SMAC Results

Yuri Lavinas

4/16/2017

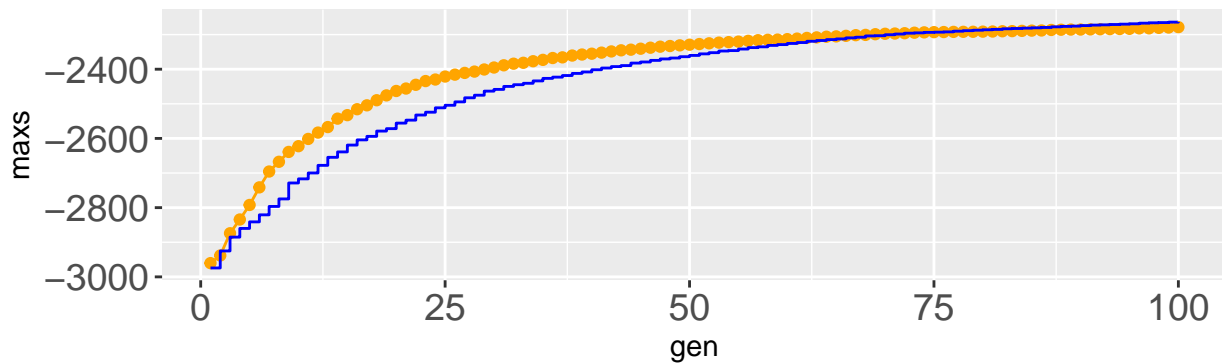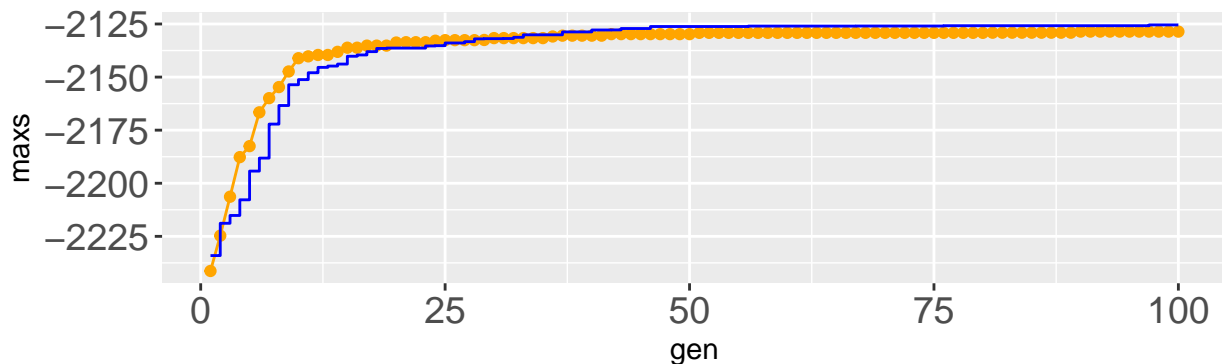# Contents

Summary

In this document we show the convergency plots for the GAModel and ReducedGAmodel with tournize size (k) 3 and tournsize (k) 2. The value of k being 2 was select by SMAC after it was executed for 2 days for both models.
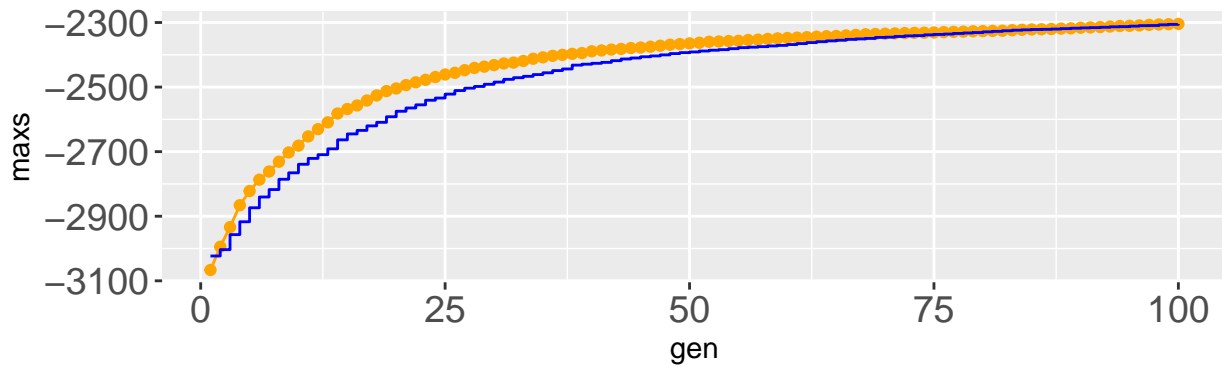
Convergency plots
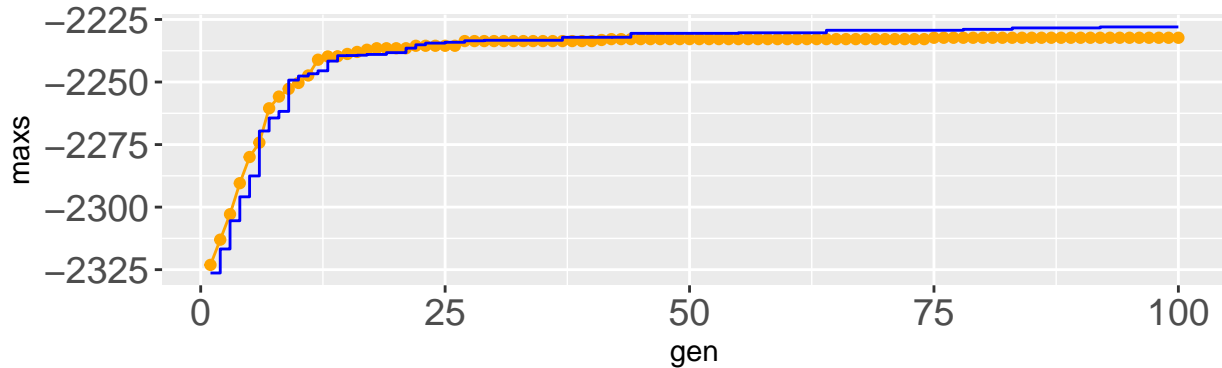
Kanto 2005 GAModel (Orange, k=3, Blue k=2)

Kanto 2005 ReducedGAModel (Orange, k=3, Blue k=2)

Kanto 2006 GAModel (Orange, k=3, Blue k=2)

Kanto 2006 ReducedGAModel (Orange, k=3, Blue k=2)

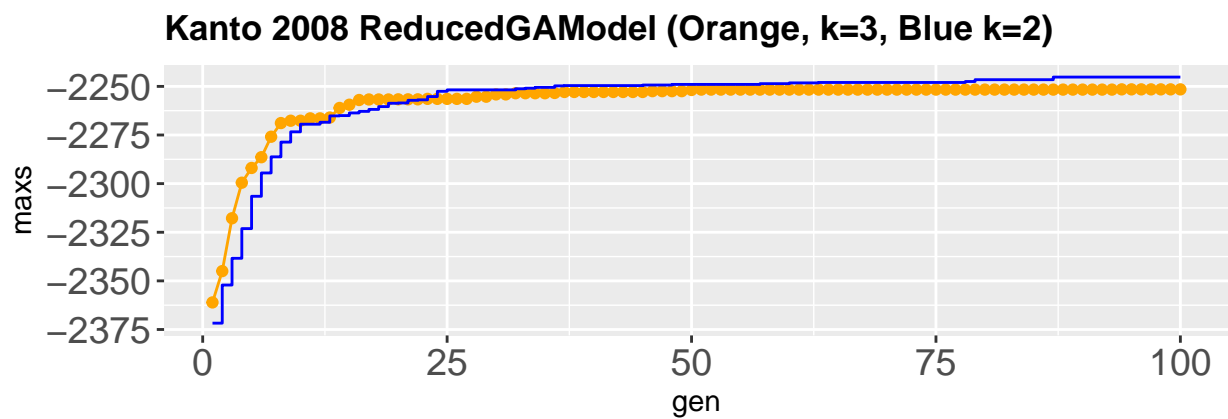**Kanto 2007 GAModel (Orange, k=3, Blue k=2)**

Kanto 2007 ReducedGAModel (Orange, k=3, Blue k=2)

Kanto 2008 GAModel (Orange, k=3, Blue k=2)

Kanto 2008 ReducedGAModel (Orange, k=3, Blue k=2)

Kanto 2009 GAModel (Orange, k=3, Blue k=2)

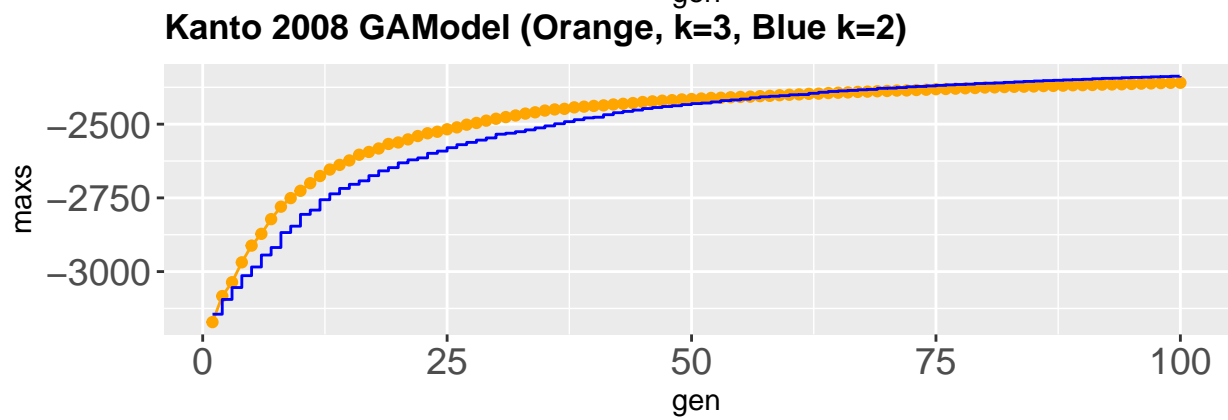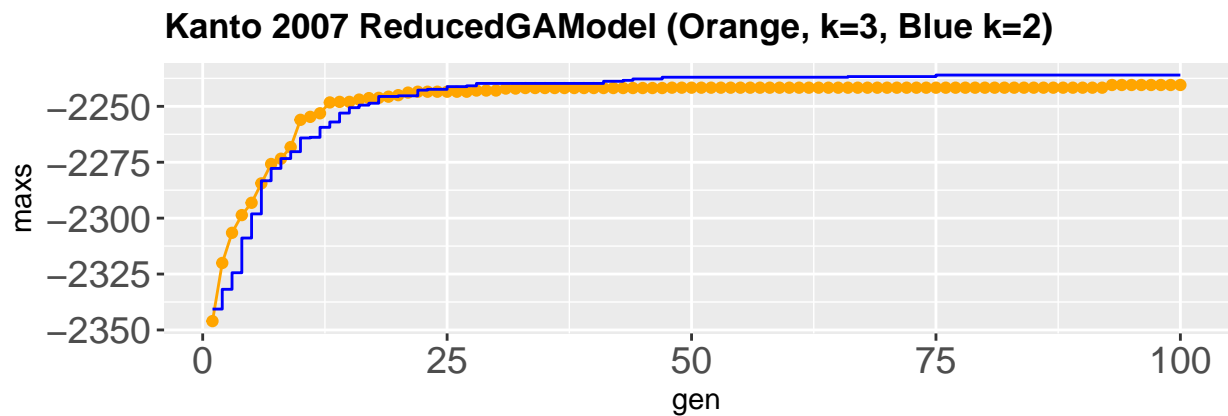**Kanto 2009 ReducedGAModel (Orange, k=3, Blue k=2)**
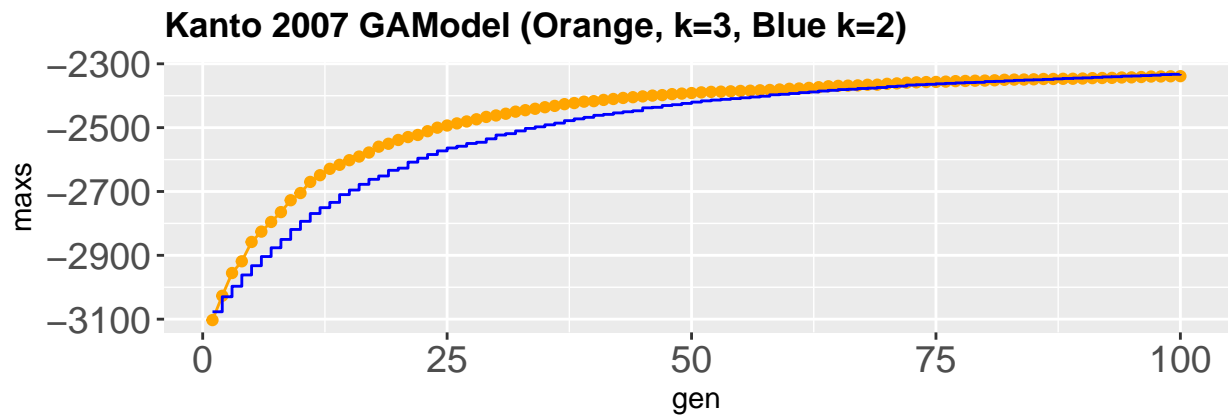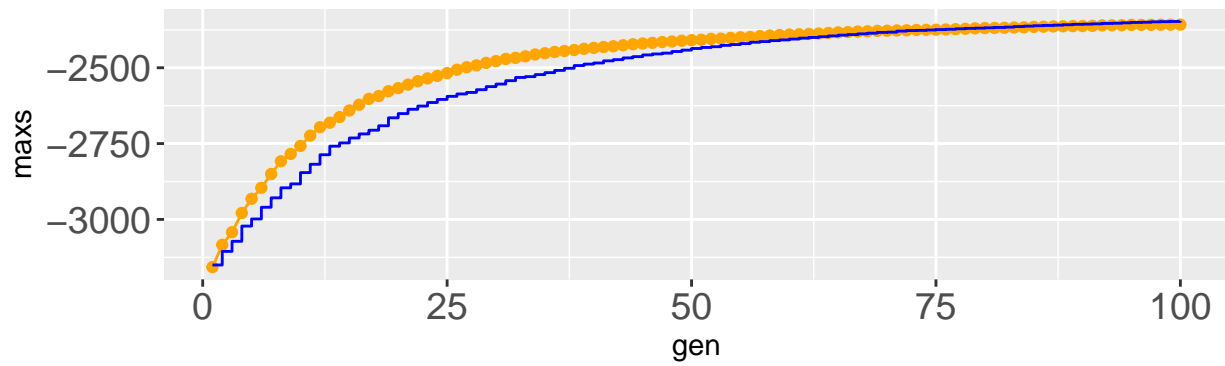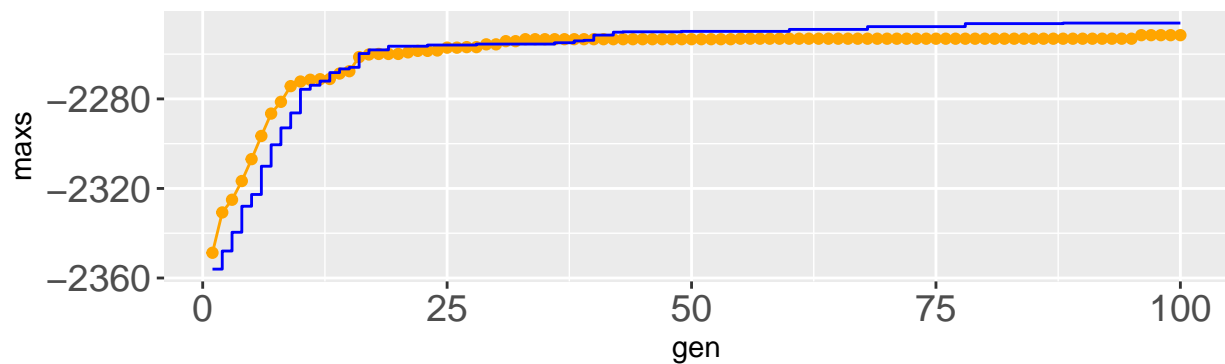
Kanto 2010 GAModel (Orange, k=3, Blue k=2)

Kanto 2010 ReducedGAModel (Orange, k=3, Blue k=2)

Kansai 2005 GAModel (Orange, k=3, Blue k=2)

Kansai 2005 ReducedGAModel (Orange, k=3, Blue k=2)

Kansai 2006 GAModel (Orange, k=3, Blue k=2)

Kansai 2006 ReducedGAModel (Orange, k=3, Blue k=2)

Kansai 2007 GAModel (Orange, k=3, Blue k=2)

Kansai 2007 ReducedGAModel (Orange, k=3, Blue k=2)

Kansai 2008 GAModel (Orange, k=3, Blue k=2)

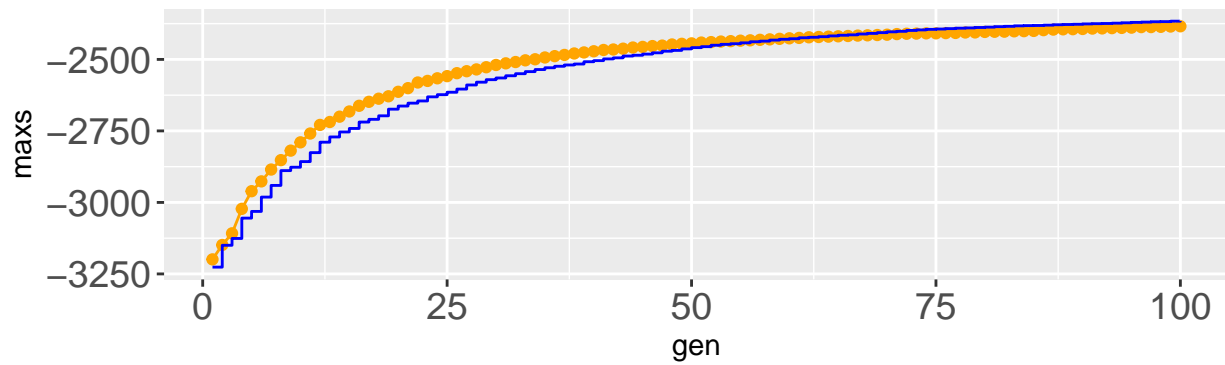**Kansai 2008 ReducedGAModel (Orange, k=3, Blue k=2)**

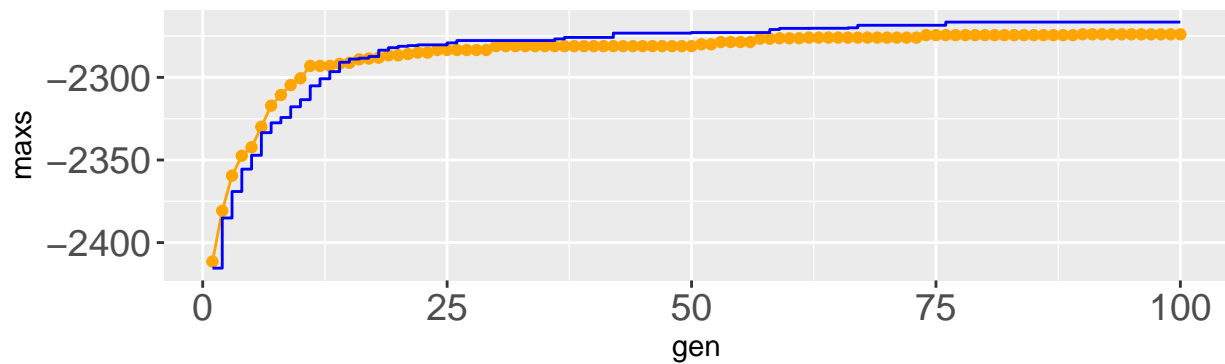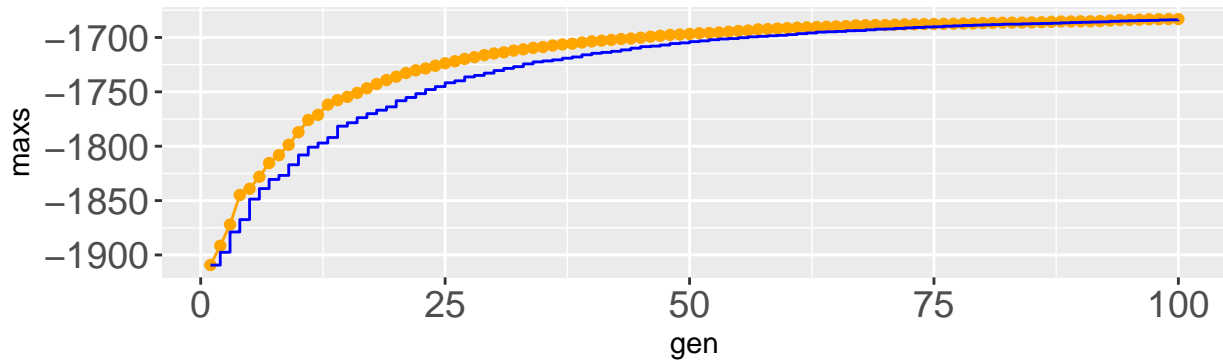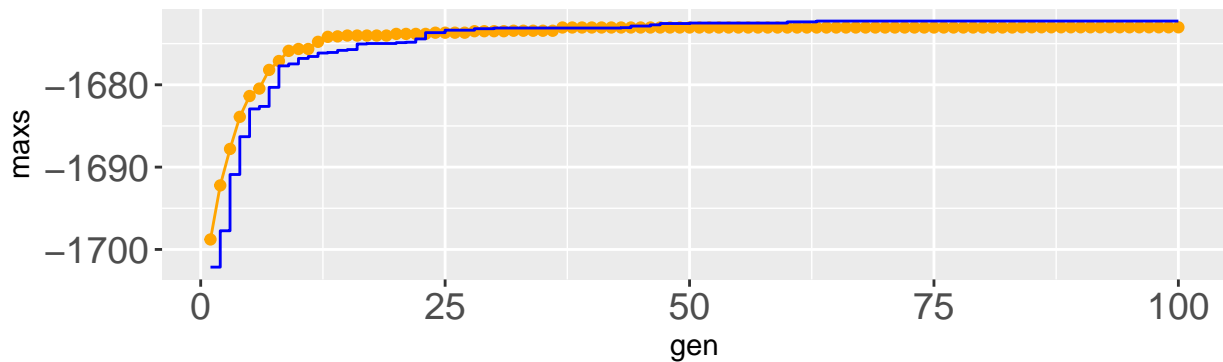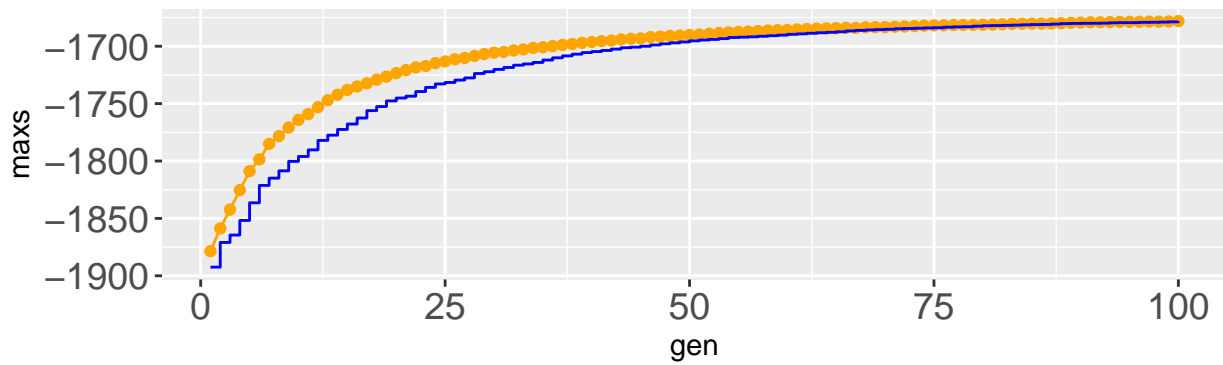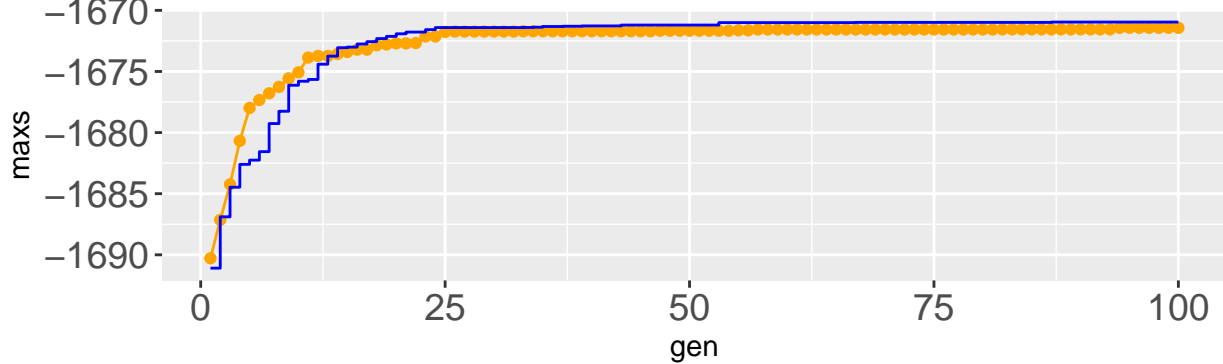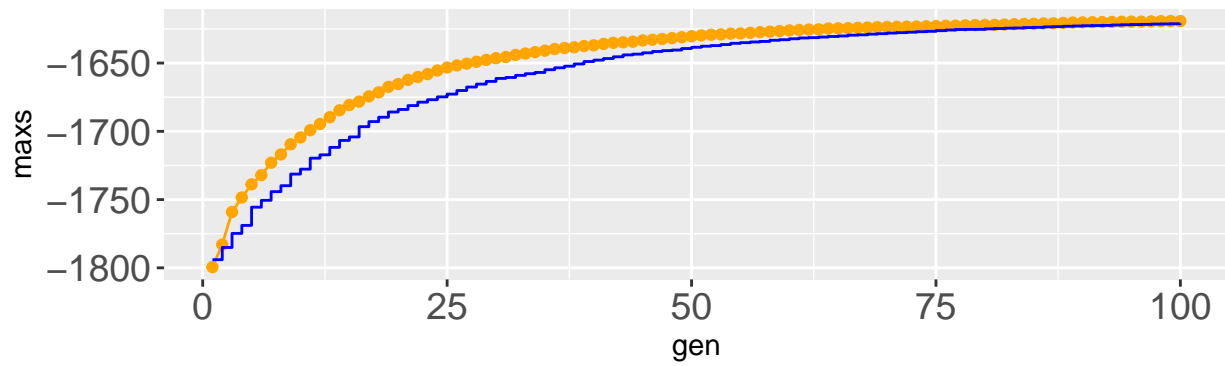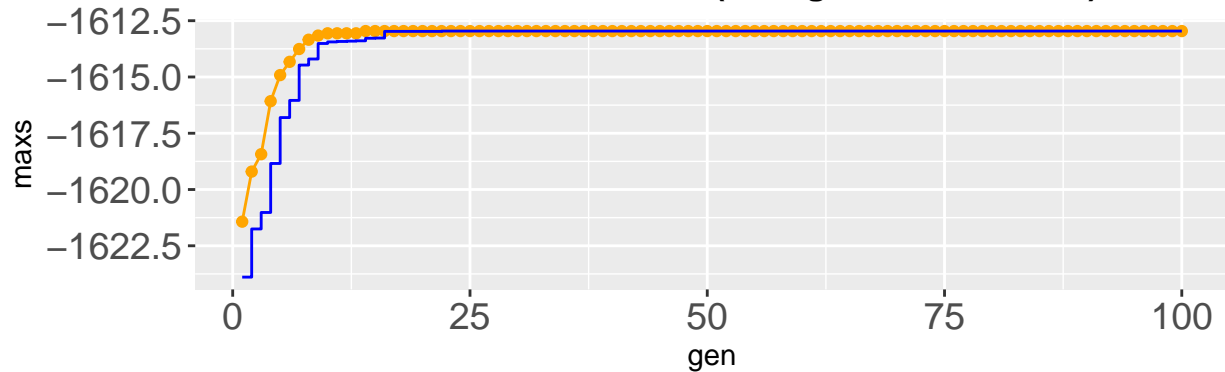## Kansai 2009 GAModel (Orange, k=3, Blue k=2)
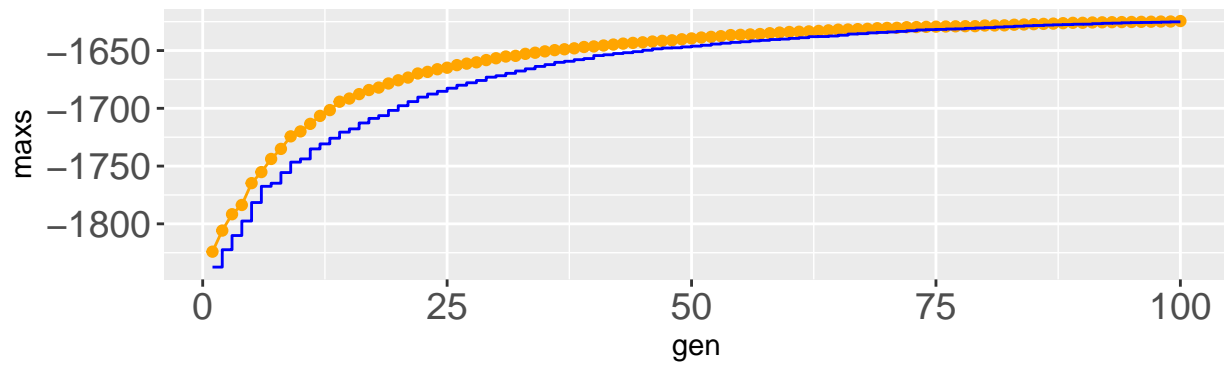
Kansai 2009 ReducedGAModel (Orange, k=3, Blue k=2)
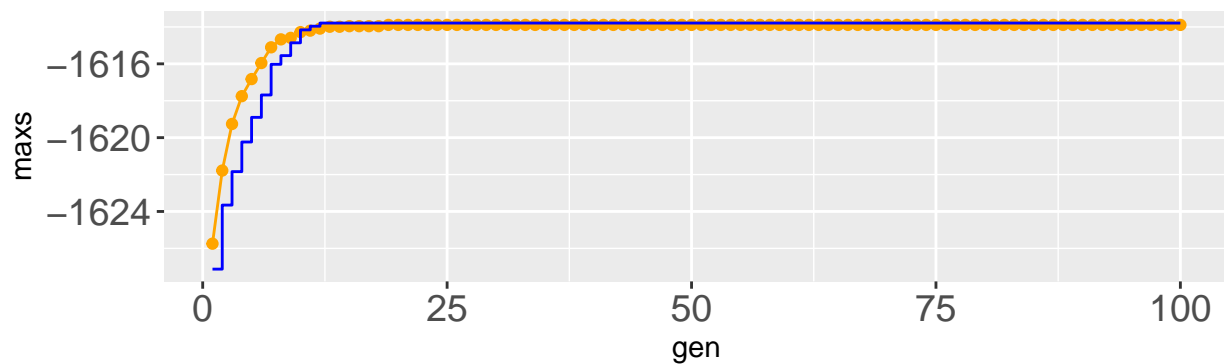
Kansai 2010 GAModel (Orange, k=3, Blue k=2)

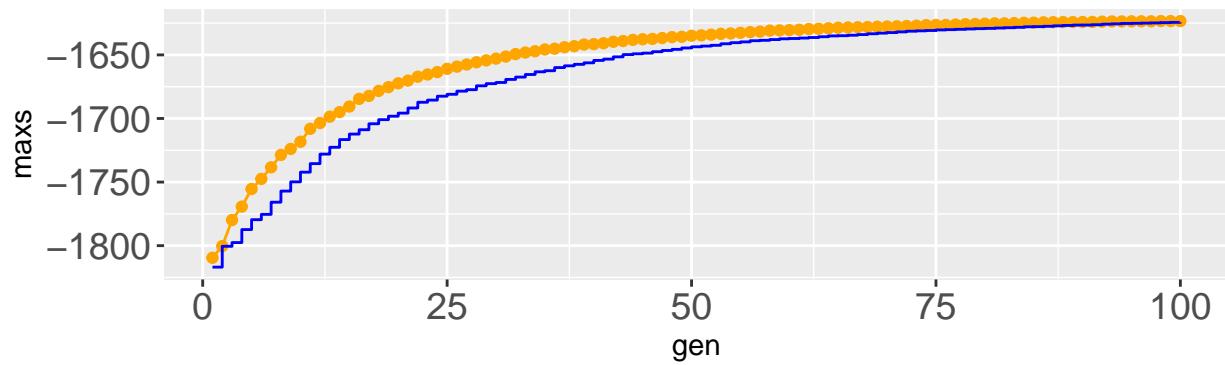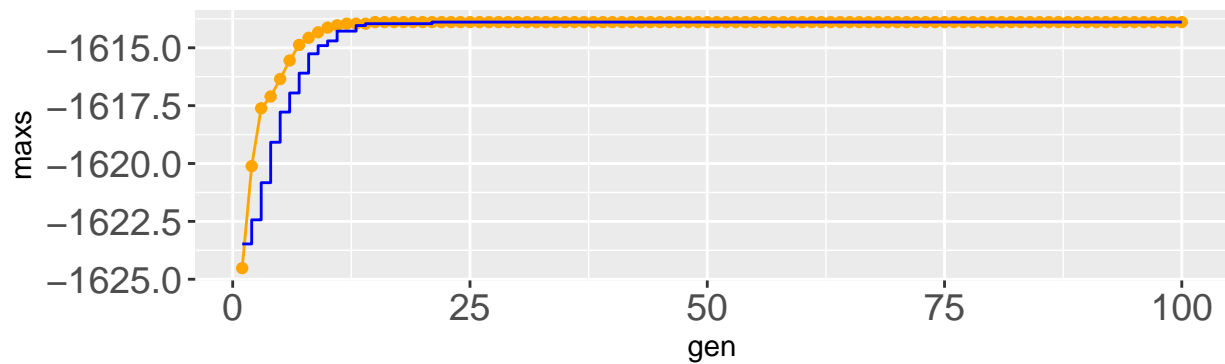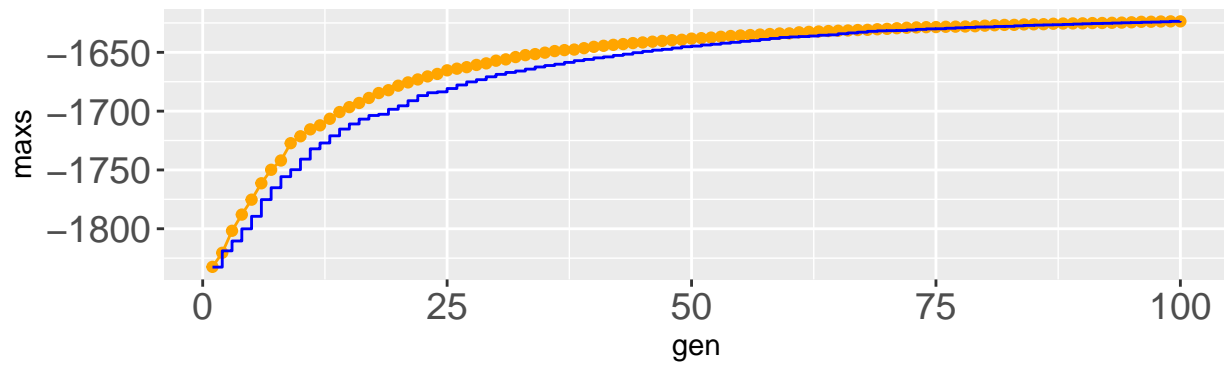## Kansai 2010 ReducedGAModel (Orange, k=3, Blue k=2)
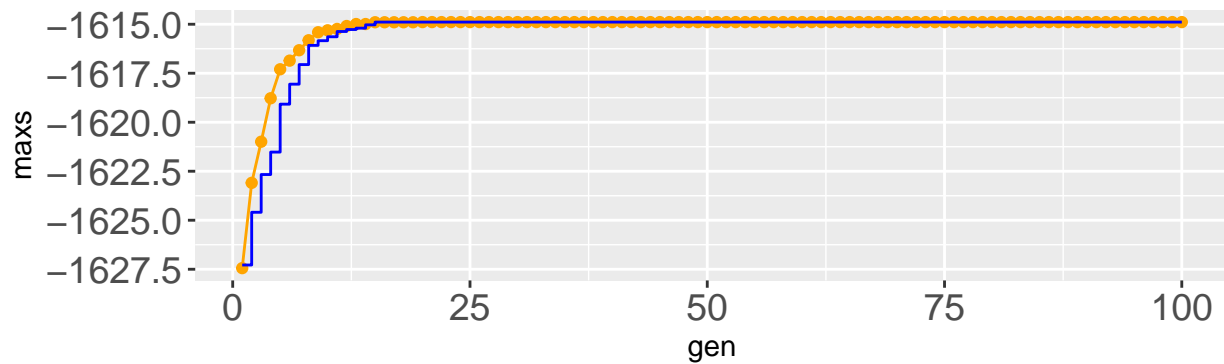
Tohoku 2005 GAModel (Orange, k=3, Blue k=2)

Tohoku 2005 ReducedGAModel (Orange, k=3, Blue k=2)

Tohoku 2006 GAModel (Orange, k=3, Blue k=2)

Tohoku 2006 ReducedGAModel (Orange, k=3, Blue k=2)
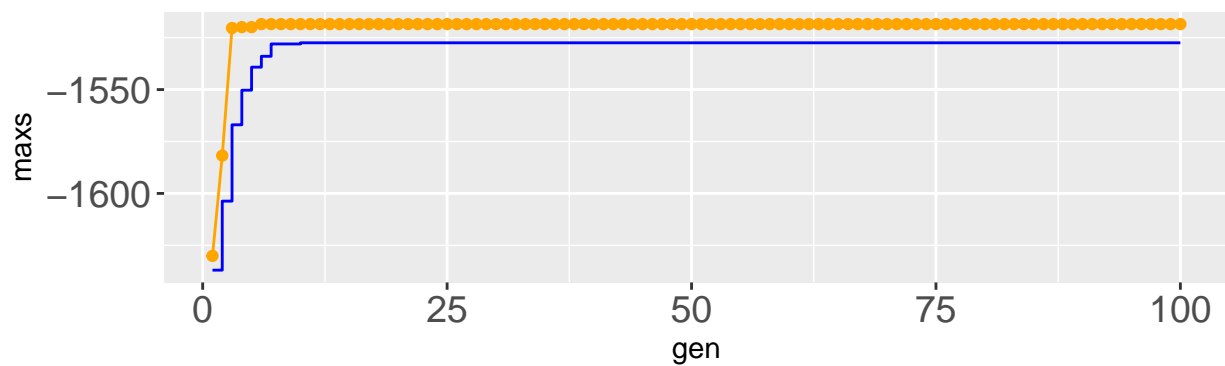
Tohoku 2007 GAModel (Orange, k=3, Blue k=2)
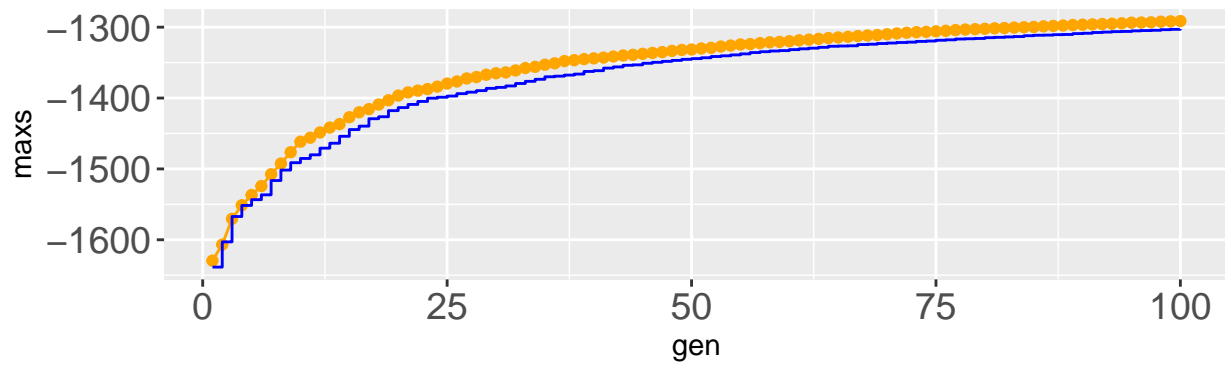
Tohoku 2007 ReducedGAModel (Orange, k=3, Blue k=2)
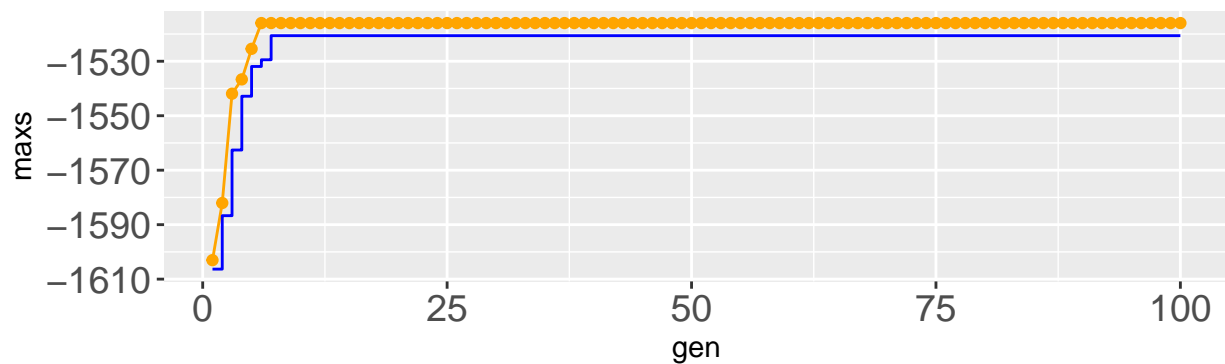
Tohoku 2008 GAModel (Orange, k=3, Blue k=2)
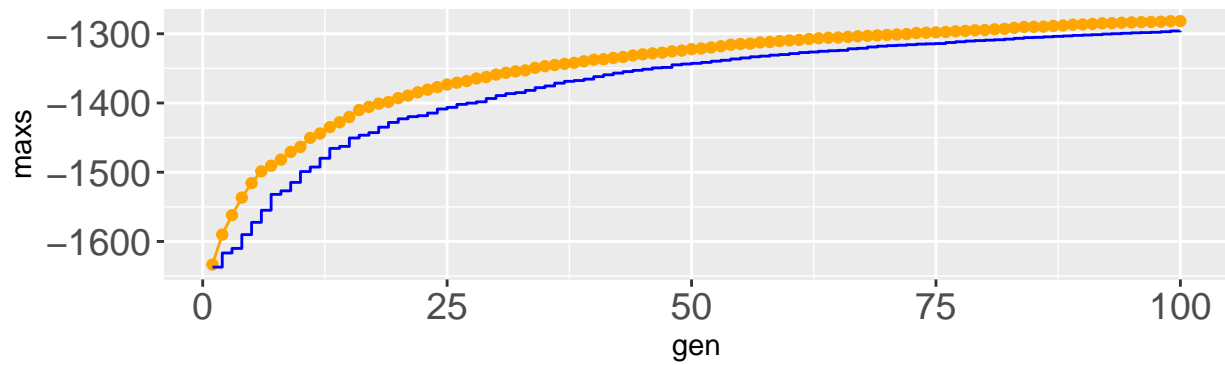
Tohoku 2008 ReducedGAModel (Orange, k=3, Blue k=2)

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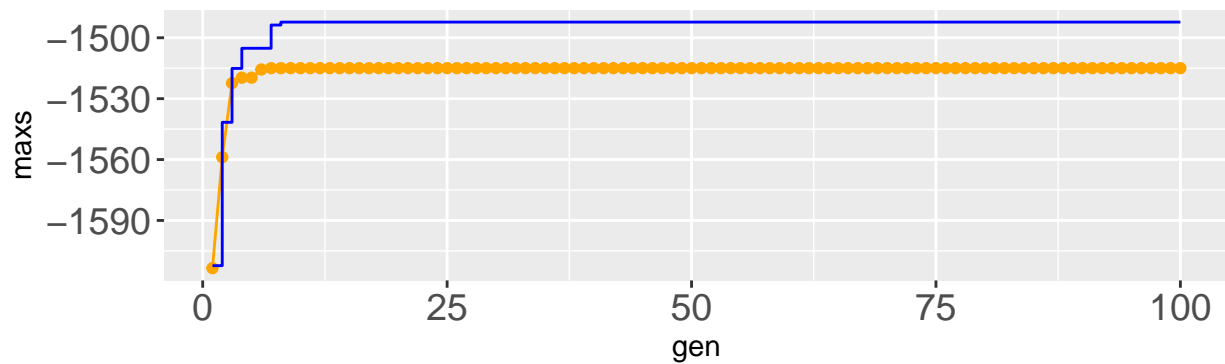
Tohoku 2009 GAModel (Orange, k=3, Blue k=2)
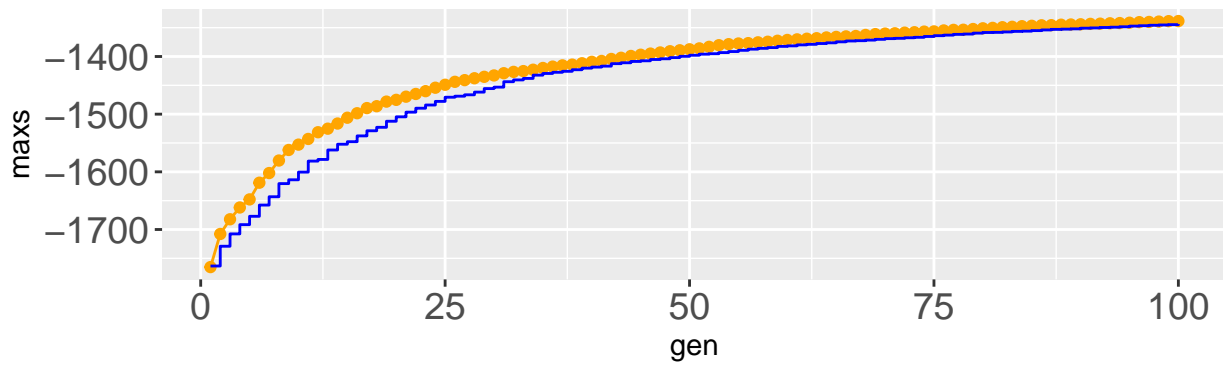
Tohoku 2009 ReducedGAModel (Orange, k=3, Blue k=2)
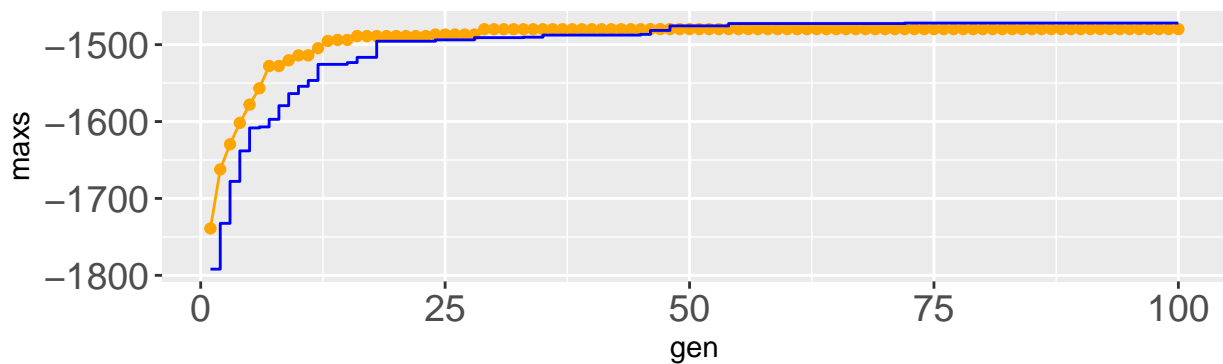
Tohoku 2010 GAModel (Orange, k=3, Blue k=2)

Tohoku 2010 ReducedGAModel (Orange, k=3, Blue k=2)

EastJapan 2005 GAModel (Orange, k=3, Blue k=2)

EastJapan 2005 ReducedGAModel (Orange, k=3, Blue k=2)

EastJapan 2006 GAModel (Orange, k=3, Blue k=2)

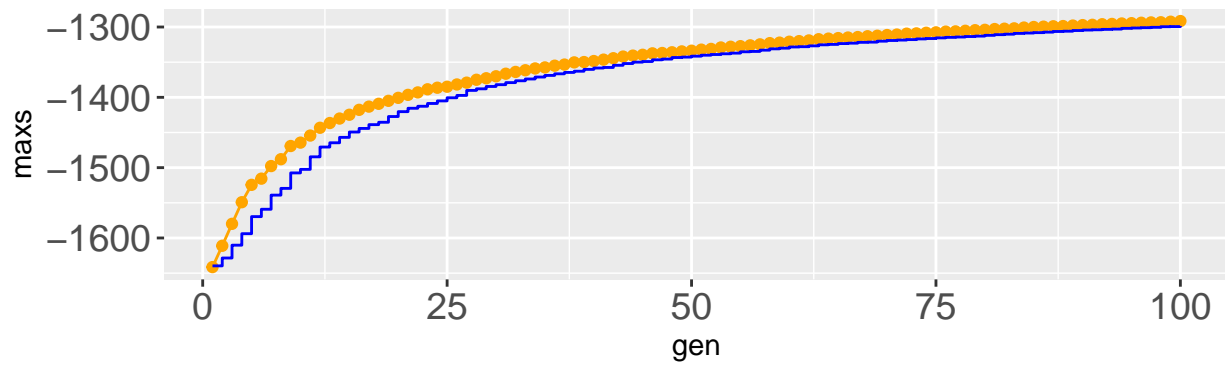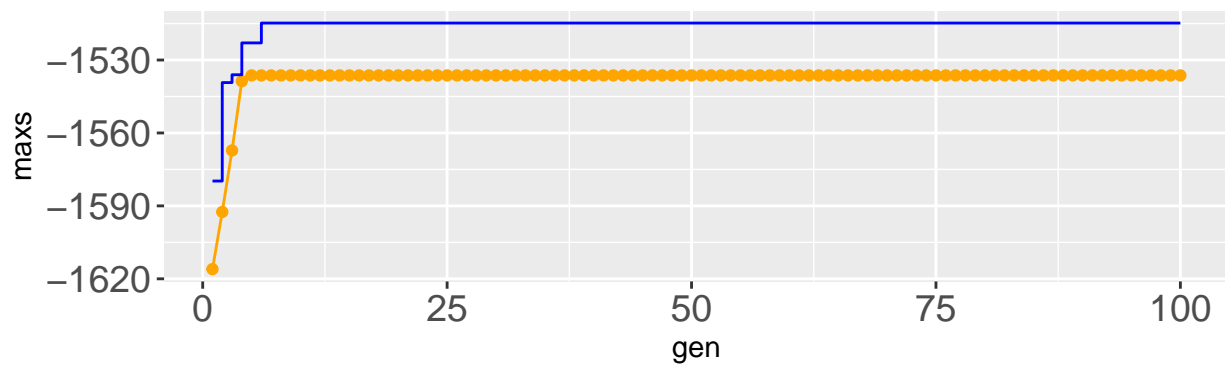**EastJapan 2006 ReducedGAModel (Orange, k=3, Blue k=2)**

EastJapan 2007 GAModel (Orange, k=3, Blue k=2)

EastJapan 2007 ReducedGAModel (Orange, k=3, Blue k=2)

EastJapan 2008 GAModel (Orange, k=3, Blue k=2)

EastJapan 2008 ReducedGAModel (Orange, k=3, Blue k=2)

EastJapan 2009 GAModel (Orange, k=3, Blue k=2)

EastJapan 2009 ReducedGAModel (Orange, k=3, Blue k=2)

EastJapan 2010 GAModel (Orange, k=3, Blue k=2)

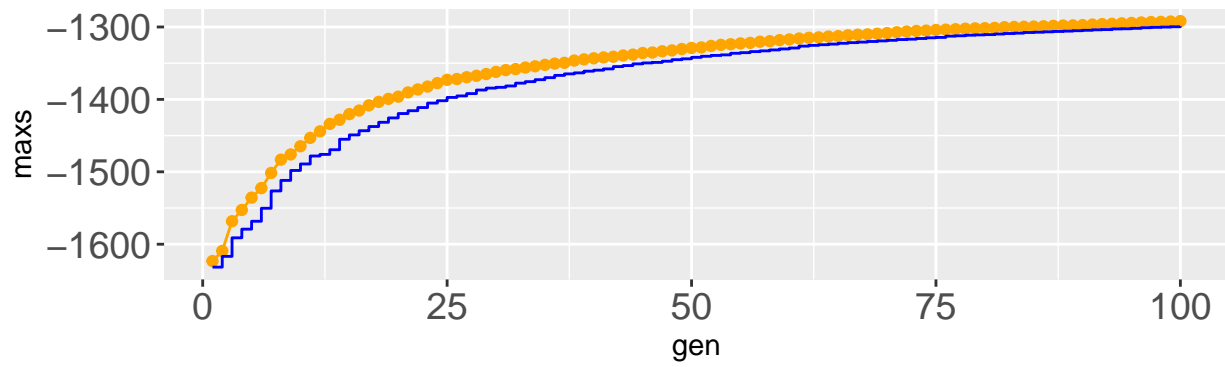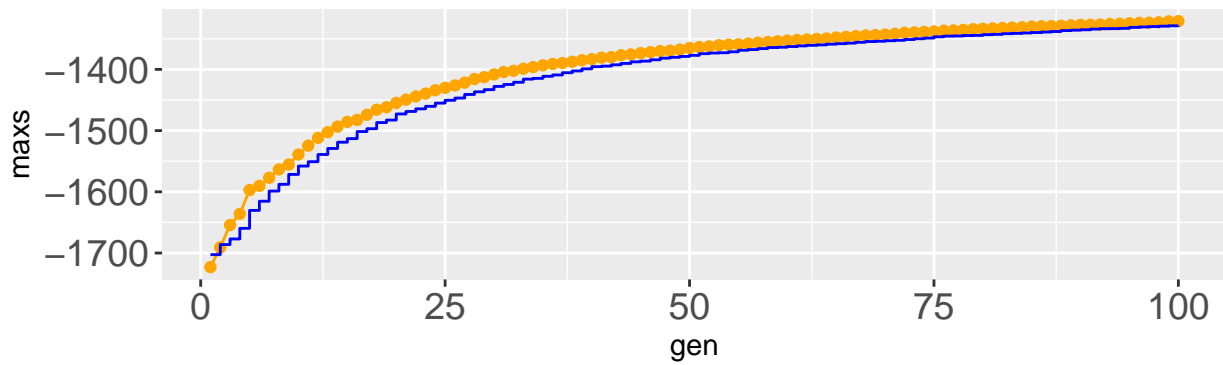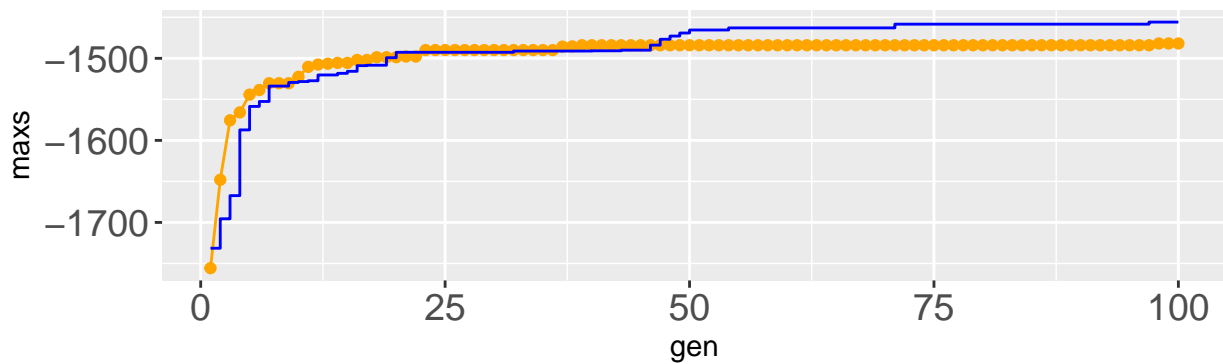## EastJapan 2010 ReducedGAModel (Orange, k=3, Blue k=2)

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ANOVA test and HSD Tukey

All regions

```
resultANOVA = aov(loglikeValues~model+years+regions, data = data)
summary(resultANOVA)
```

```
##               Df    Sum Sq   Mean Sq  F value  Pr(>F)
## model          1      3409      3409    1.972 0.16090
## years          5     26894      5379    3.111 0.00896 **
## regions        3 216542658  72180886 41751.046 < 2e-16 ***
## Residuals    470    812555      1729
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
tuk = TukeyHSD(resultANOVA)
op <- par(mar = c(5,14,4,2)+0.1)
plot(tuk,las=0)
```


95% family−wise confidence level — Differences in mean levels of model

95% family−wise confidence level — Differences in mean levels of years

95% family-wise confidence level

Differences in mean levels of regions

KANTO

```
subTabela = data[data$regions=="Kanto",]
print("In Kanto")
```

```
## [1] "In Kanto"
```

```
resultANOVA = aov(loglikeValues~model+years, data = subTabela)
summary(resultANOVA)
```

```
##               Df Sum Sq Mean Sq F value   Pr(>F)
## model          1   4397    4397   12.85 0.000499 ***
## years          5 139054   27811   81.29  < 2e-16 ***
## Residuals    113  38661     342
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
tuk = TukeyHSD(resultANOVA)
op <- par(mar = c(5,14,4,2)+0.1)
plot(tuk,las=0)
```

95% family-wise confidence level

GAModeltournsize2-GAModel

Differences in mean levels of model

95% family-wise confidence level

Differences in mean levels of years

EASTJAPAN

```
subTabela2 = data[data$regions=="EastJapan",]
print("In EastJapan")
```

```
## [1] "In EastJapan"
```
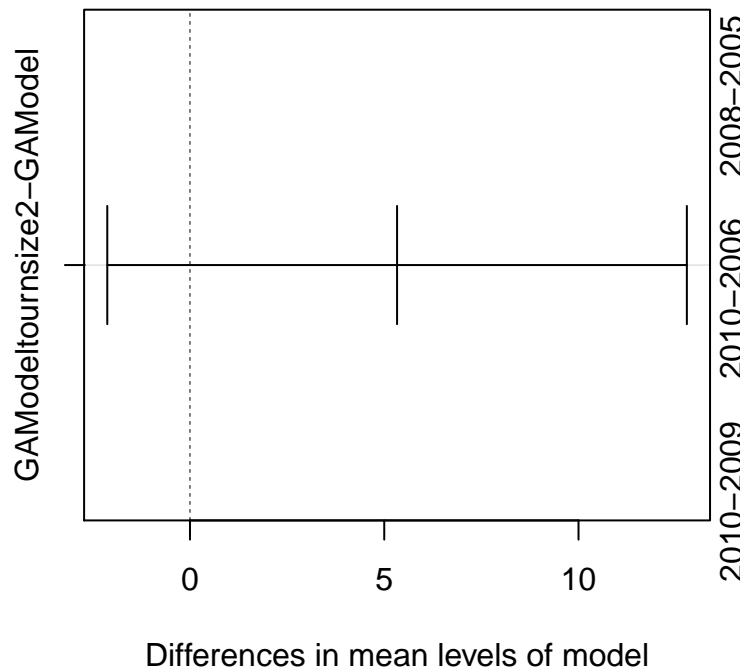
```
resultANOVA = aov(loglikeValues~model+years, data = subTabela2)
summary(resultANOVA)
```

```
##               Df Sum Sq Mean Sq F value   Pr(>F)
## model          1  10522   10522    2.91 0.090773 .
## years          5  97986   19597    5.42 0.000166 ***
## Residuals    113 408578    3616
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
tuk = TukeyHSD(resultANOVA)
op <- par(mar = c(5,14,4,2)+0.1)
plot(tuk,las=0)
```
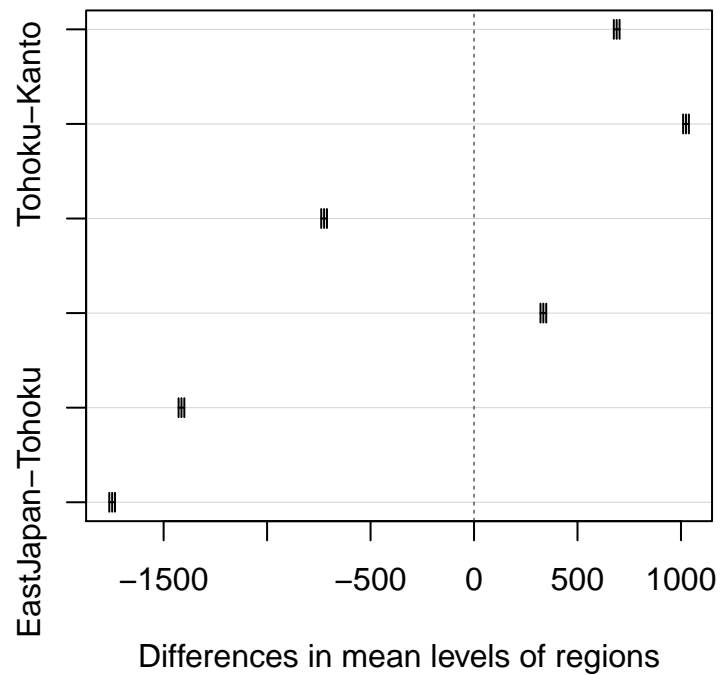
95% family–wise confidence level

Differences in mean levels of model

95% family–wise confidence level

Differences in mean levels of years

```r
subTabela3 = data[data$regions=="Kansai",]
print("In Kansai")
```
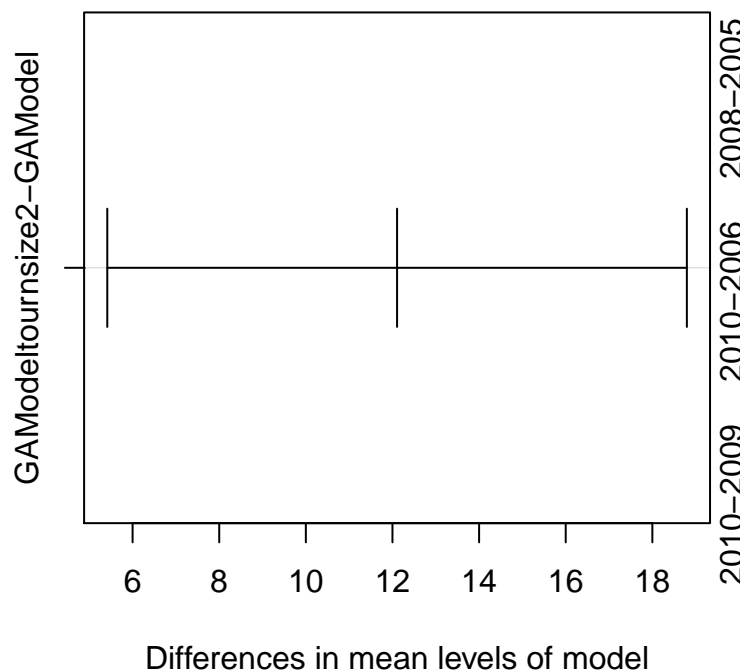
```
## [1] "In Kansai"
```

```r
resultANOVA = aov(loglikeValues~model+years, data = subTabela3)
summary(resultANOVA)
```
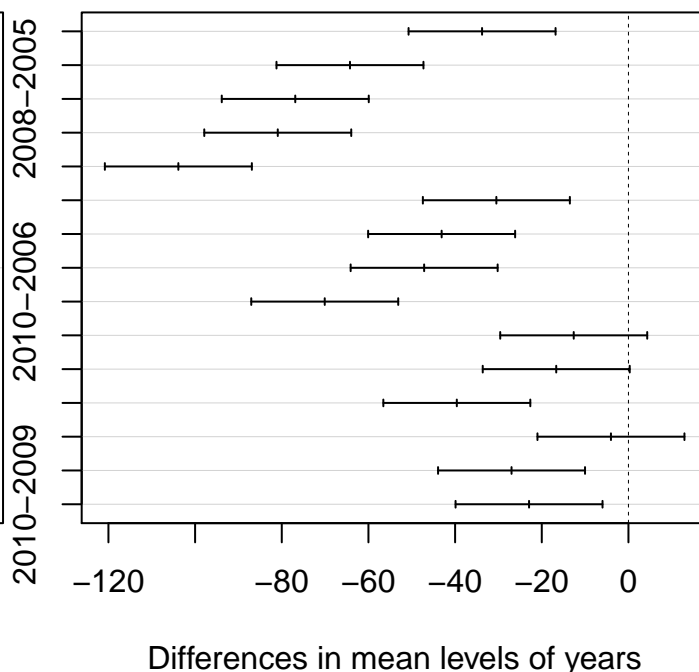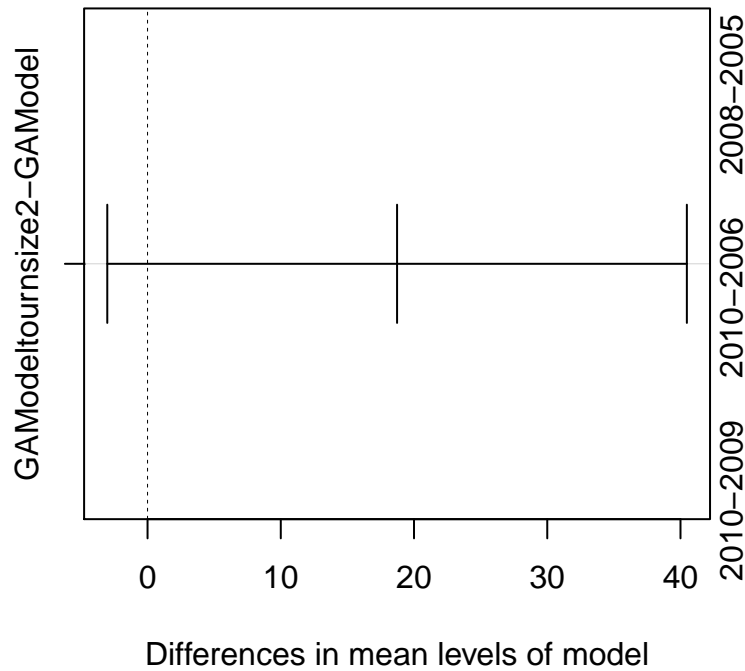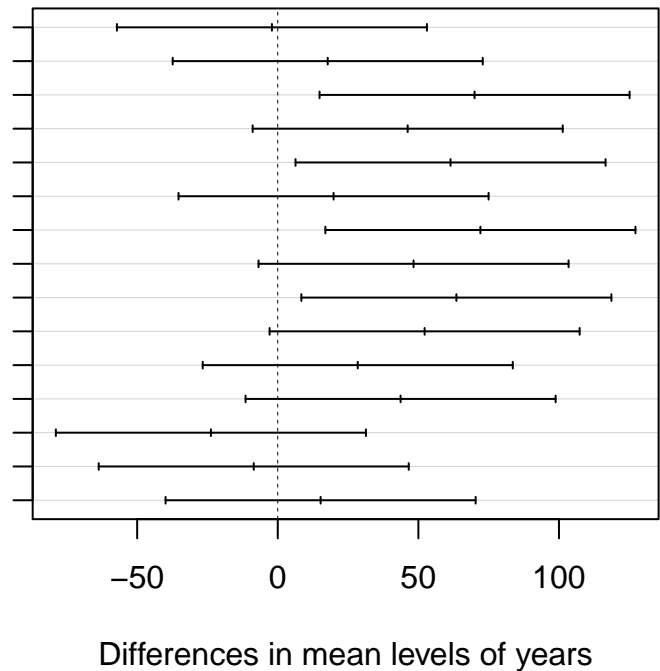
```
##              Df Sum Sq Mean Sq  F value Pr(>F)
## model         1     15      15    1.617  0.206
## years         5  89623   17925 1877.966 <2e-16 ***
## Residuals   113   1079      10
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
tuk = TukeyHSD(resultANOVA)
op <- par(mar = c(5,14,4,2)+0.1)
plot(tuk,las=0)
```

95% family−wise confidence level　　　　**95% family−wise confidence level**

Differences in mean levels of model　　　Differences in mean levels of years

TOHOKU

```r
subTabela3 = data[data$regions=="Tohoku",]
print("In Tohoku")
```
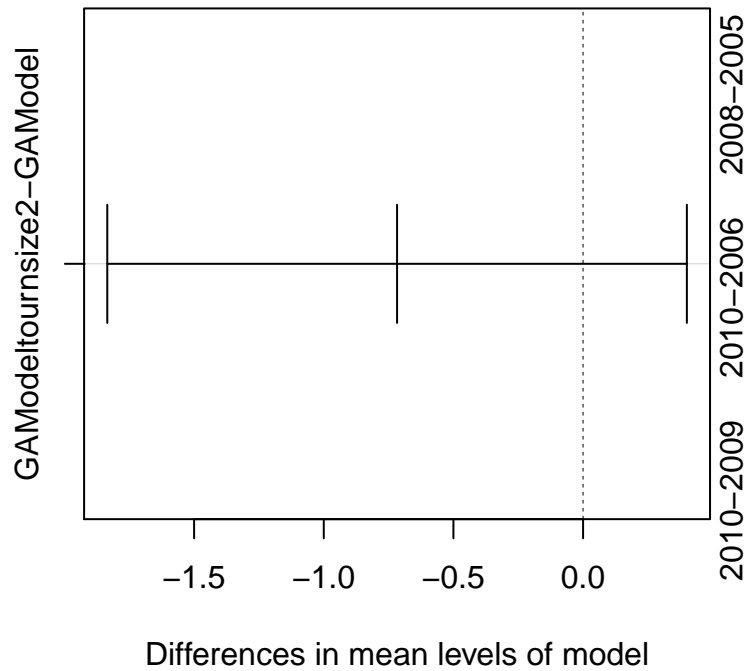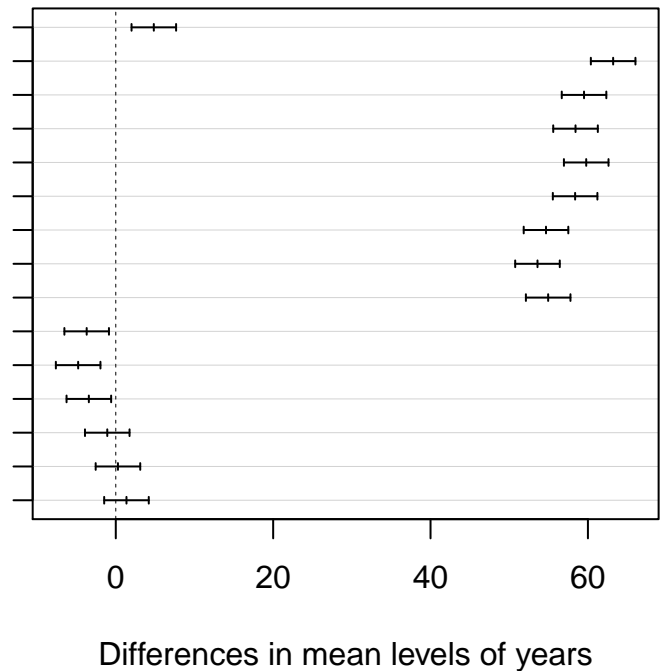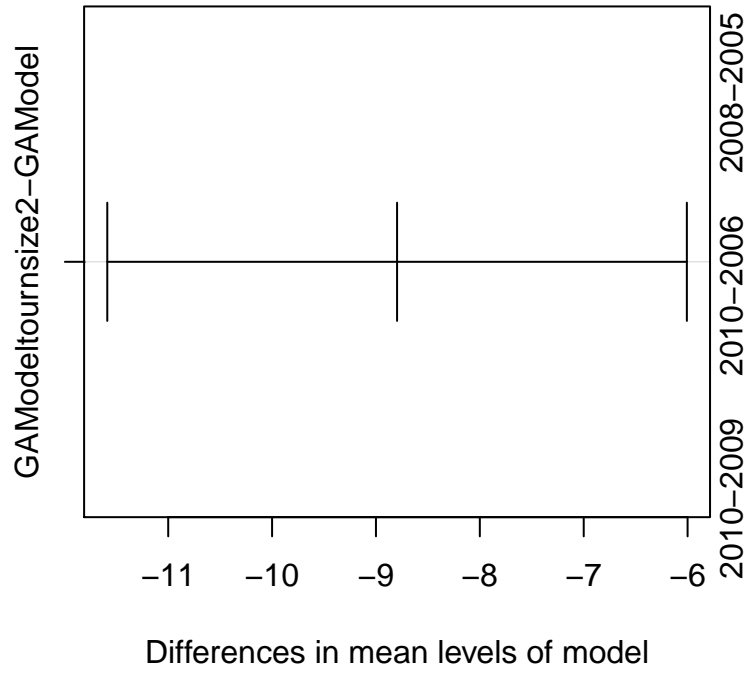
```
## [1] "In Tohoku"
```

```r
resultANOVA = aov(loglikeValues~model+years, data = subTabela3)
summary(resultANOVA)
```

```
##               Df Sum Sq Mean Sq F value   Pr(>F)
## model          1   2321    2321   39.02 7.59e-09 ***
## years          5  43900    8780  147.60  < 2e-16 ***
## Residuals    113   6722      59
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
tuk = TukeyHSD(resultANOVA)
op <- par(mar = c(5,14,4,2)+0.1)
plot(tuk,las=0)
```

95% family−wise confidence level

GAModeltournsize2−GAModel

−11 −10 −9 −8 −7 −6

Differences in mean levels of model

95% family−wise confidence level

2008−2005
2010−2006
2010−2009

−60 −40 −20 0 20

Differences in mean levels of years