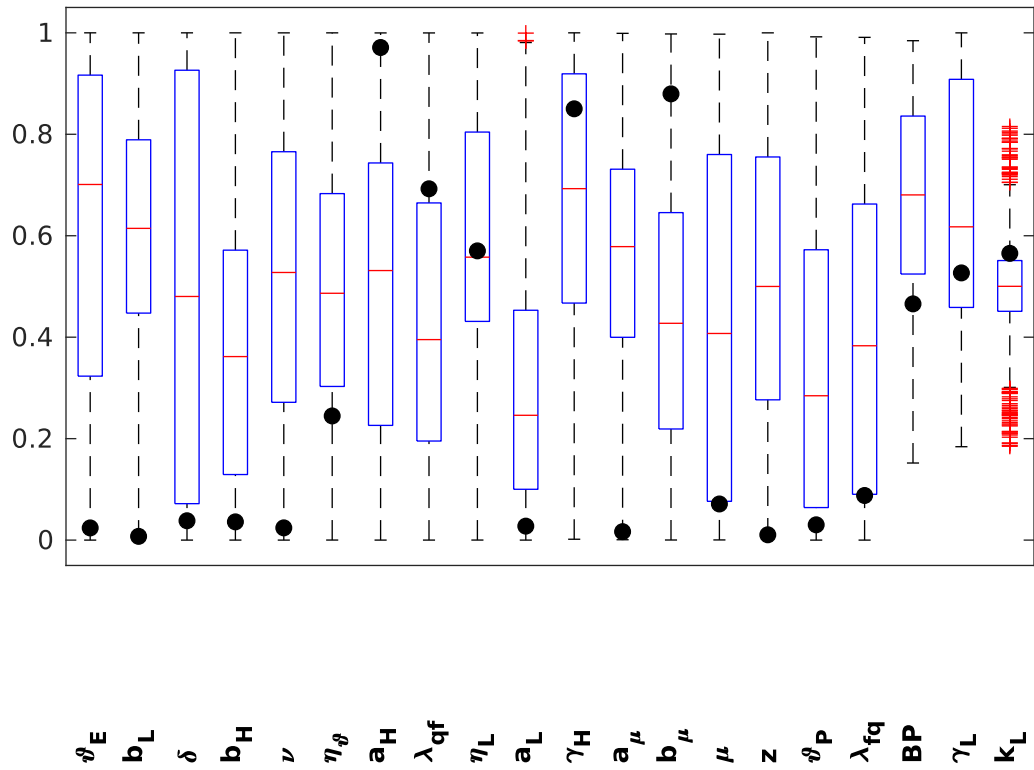
It was necessary to fix 0 parameters of 10 that could be fixed to complete validation.

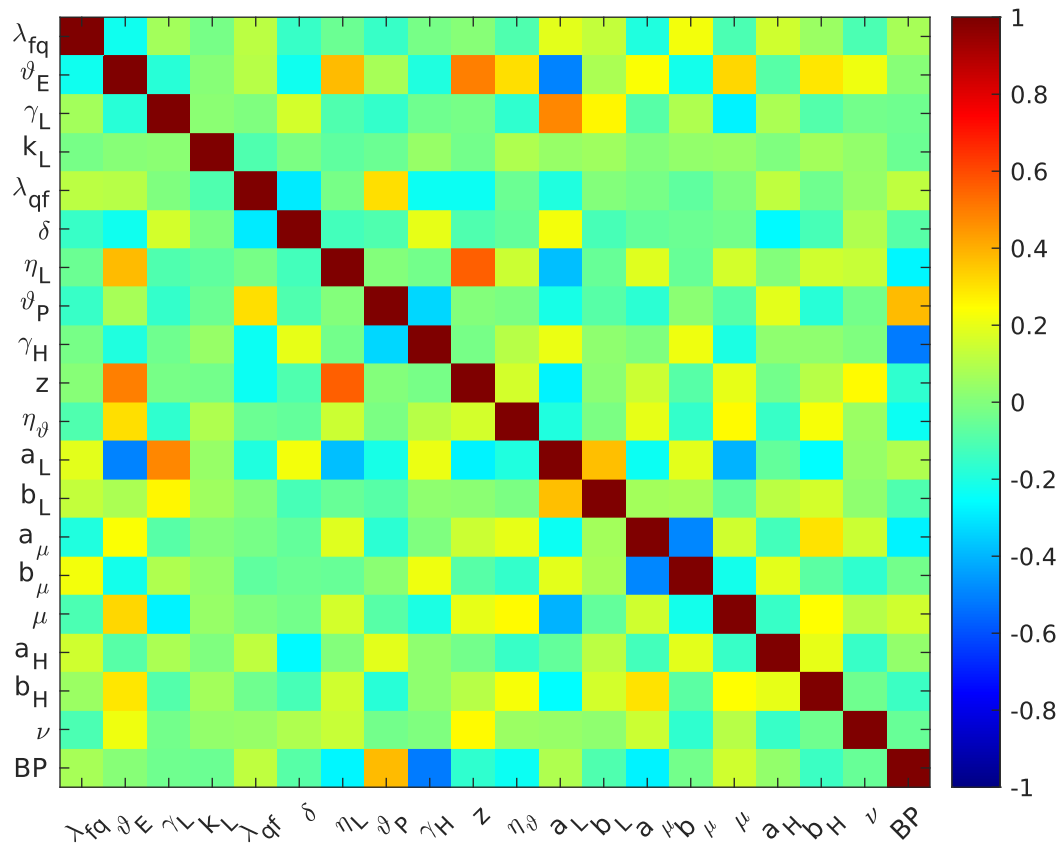
Due to a deviation from the median the CSB method was activated to obtain the parameter intervals.

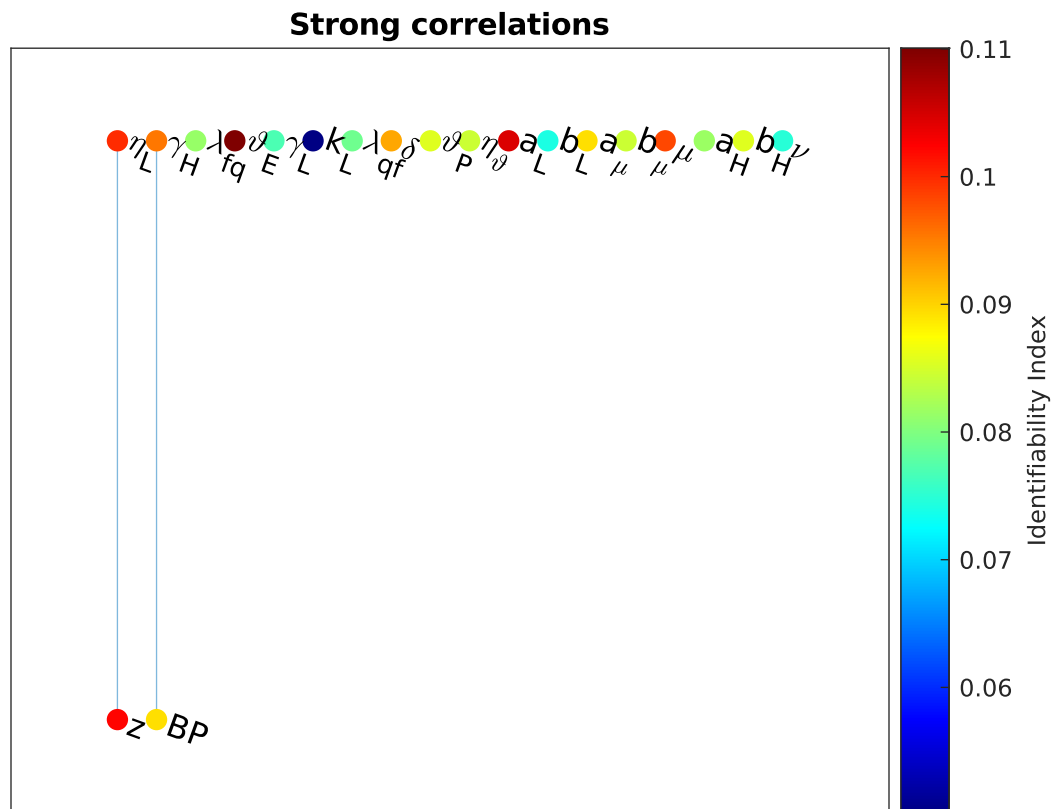
	Rango		Nominal	Mejor	Index
$\lambda_{fq}$	'0.059'	'0.0885'	'0.3831'	'0.0879'	'0.0815'
$\vartheta_E$	'0.0162'	'0.0324'	'0.701'	'0.024'	'0.1101'
$\gamma_L$	'0.4764'	'0.5323'	'0.6176'	'0.5267'	'0.0771'
$k_L$	'2.516'	'6.5417'	'5.5026'	'6.0874'	'0.0502'
$\lambda_{qf}$	'0.6919'	'0.8444'	'0.3952'	'0.6926'	'0.0791'
$\delta$	'0.0033'	'0.0067'	'0.072'	'0.0057'	'0.0926'
$\eta_L$	'0.4869'	'0.648'	'0.5578'	'0.5702'	'0.0999'
$\vartheta_P$	'0.0286'	'0.0639'	'0.2846'	'0.0301'	'0.0857'
$\gamma_H$	'0.5413'	'0.8533'	'0.6928'	'0.8502'	'0.0955'
$z$	'0.3109'	'0.3365'	'15.0006'	'0.3134'	'0.1023'
$\eta_{\vartheta}$	'0.221'	'0.2852'	'0.4866'	'0.2448'	'0.0844'
$a_L$	'1.3851'	'1.4543'	'4.4445'	'1.3856'	'0.1047'
$b_L$	'1.0332'	'1.1078'	'9.6032'	'1.1035'	'0.0743'
$a_{\mu}$	'1.2085'	'4.1195'	'9.0995'	'1.2328'	'0.0893'
$b_{\mu}$	'7.5363'	'13.457'	'6.9833'	'13.3158'	'0.0846'
$\mu$	'0.0335'	'0.0773'	'0.4073'	'0.0712'	'0.0983'
$a_H$	'11.0592'	'14.7943'	'8.4392'	'14.5948'	'0.0816'
$b_H$	'1.2855'	'10.7095'	'6.0649'	'1.5035'	'0.0856'
$\nu$	'5.8682'	'12.1541'	'263.7868'	'12.0687'	'0.0749'
BP	'667.8014'	'717.5054'	'690.4094'	'668.5'	'0.0893'



### 13.3. Identifiability analysis







### 13.4. Uncertainty analysys

