Relatorio

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Carregar arquivo de dados

```r
# Cargamos el fichero de datos
# Debe tener una estructura igual a este, es decir,
# que las coordenadas X e Y estan en las columnas 3 y 5
# (la X) y 4 y 6 (la Y)
# Nombre del fichero de datos
fichero <- "Estatistica_8PCT.csv"
dados <- read.csv(fichero, header=TRUE, sep=";", dec=",")
dados[,2] <- 0
```

Calcular os erros em X e Y

```r
puncontrol <- list()
for (i in 1:100) {
  x <- (i-1)*35+1
  puncontrol[[i]] <- dados[x:(x+33), ]
  # Calculamos los errores en X e Y
  puncontrol[[i]]$E_X <- puncontrol[[i]][,5]- puncontrol[[i]][,3]
  puncontrol[[i]]$E_Y <- puncontrol[[i]][,6]- puncontrol[[i]][,4]
}
```

Estatísticas Básicas

```r
basicStats(puncontrol[[1]]$E_X)
```

```
X..puncontrol..1...E_X
nobs   34.000000
NAs   0.000000
Minimum   -0.173100
Maximum   1.305800
1. Quartile   -0.007675
3. Quartile   0.017825
Mean   0.035453
Median   0.007050
Sum   1.205400
SE Mean   0.038992
LCL Mean   -0.043878
UCL Mean   0.114784
Variance   0.051694
Stdev   0.227363
```

```
## Skewness                    5.100687
## Kurtosis                    25.686467
```

```
basicStats(puncontrol[[1]]$E_Y)
```

```
##              X..puncontrol..1...E_Y
## nobs                     34.000000
## NAs                       0.000000
## Minimum                  -0.377000
## Maximum                   0.171000
## 1. Quartile               0.004250
## 3. Quartile               0.054750
## Mean                      0.020559
## Median                    0.031000
## Sum                       0.699000
## SE Mean                   0.013669
## LCL Mean                 -0.007250
## UCL Mean                  0.048368
## Variance                  0.006352
## Stdev                     0.079701
## Skewness                 -3.433967
## Kurtosis                 15.613346
```

```
hist(puncontrol[[1]]$E_X, main="X", xlab="Errores en X", ylab="Frecuencia")
hist(puncontrol[[1]]$E_Y, main="Y", xlab="Errores en Y", ylab="Frecuencia")
```
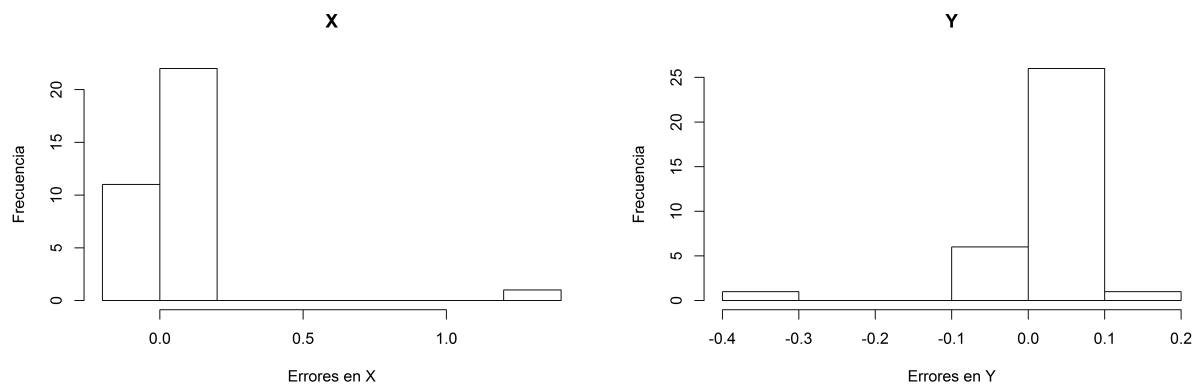


```
plot(puncontrol[[1]][,3], puncontrol[[1]][,4] ,
     main="Distribución  espacial de los puntos de evaluación",
     xlab="X", ylab="Y")
```

**Distribución espacial de los puntos de evaluación**
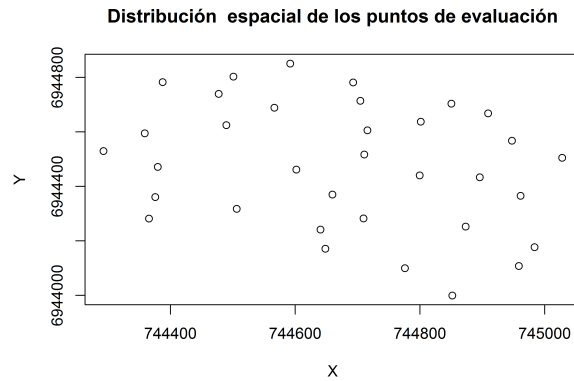

```
# Cambia este factor según necesites
fescala <- 1000
plot(puncontrol[[1]][,3], puncontrol[[1]][,4],
     main="Campo de errores ", xlab="X", ylab="Y")
arrows(puncontrol[[1]][,3],
       puncontrol[[1]][,4],
       puncontrol[[1]][,3] + fescala*puncontrol[[1]]$E_X,
       puncontrol[[1]][,4] + fescala* puncontrol[[1]]$E_Y,
       col= 'dark red', length = 0.1, angle = 15)
```

Campo de errores
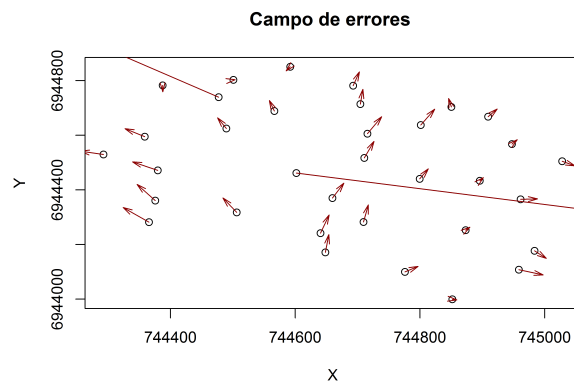

```
# Cambia el factor de escala circular según necesites
fescalaCir <- 2
datos_cir2d <- circular(atan2(puncontrol[[1]]$E_Y, puncontrol[[1]]$E_X))
modulo2d <- sqrt(puncontrol[[1]]$E_X^2+puncontrol[[1]]$E_Y^2)
plot.circular(datos_cir2d)
title(main="Distribución circular de erores", xlab="X", ylab="Y")
segments(0, 0,
         fescalaCir*puncontrol[[1]]$E_X,
         fescalaCir* puncontrol[[1]]$E_Y,
         col= 'dark red')
```

Distribución circular de erores
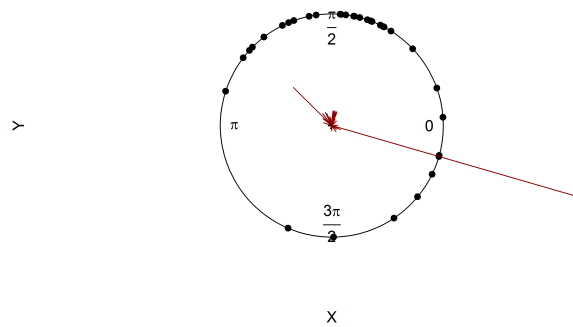


```
QCoH_RANDOMNESS(puncontrol[[1]][c(7,8)])
```

```
## [1] "El resultado del test de aleaoriedad para X: "
##
##   Runs Test
##
## data:  errorespos[, 1]
## statistic = -1.7416, runs = 13, n1 = 17, n2 = 17, n = 34, p-value
## = 0.08158
## alternative hypothesis: nonrandomness
##
## [1] "El resultado del test de aleaoriedad para Y: "
##
##   Runs Test
##
## data:  errorespos[, 2]
## statistic = -3.1348, runs = 9, n1 = 17, n2 = 17, n = 34, p-value =
## 0.001719
## alternative hypothesis: nonrandomness
```

```
QCoH_OUTLIERS(puncontrol[[1]][c(7,8)])
```

```
## [1] "El número de casos fuera de rango en X es:  1"
## [1] "El número de casos fuera de rango en Y es:  0"
```
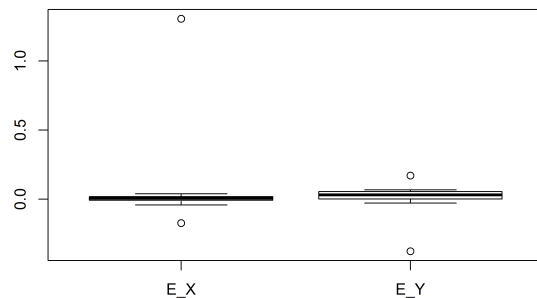


```
QCoH_NORMALITY_G(puncontrol[[1]][c(7,8)])
```

X   **Y**
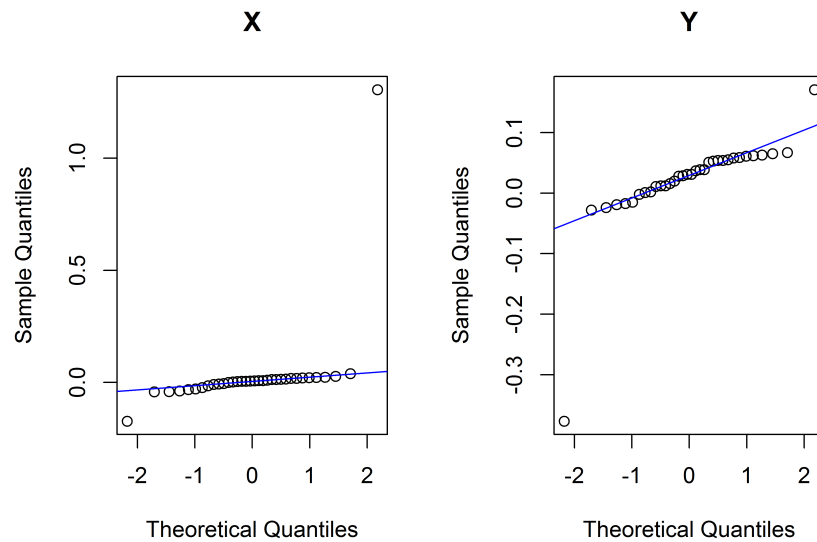

```
QCoH_NORMALITY_A_KS(puncontrol[[1]][c(7,8)])
```

```
## Warning in ks.test(x, "pnorm", alternative = "two.sided"): ties should not
## be present for the Kolmogorov-Smirnov test

## Warning in ks.test(x, "pnorm", alternative = "less"): ties should not be
## present for the Kolmogorov-Smirnov test

## Warning in ks.test(x, "pnorm", alternative = "greater"): ties should not be
## present for the Kolmogorov-Smirnov test

##
## Title:
##  Normality test
##
## Test Results:
##    STATISTIC:
##      D: 0.455
##    P VALUE:
##      Alternative Two-Sided: 5.956e-07
##      Alternative        Less: 3.181e-07
##      Alternative     Greater: 2.978e-07
##
## Description:
##  X coordinate
##
##
## Title:
##  Normality test
##
## Test Results:
##    STATISTIC:
##      D: 0.4594
##    P VALUE:
##      Alternative Two-Sided: 1.169e-06
##      Alternative        Less: 5.845e-07
```
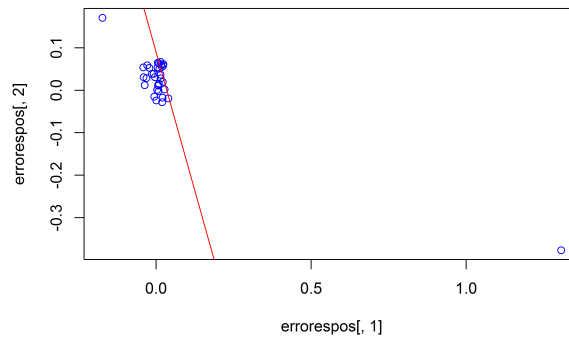
```
##      Alternative   Greater: 1.518e-06
##
## Description:
##   Y coordinate
```

```
QCoH_HOMOCEDAS_BAR(puncontrol[[1]][c(7,8)])
```

```
##
## Title:
##   Bartlett Test for Homogeneity of Variances
##
## Test Results:
##    STATISTIC:
##      Bartlett's Chi-squared: 30.6228
##    P VALUE:
##      3.134e-08
##
## Description:
##   Thu Jul 18 12:44:32 2019
```

```
QCoH_CORRELATION_G(puncontrol[[1]][c(7,8)])
```



```
QCoH_CORRELATION_A(puncontrol[[1]][c(7,8)])
```

```
##             E_X          E_Y
## E_X   1.0000000 -0.9164776
## E_Y  -0.9164776  1.0000000
```

```
QCoH_CORRELATION_A_SPR(puncontrol[[1]][c(7,8)])
```

```
## Warning in cor.test.default(errorespos[, 1], errorespos[, 2], method =
## "spearman"): Cannot compute exact p-value with ties
```

```
##
##   Spearman's rank correlation rho
##
## data:  errorespos[, 1] and errorespos[, 2]
## S = 8023.3, p-value = 0.199
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##        rho
## -0.225873
```