

```
plot.ts(rainforecasts2$residuals)
```

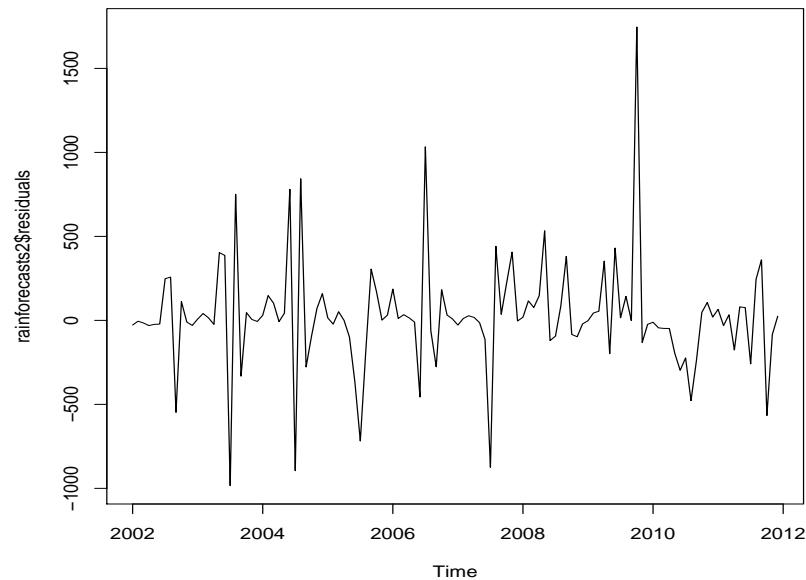


Figure 4.10: Plot of the in-sample forecast errors.

The plot shows that the in-sample forecast errors seem to have roughly constant variance over time with some fluctuations between 2000 and 2011.

To check whether the forecast errors are normally distributed with mean zero, a histogram of the forecast errors, with an overlaid normal curve that has mean zero and the same standard deviation as the distribution of forecast errors can be plotted. Here the R function `plotForecastErrors()` was used.

```
plotForecastErrors <- function(forecasterrors) {  
  # make a red histogram of the forecast errors:  
  mybinsize <- IQR(forecasterrors)/4  
  mymin <- min(forecasterrors) * 3  
  mymax <- max(forecasterrors) * 3  
  mybins <- seq(mymin, mymax, mybinsize)  
  hist(forecasterrors, col = "red", freq = FALSE, breaks = mybins)  
  # freq=FALSE ensures the area under the histogram = 1  
  mysd <- sd(forecasterrors)  
  # generate normally distributed data with mean 0 and standard deviation  
  # mysd  
  mynorm <- rnorm(10000, mean = 0, sd = mysd)  
  myhist <- hist(mynorm, plot = FALSE, breaks = mybins)  
  # plot the normal curve as a blue line on top of the histogram of  
  # forecast errors:  
  points(myhist$mids, myhist$density, type = "l", col = "blue", lwd = 2)  
}
```