

Respiratory Rate Determination by Non-Invasive Means

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1 Introduction

1.1 Background

(Penzel et al., 2000).

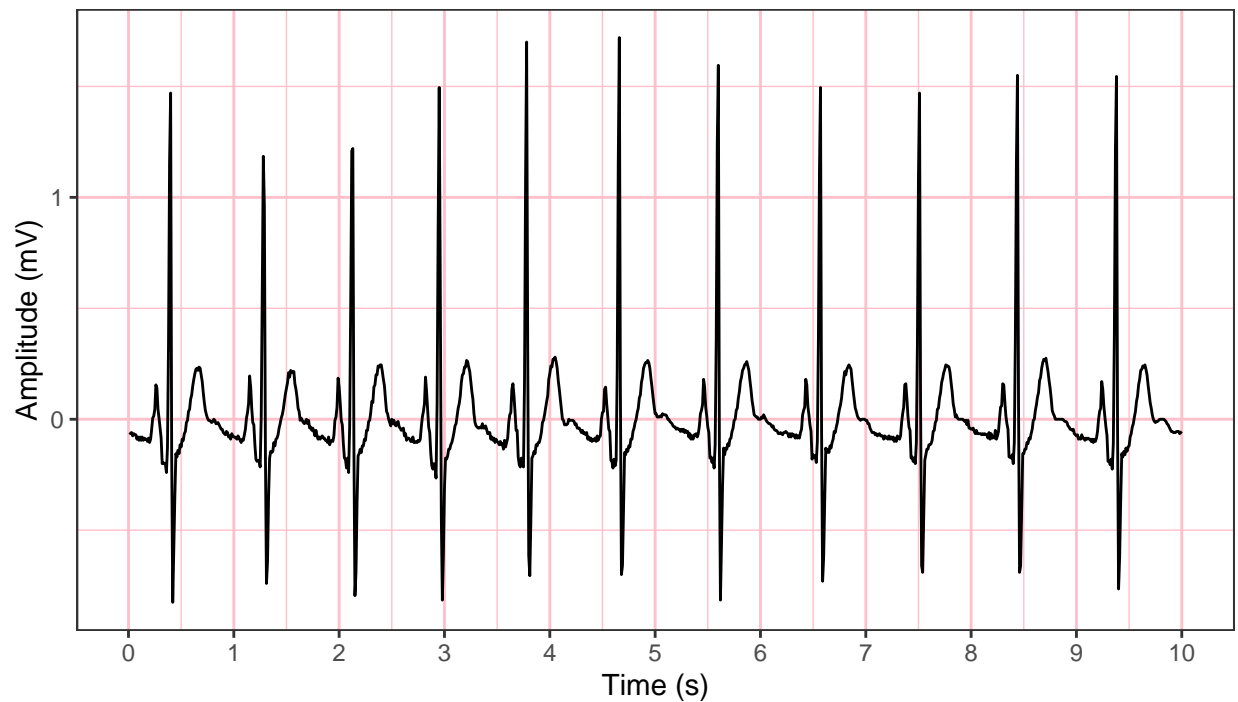
2 The data

2.1 Data source

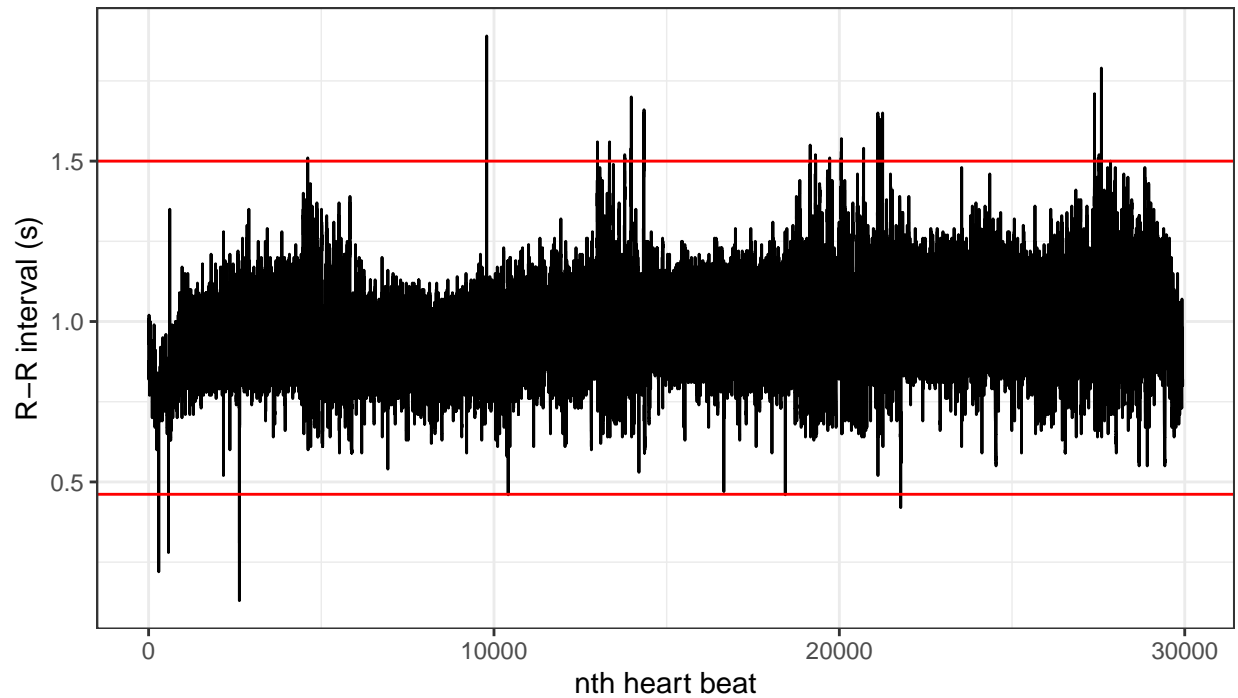
(Goldberger et al., 2000).

2.2 Sample plot

10-second sample of subject a01



8-hour R-R intervals of subject a01



```
interval <- rr_interval(data$voltage)
range(interval) ## Range of R-R intervals

#> [1] 0.13 1.89

60 / range(interval) ## Range of instantaneous heart rate per minute

#> [1] 461.53846 31.74603

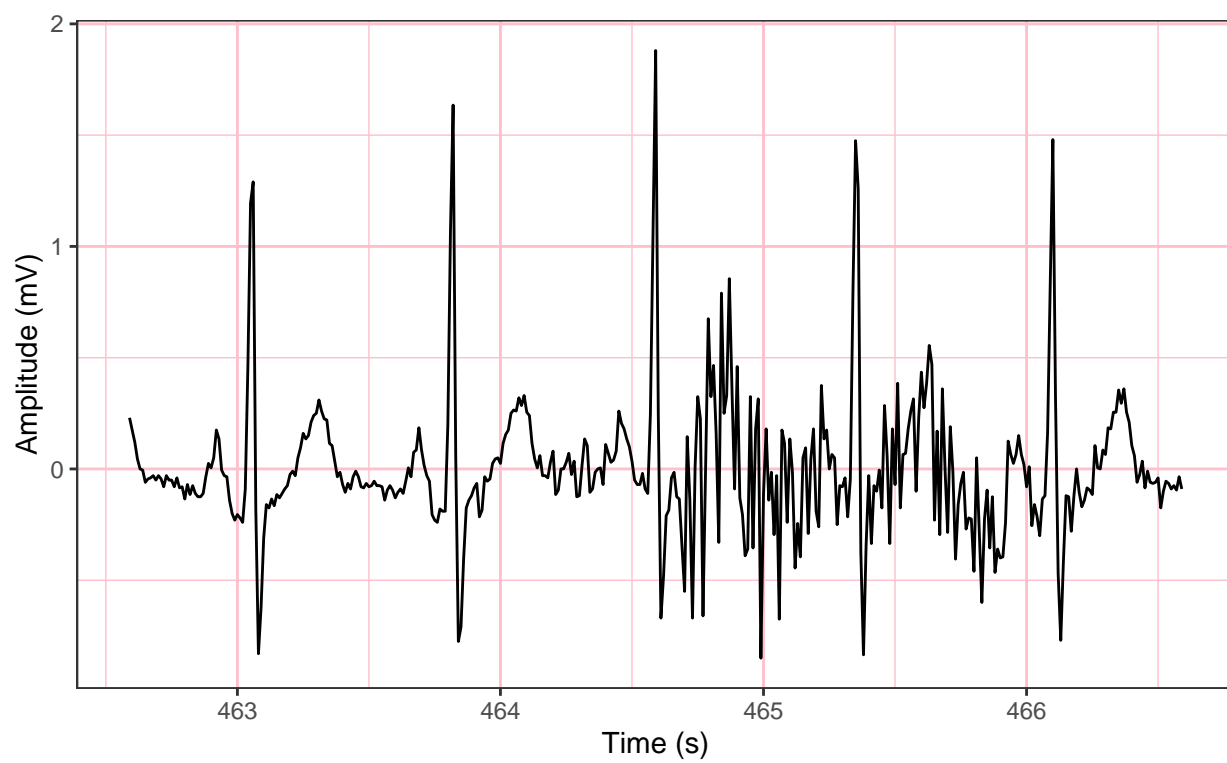
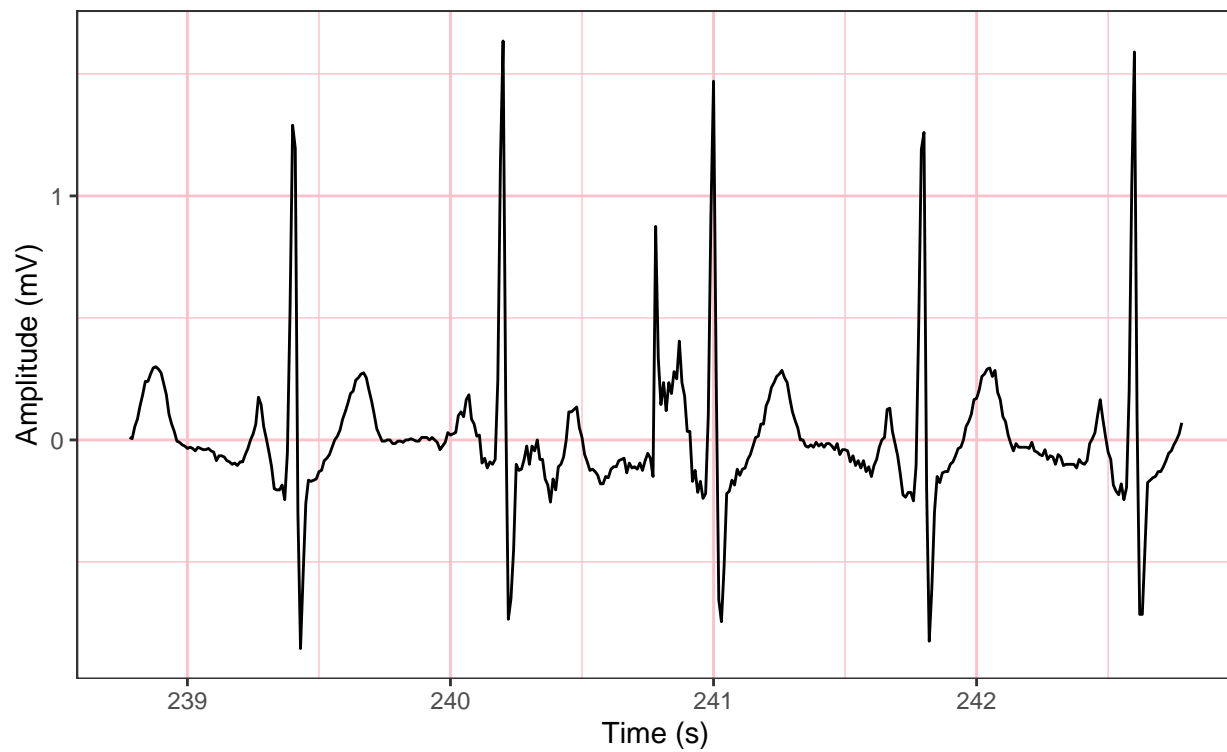
abnormal_interval <- abnormal_rr(data$voltage, max_bpm = 130, min_bpm = 40)
length(abnormal_interval) ## Number of abnormal R-R intervals

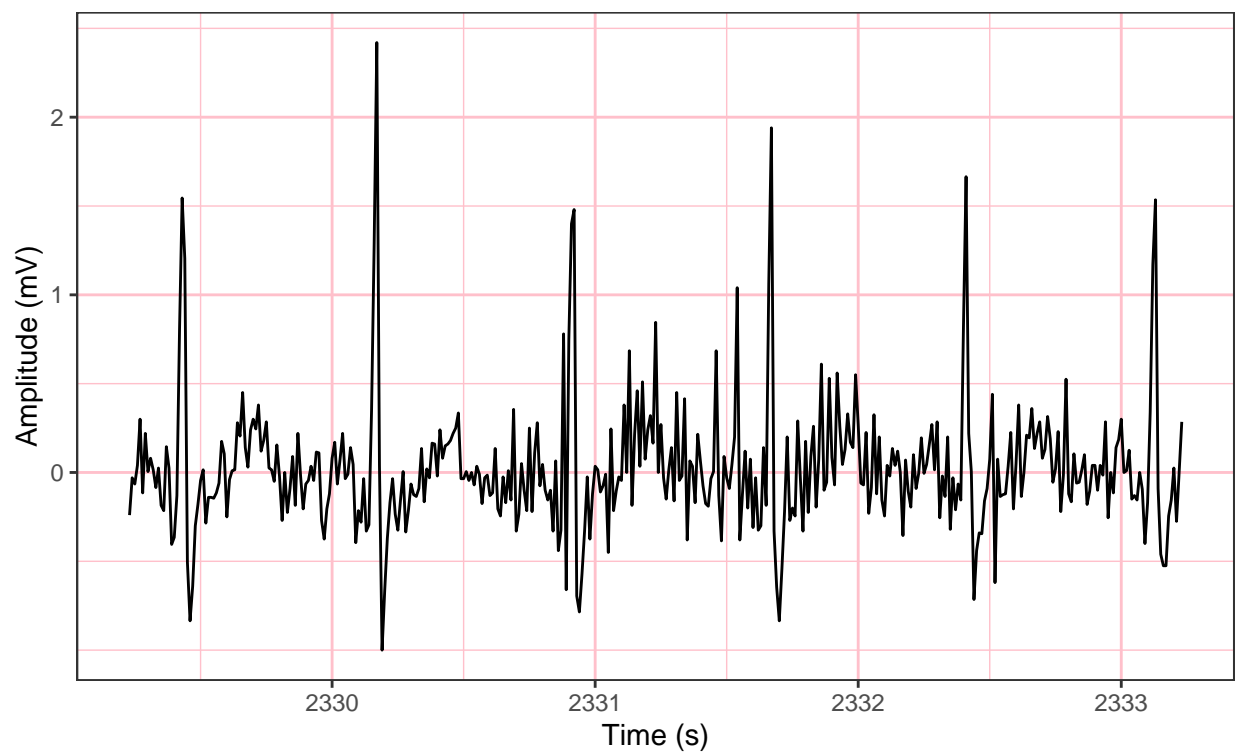
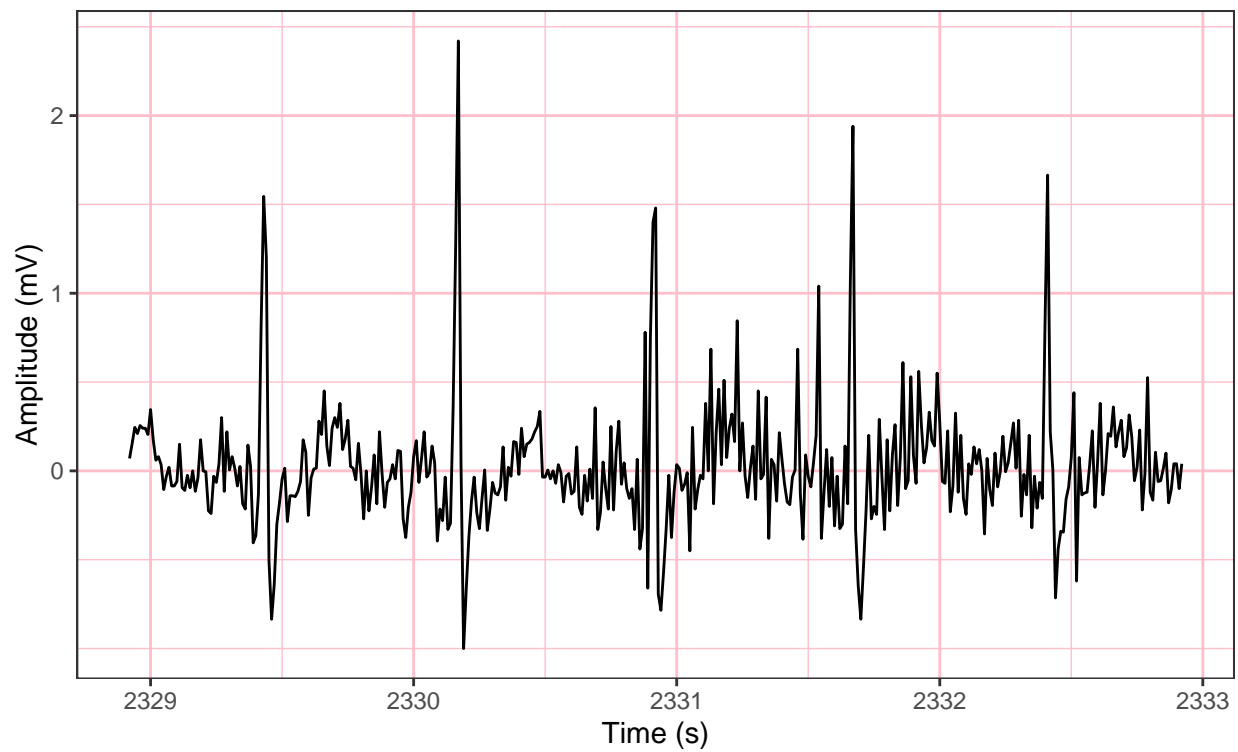
#> [1] 58

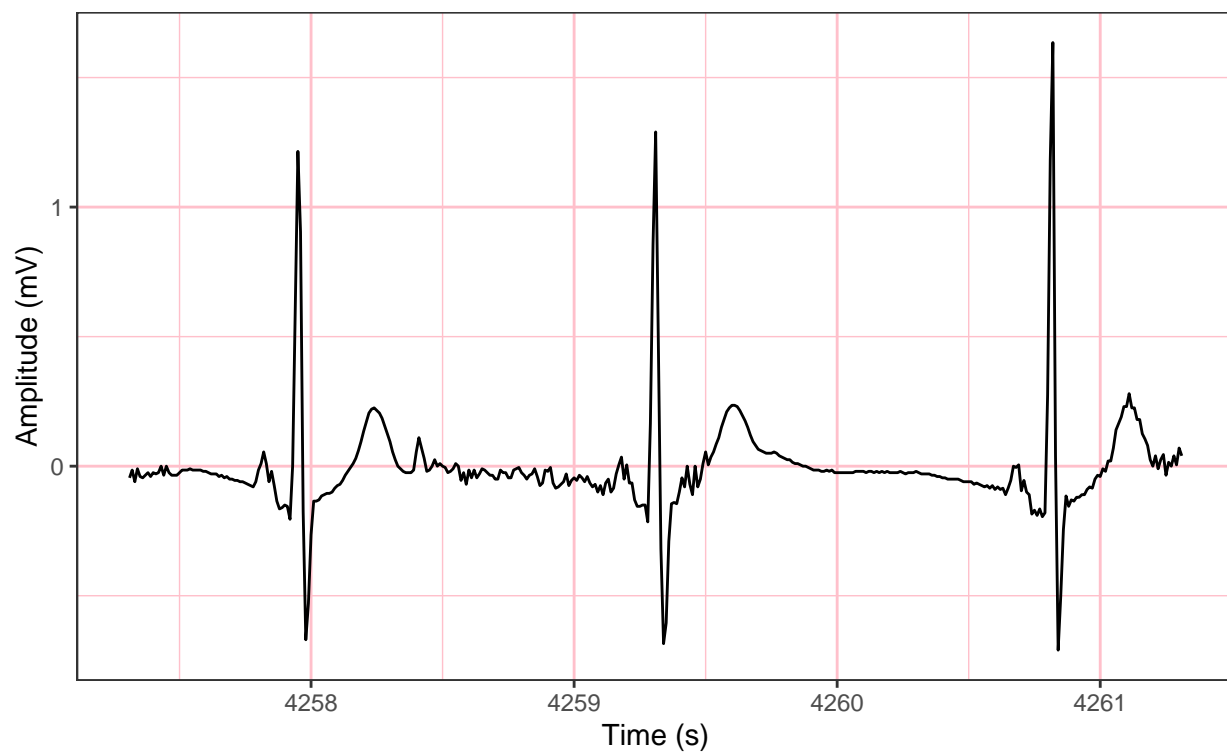
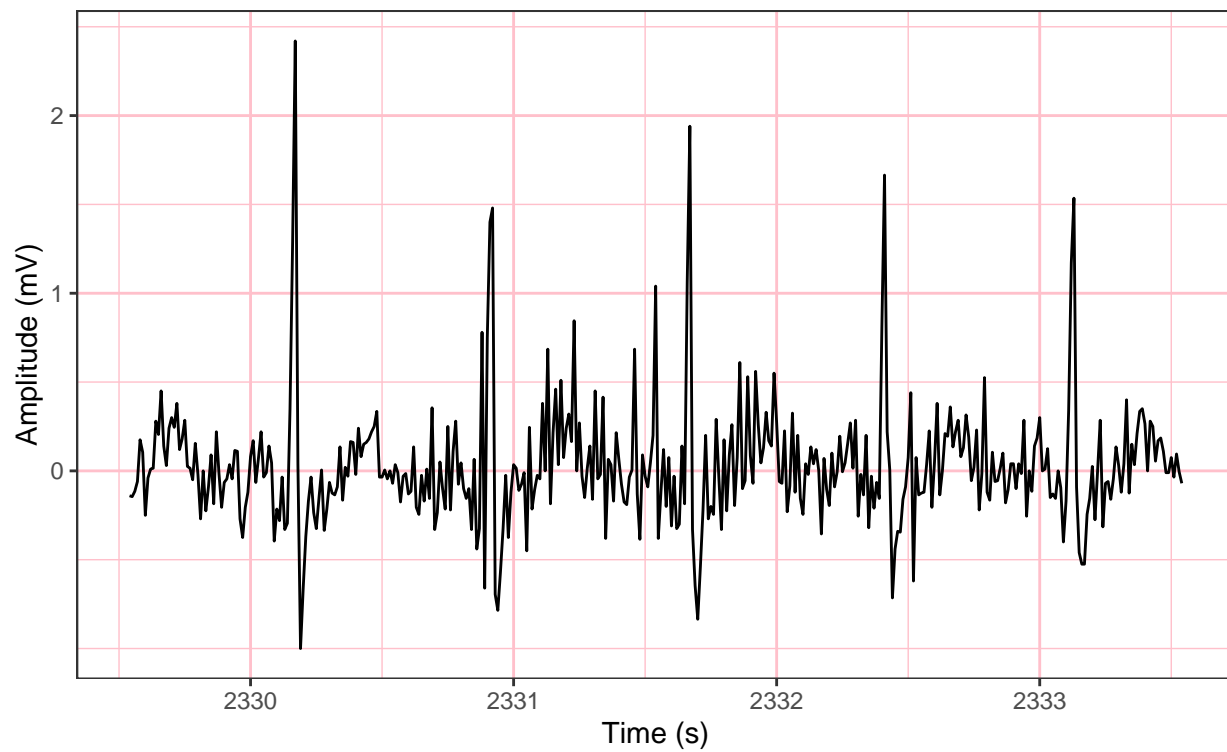
length(interval) ## Total number of heart beats

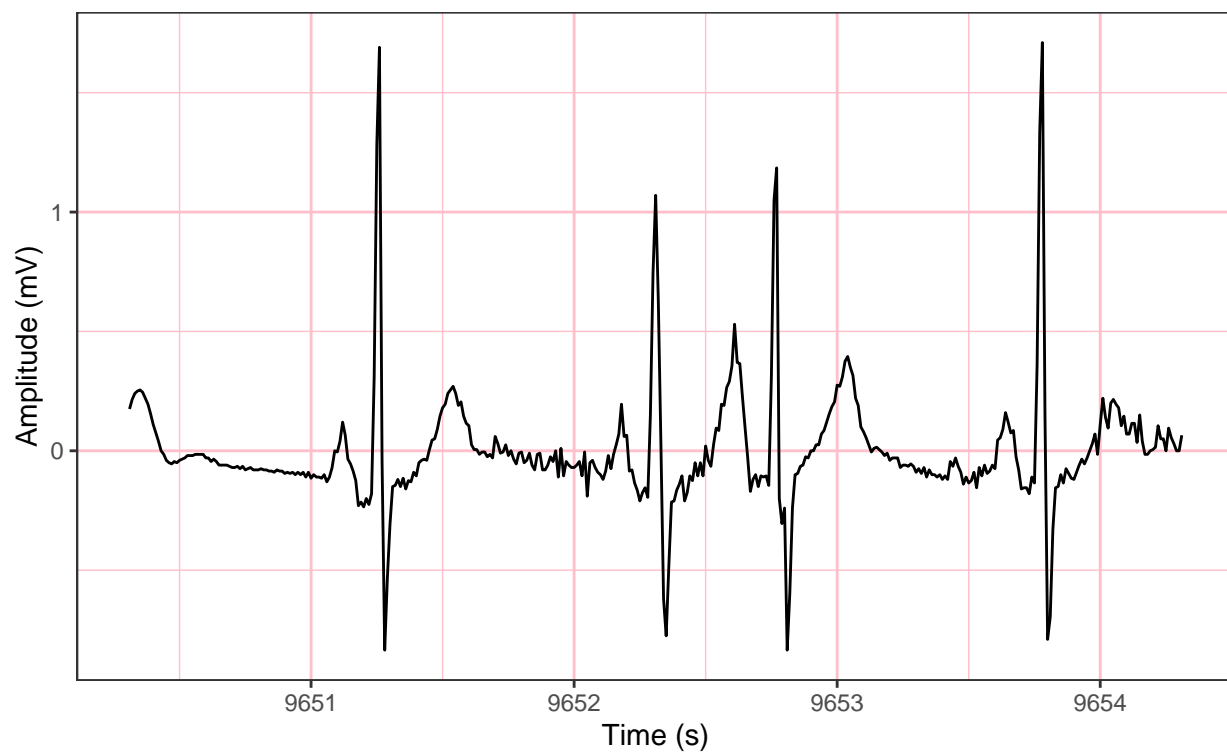
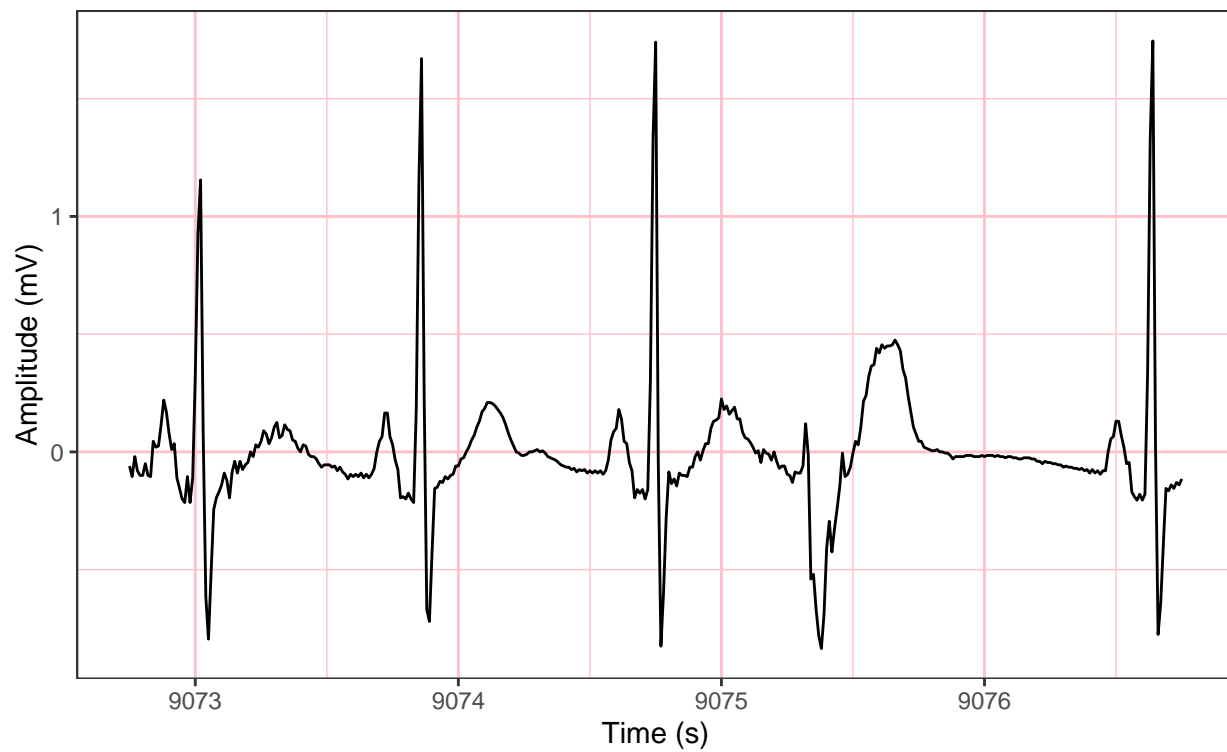
#> [1] 29941

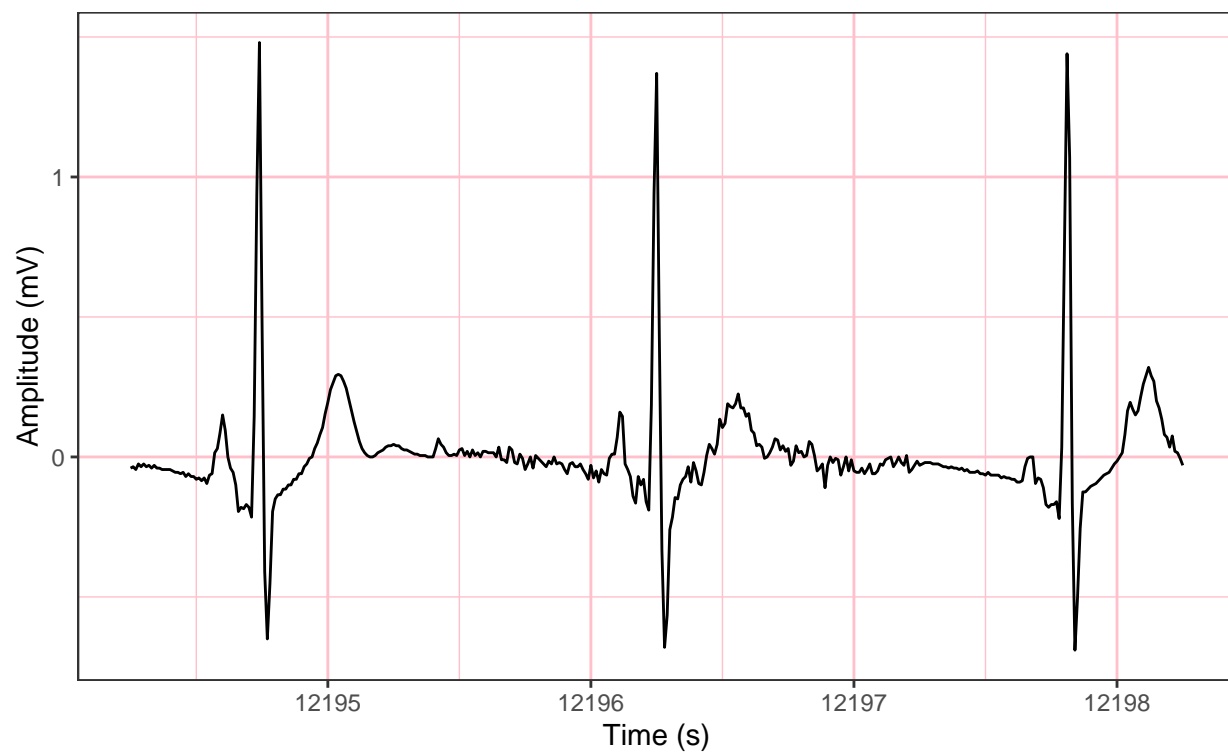
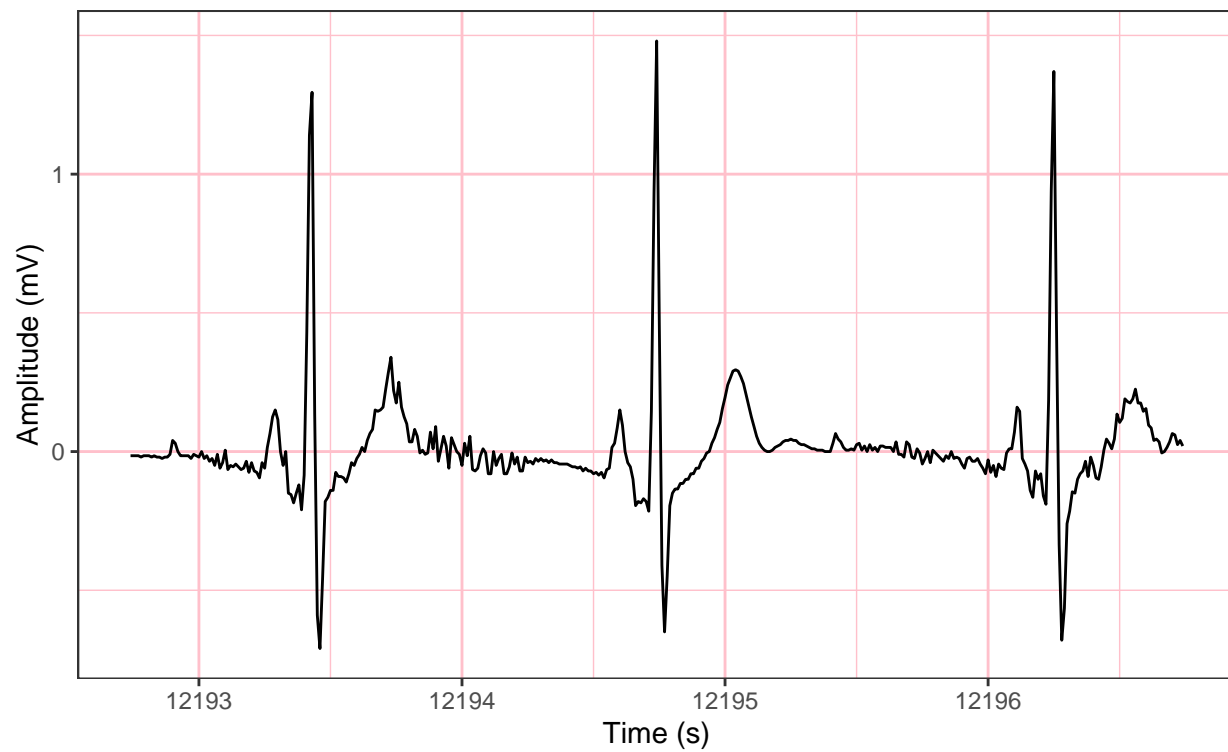
invisible(map(seq_len(58), function(i) print(plot_abnormal_rr(data, i))))
```

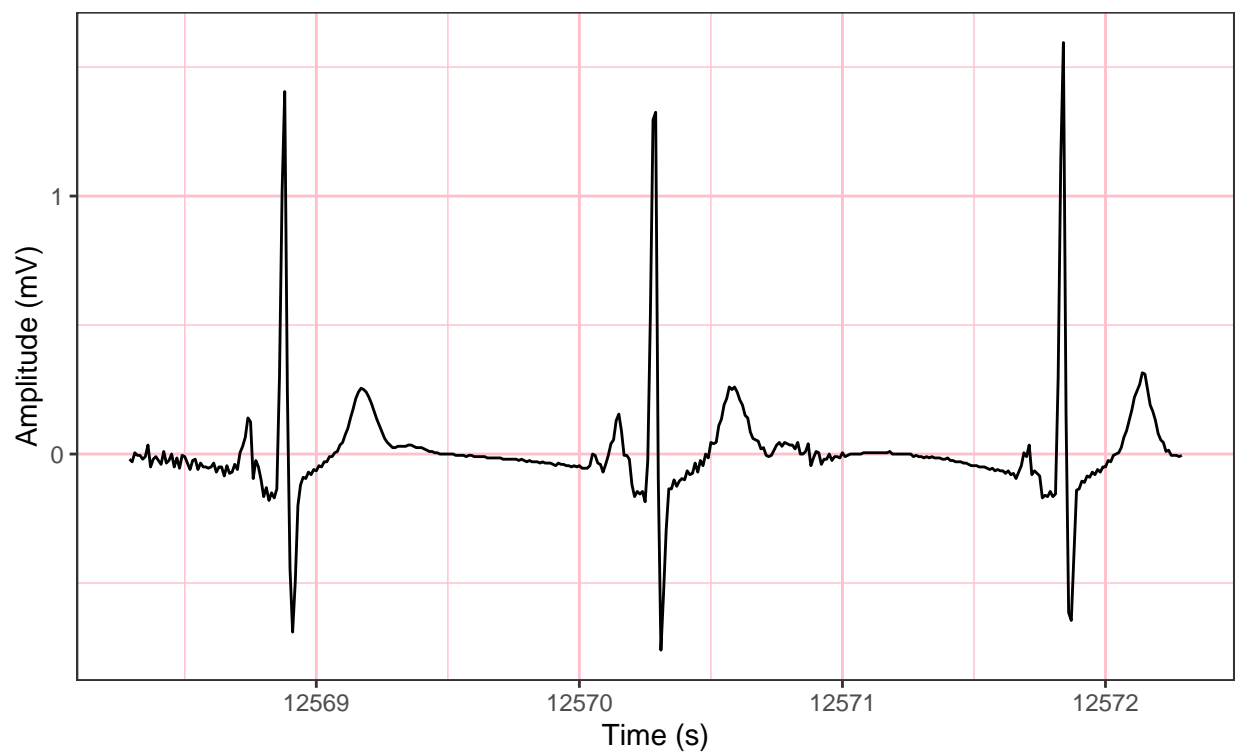
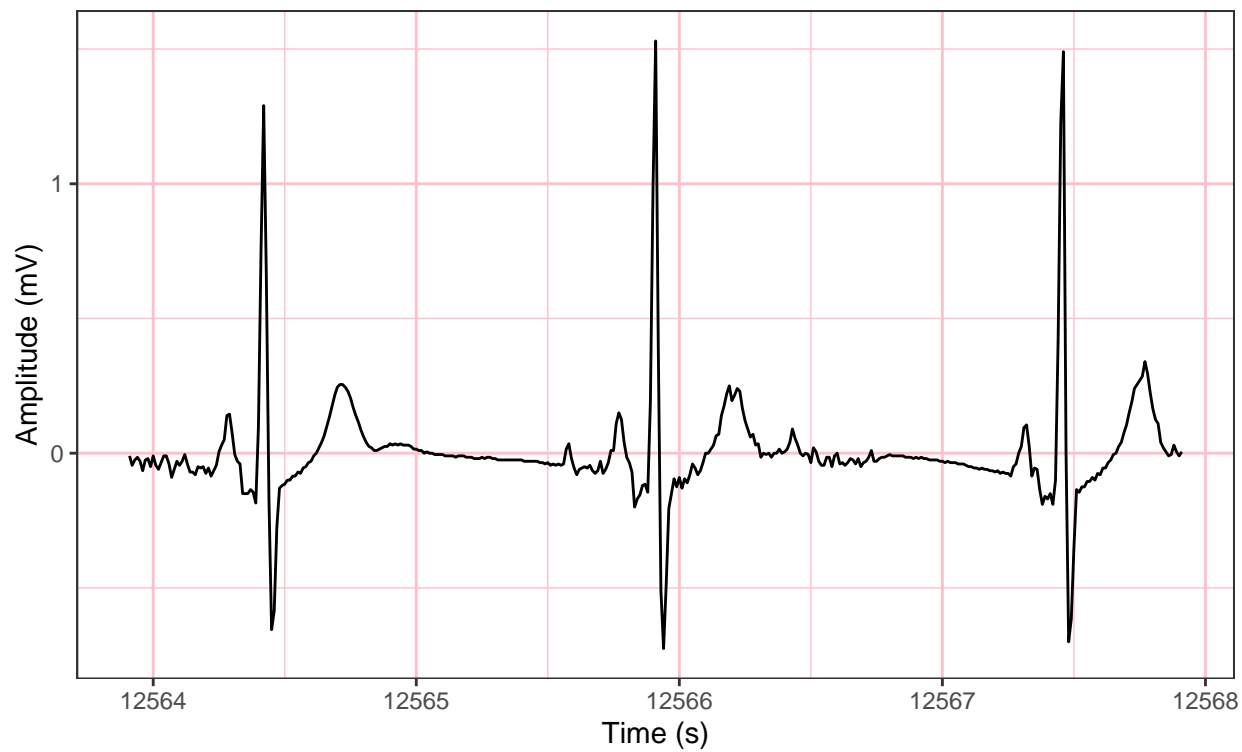


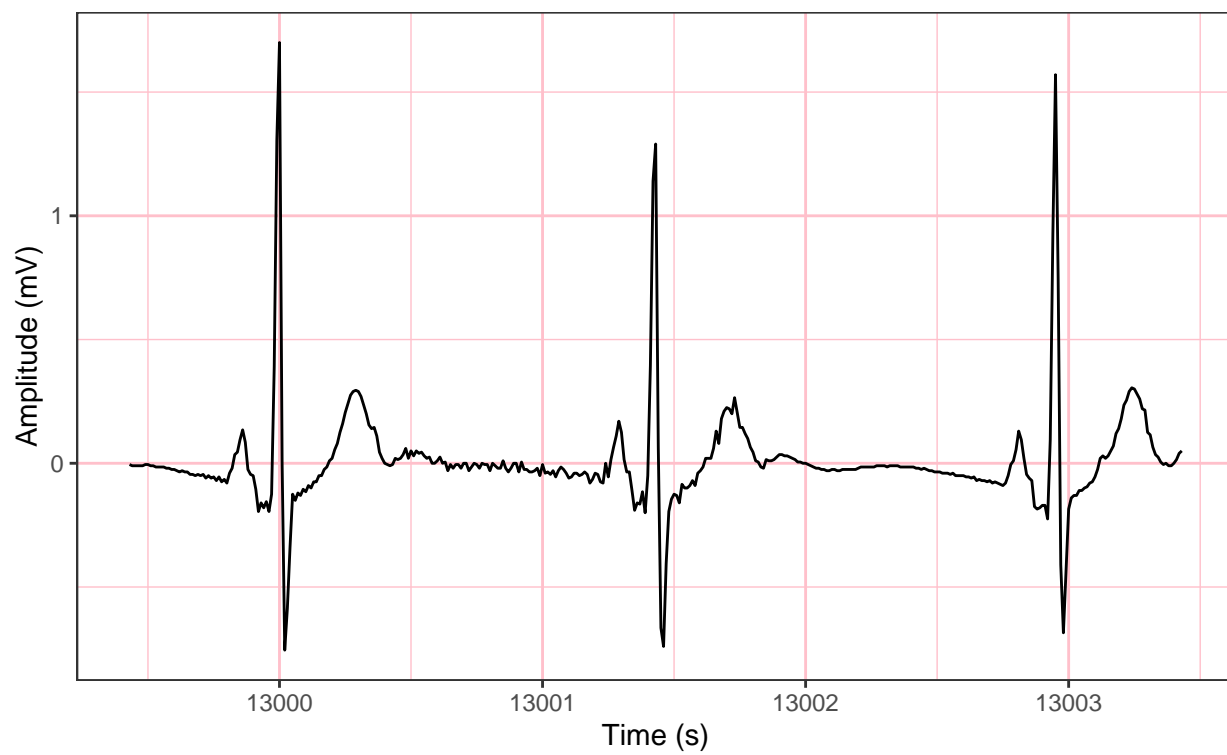
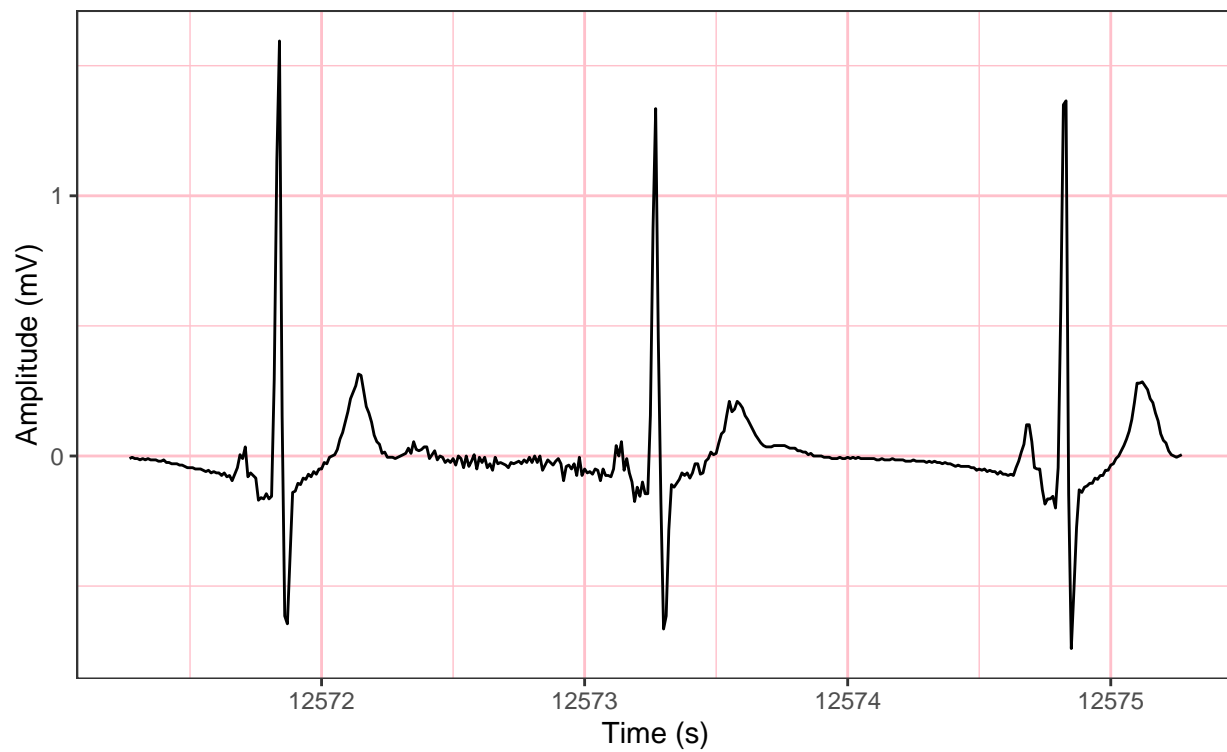


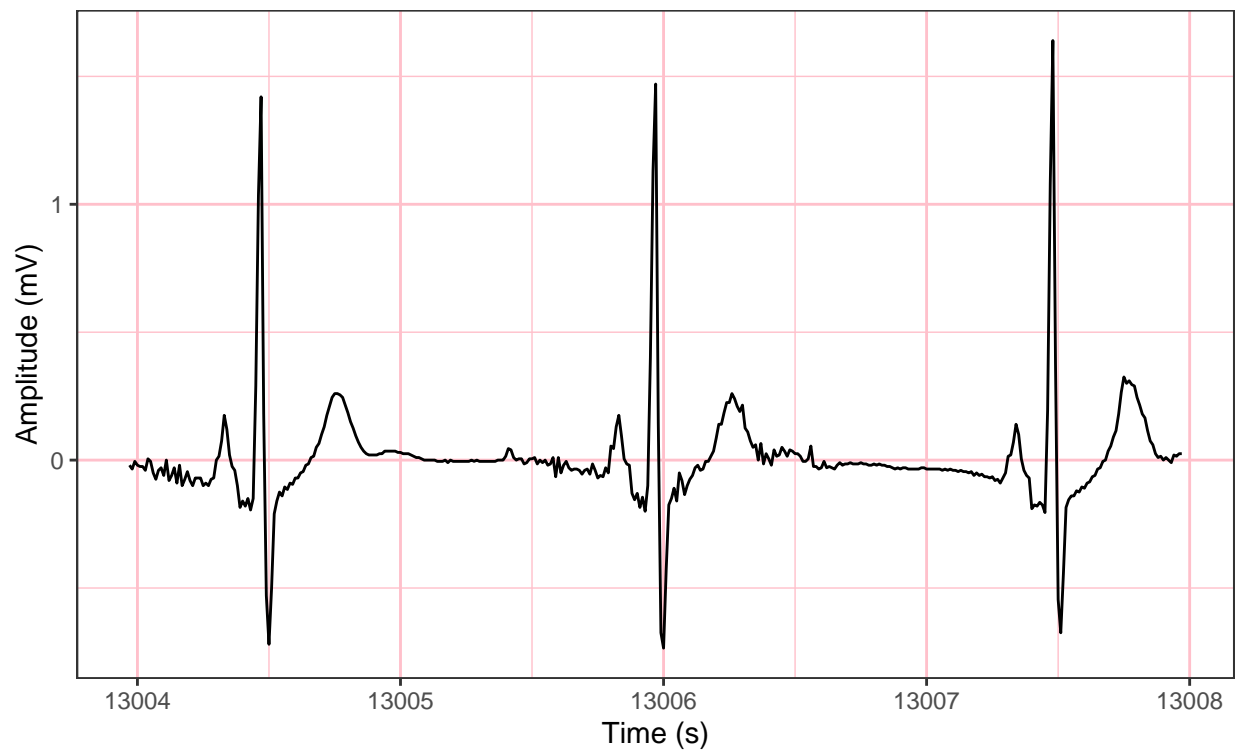
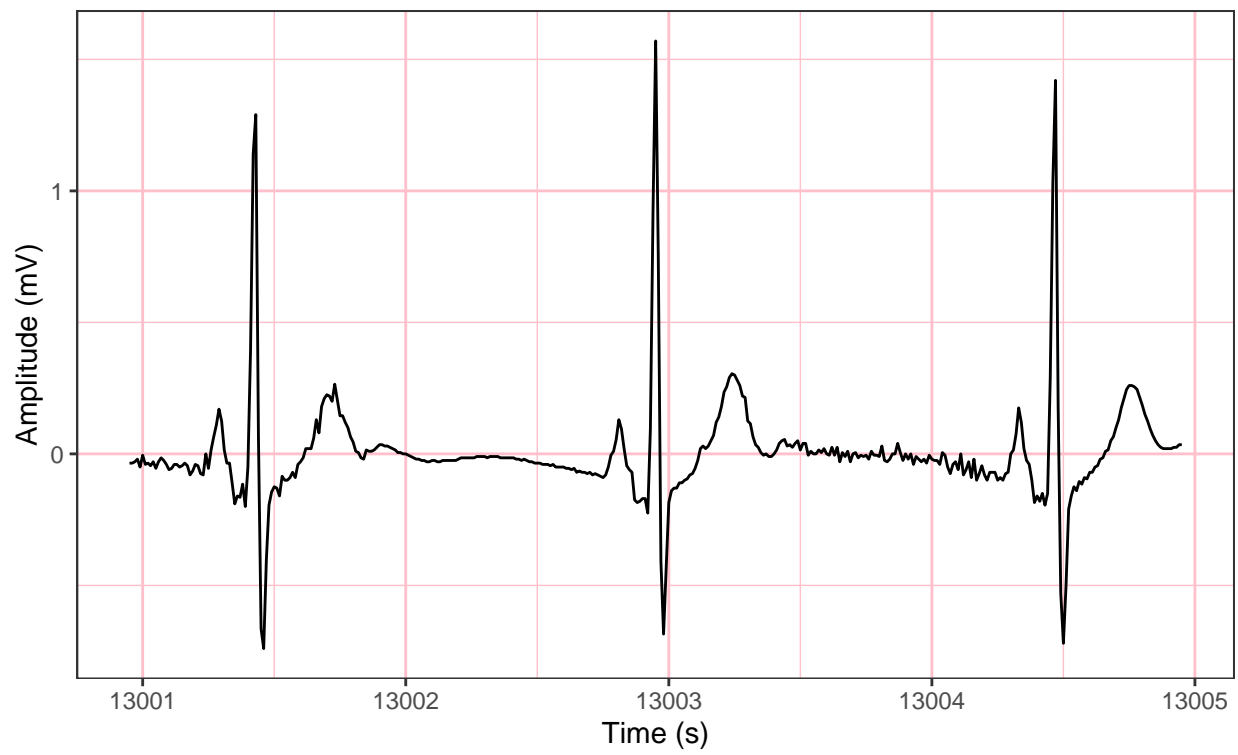


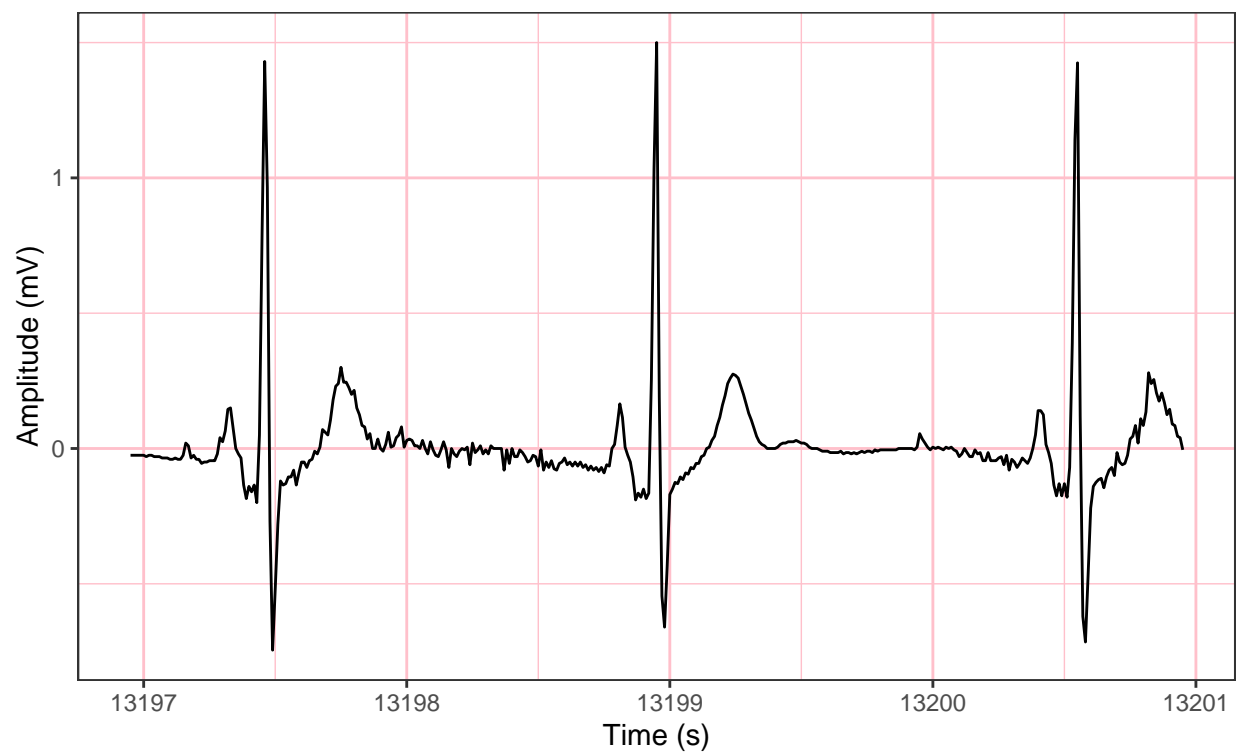
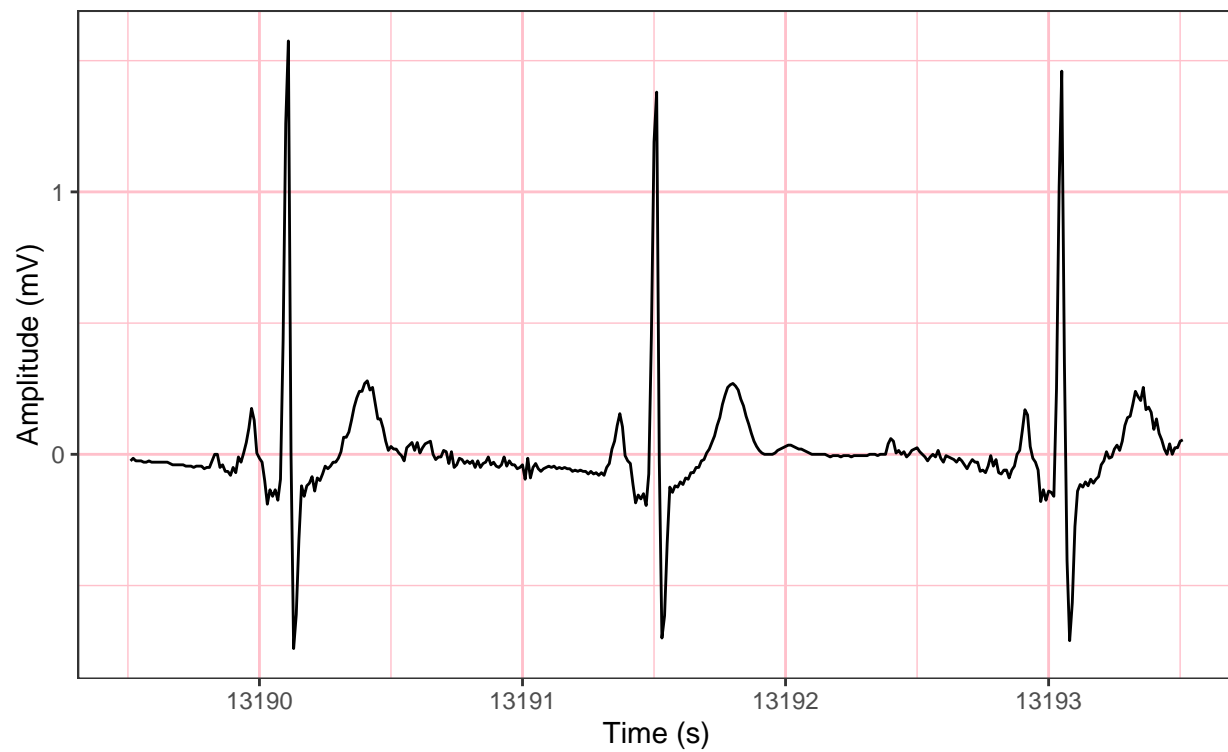


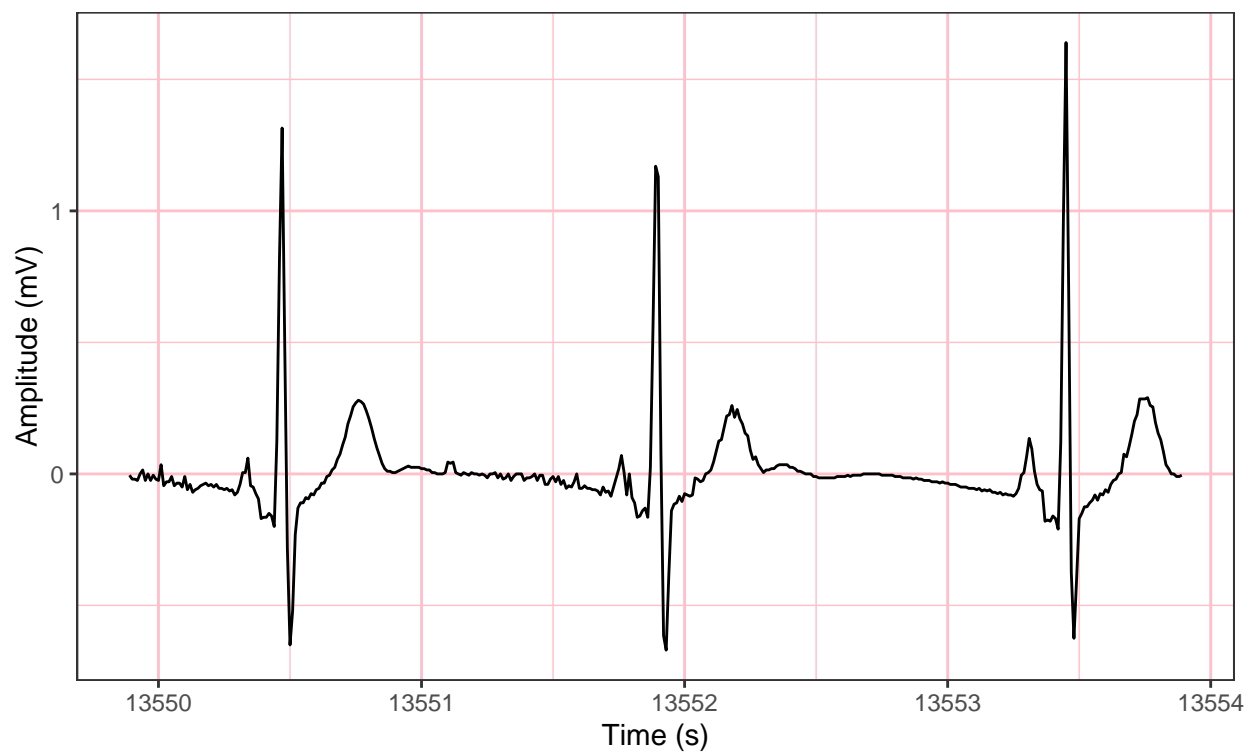
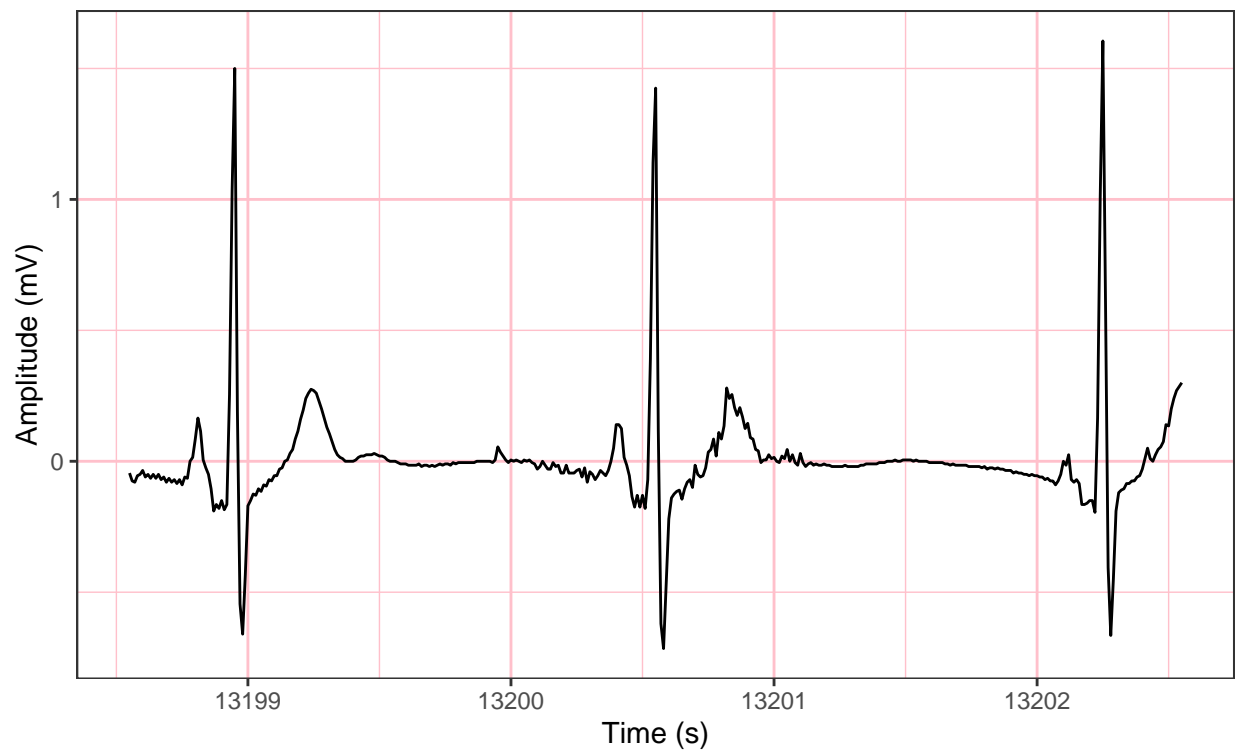


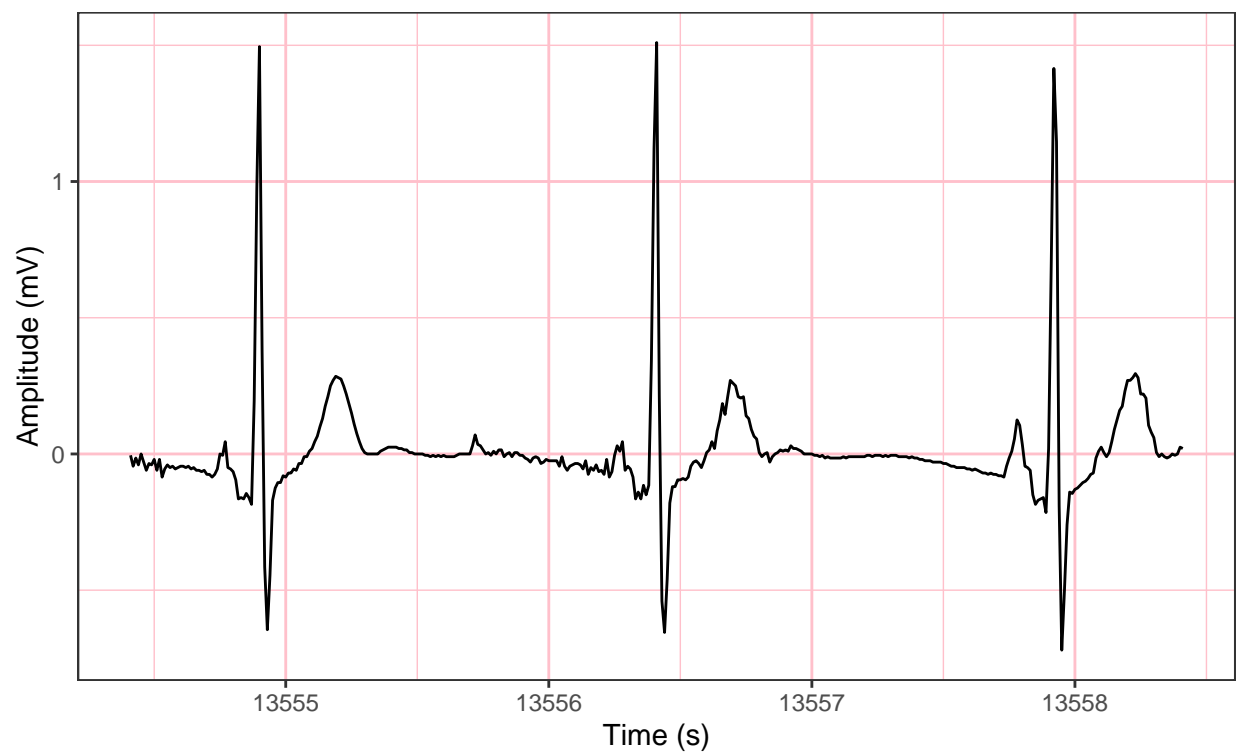
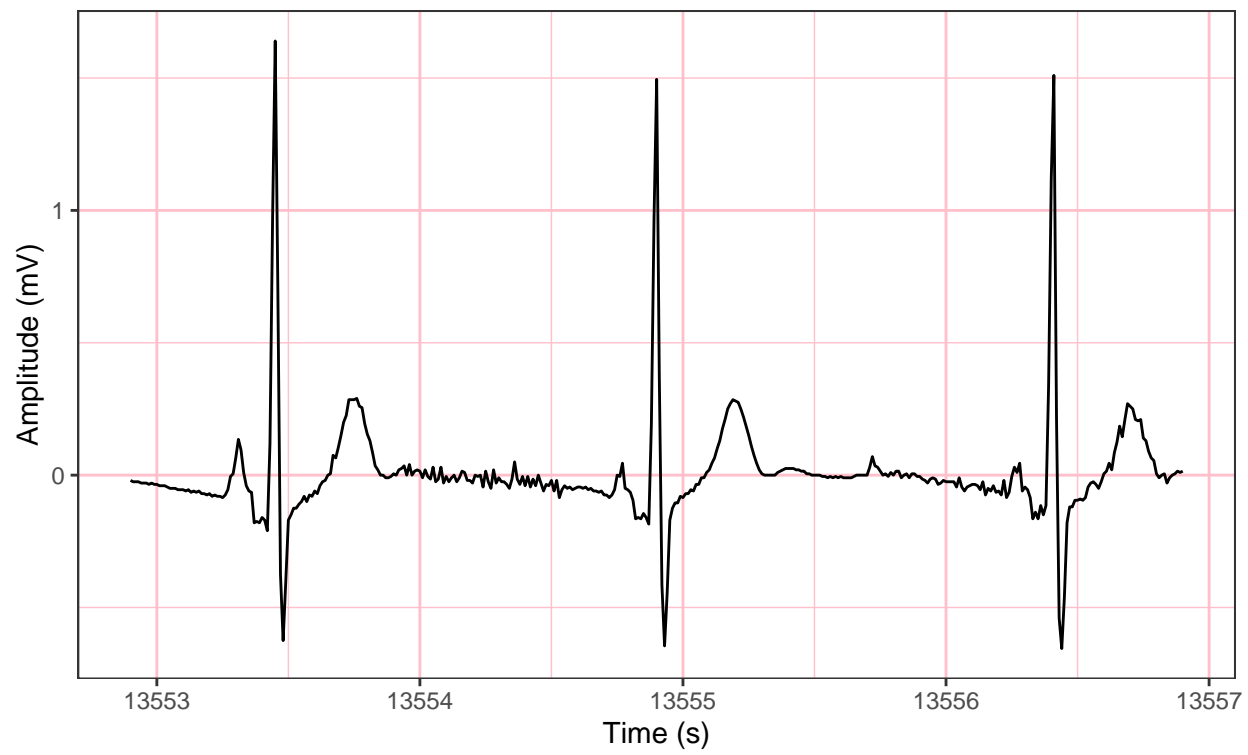


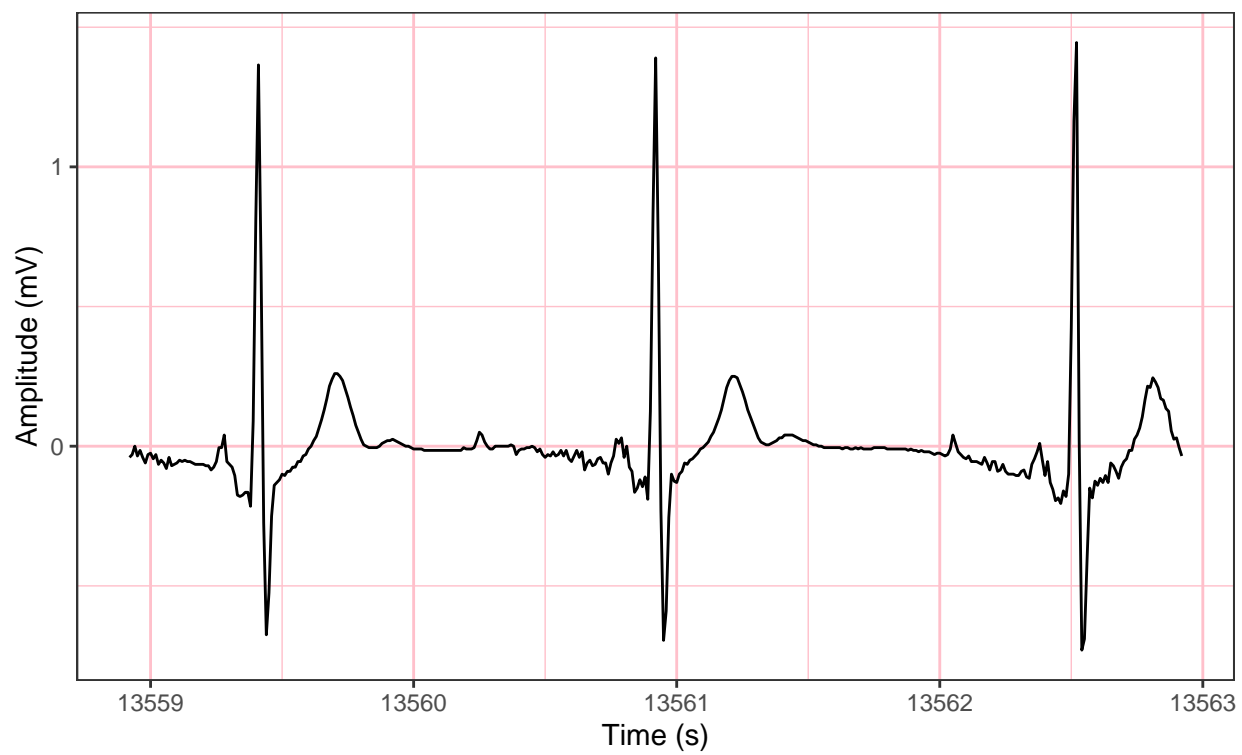
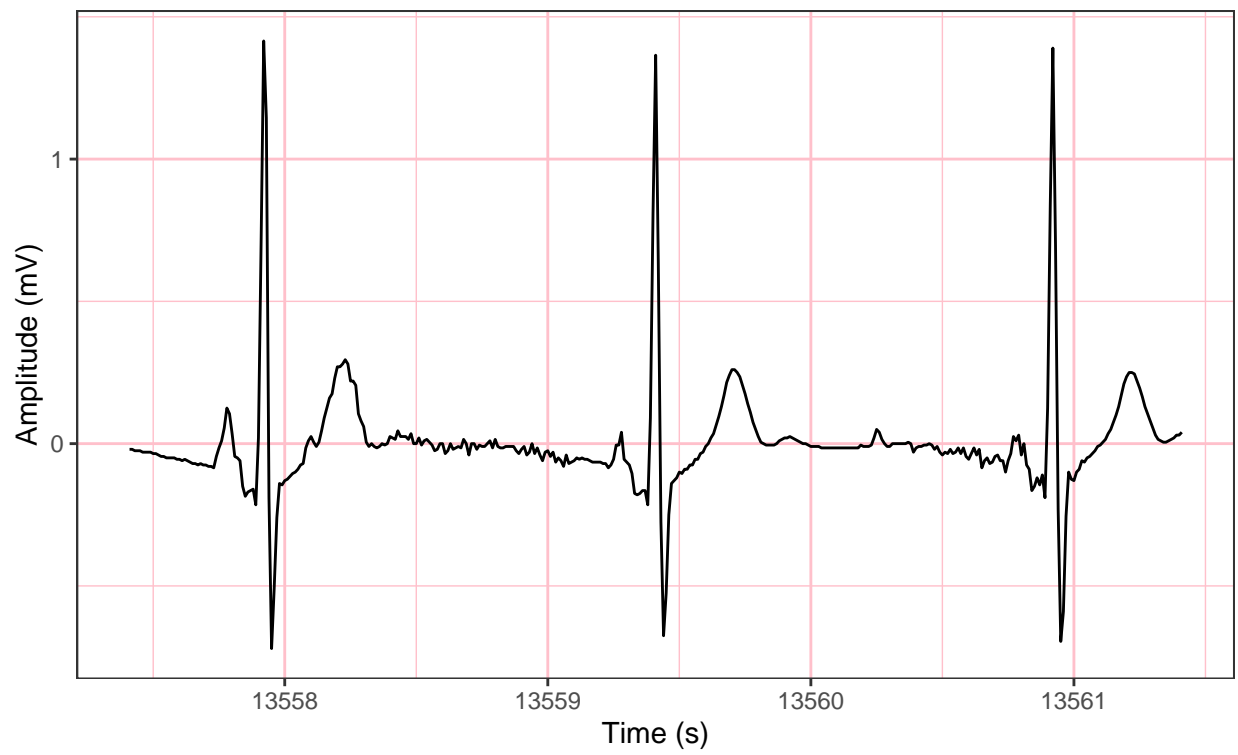


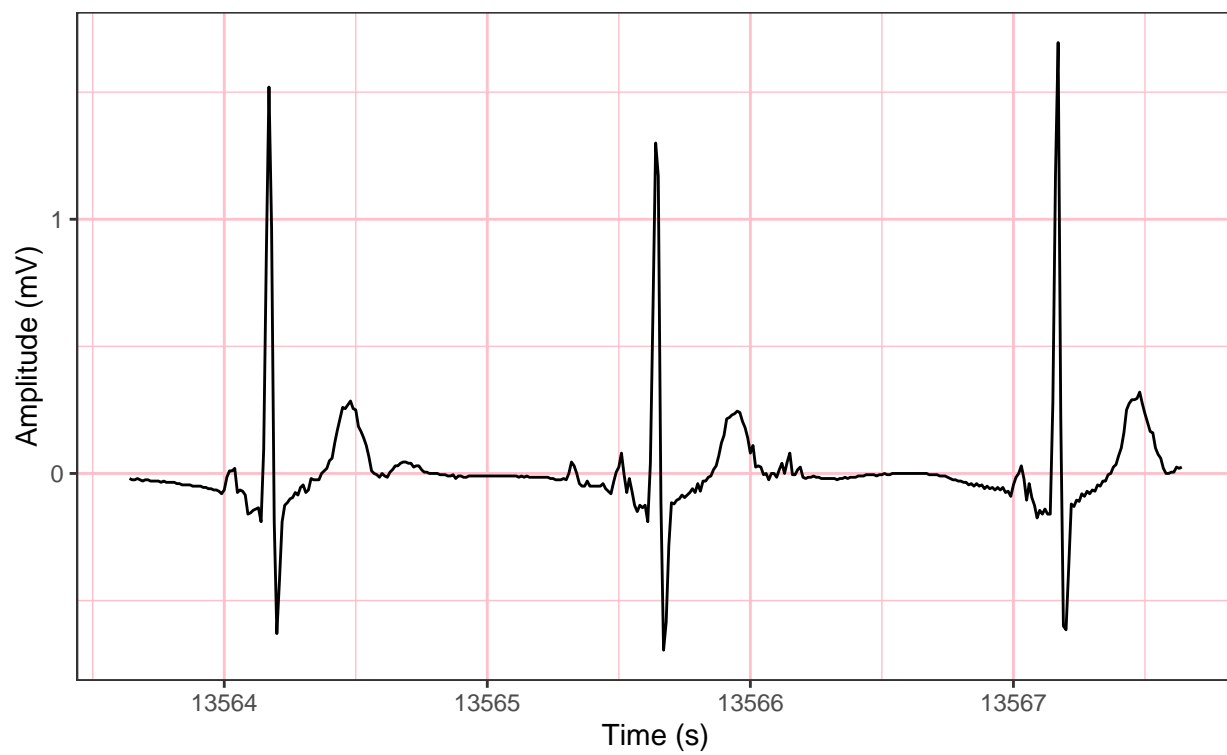
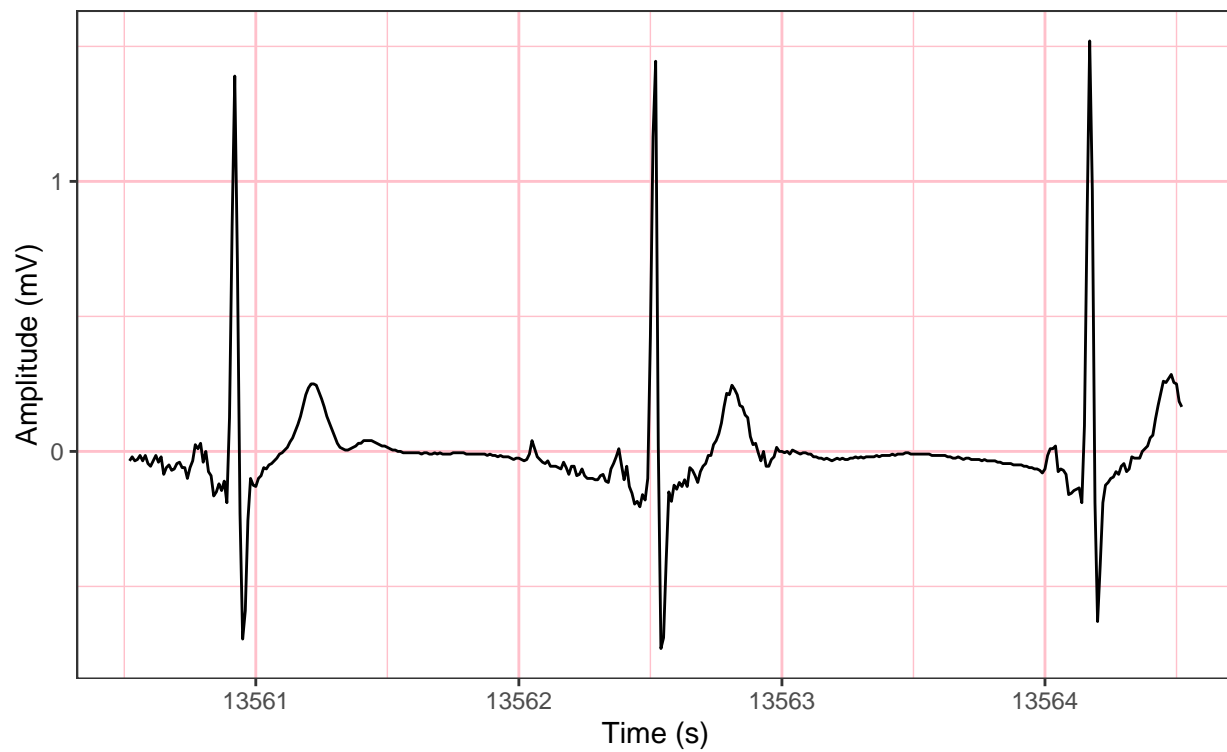


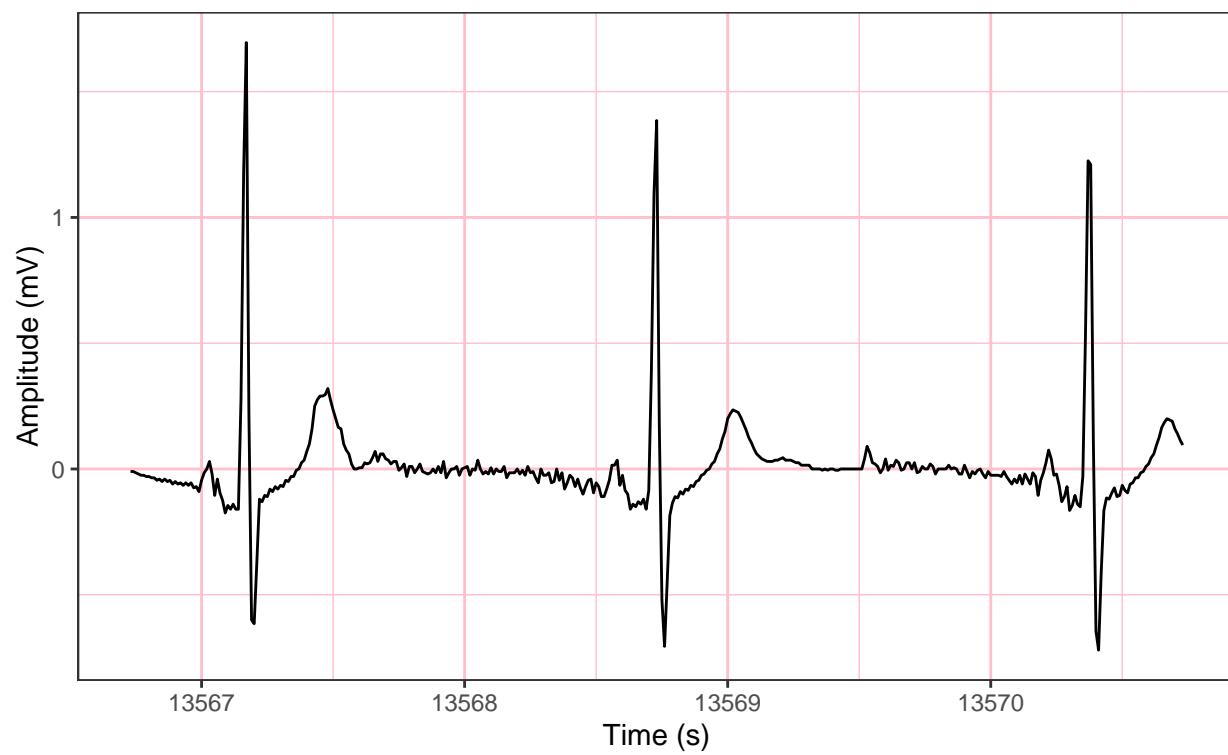
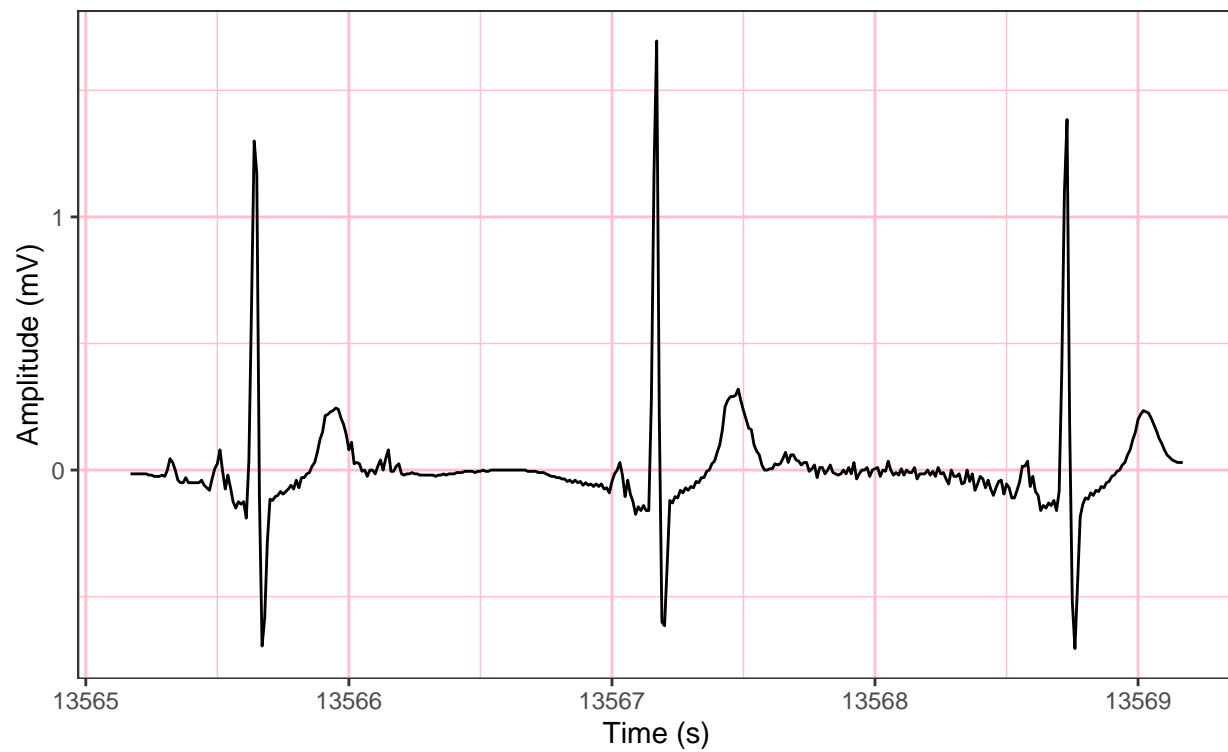


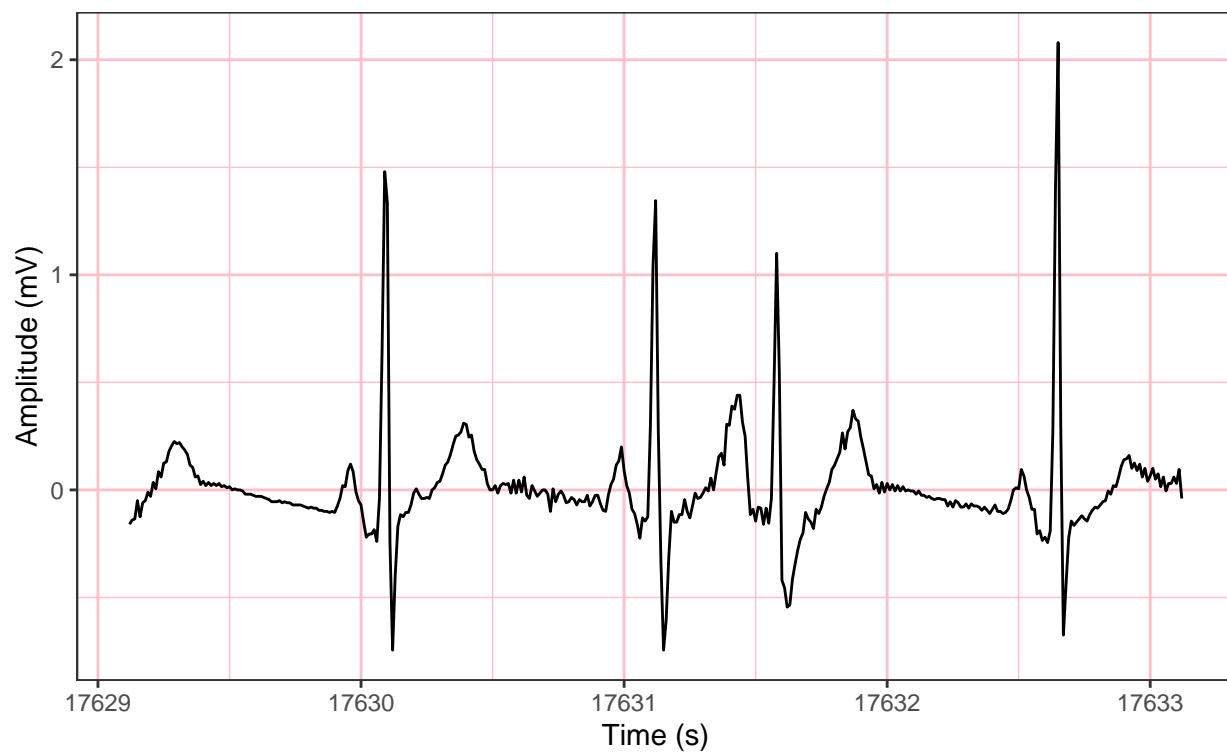
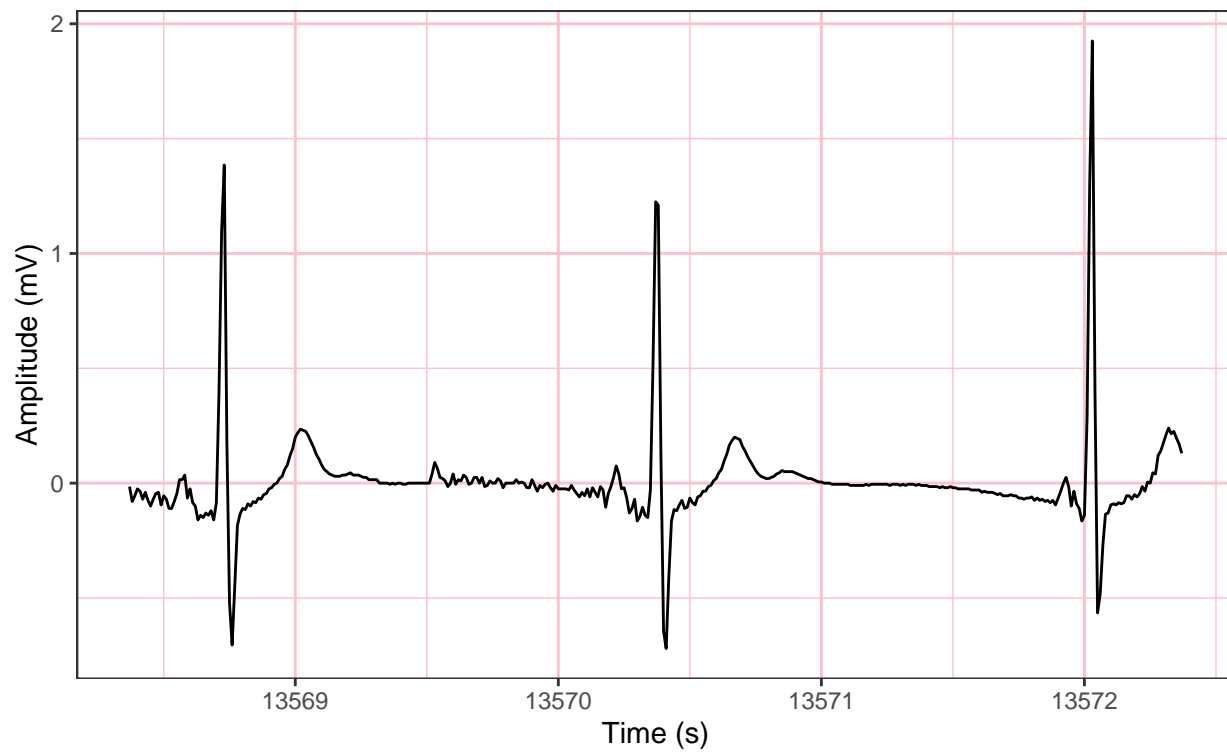


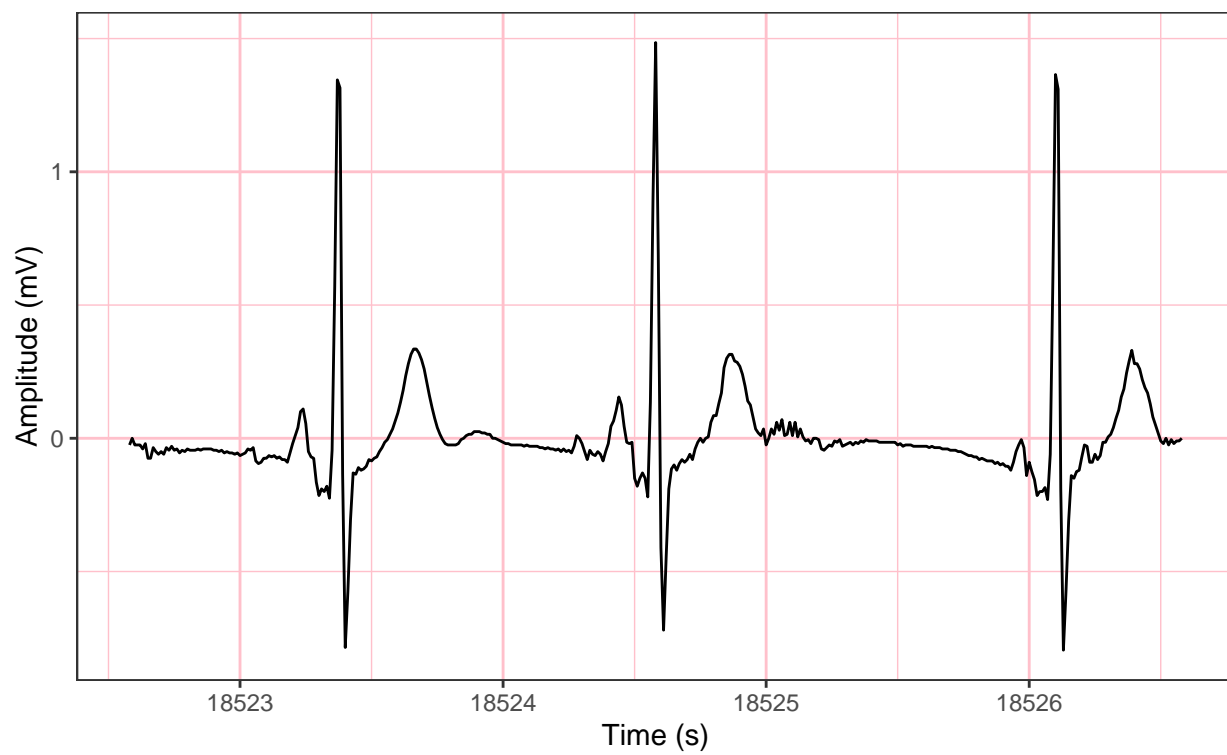
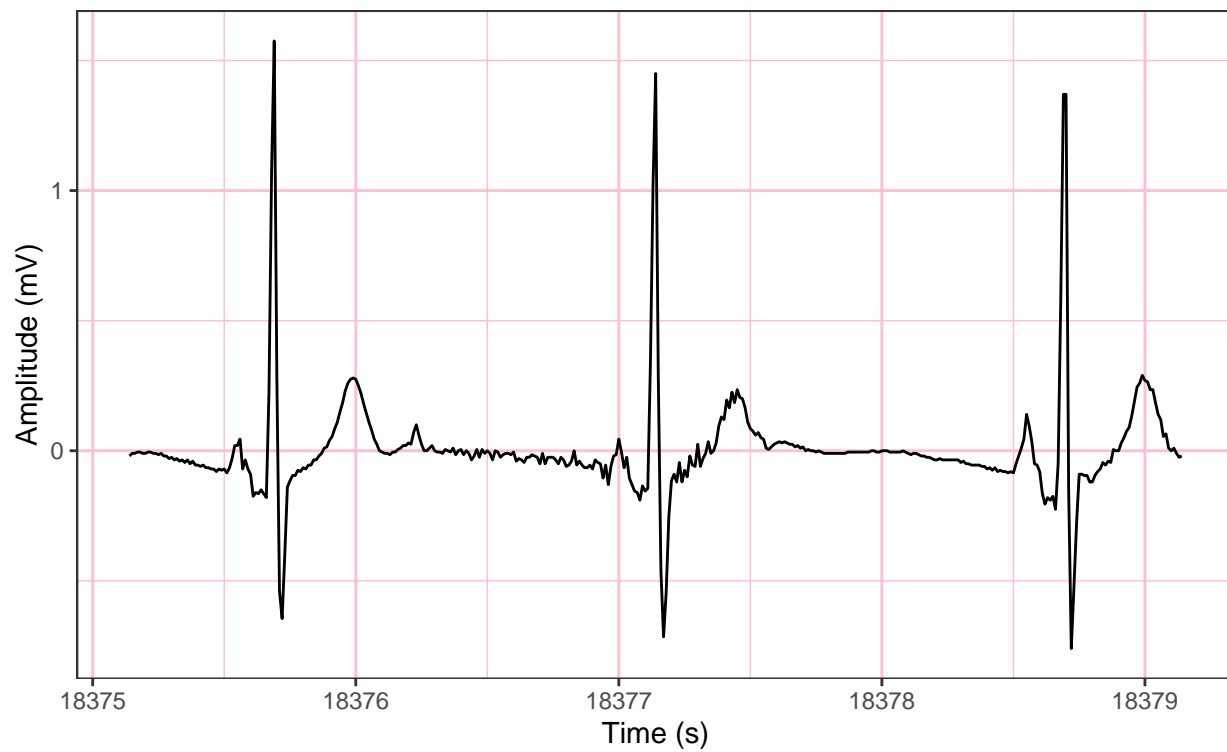


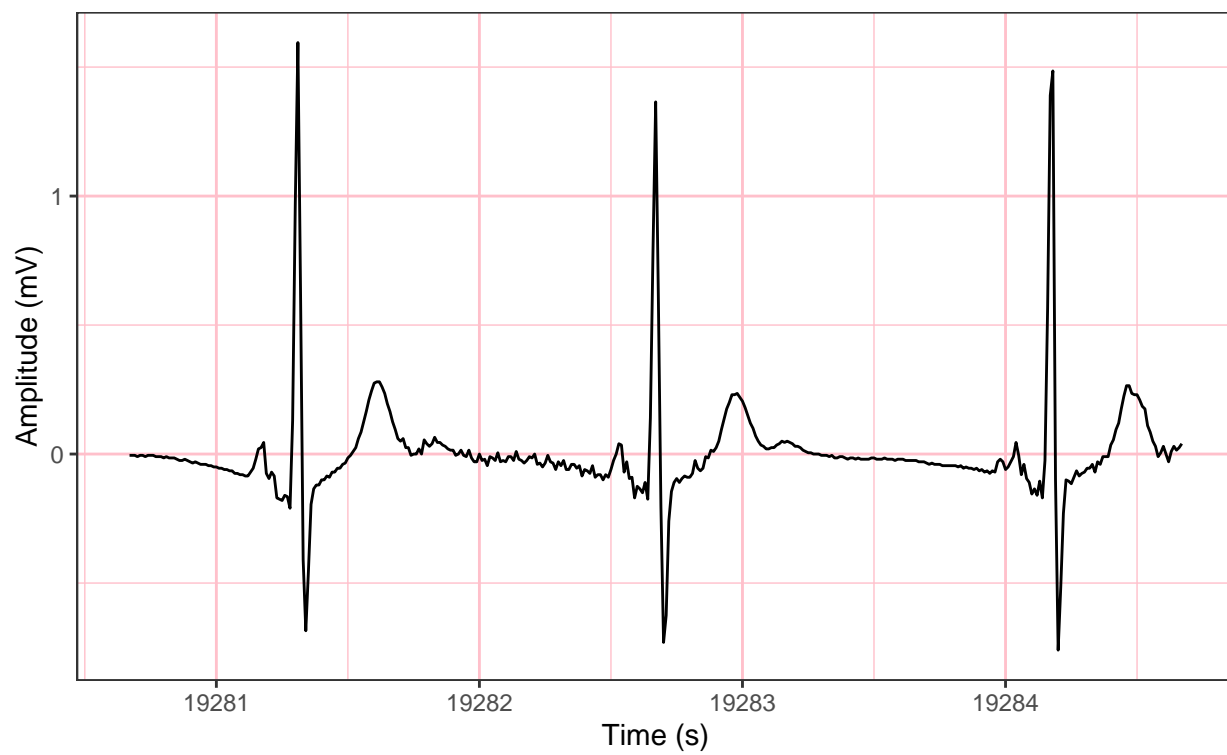
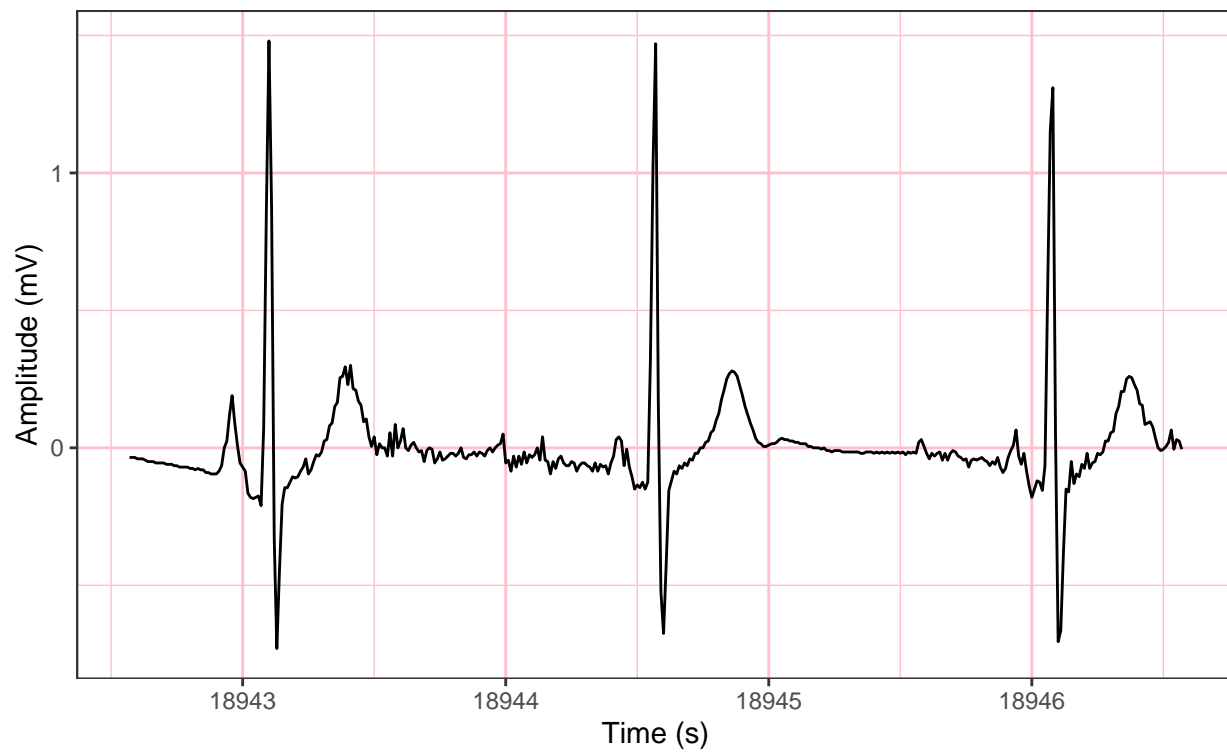


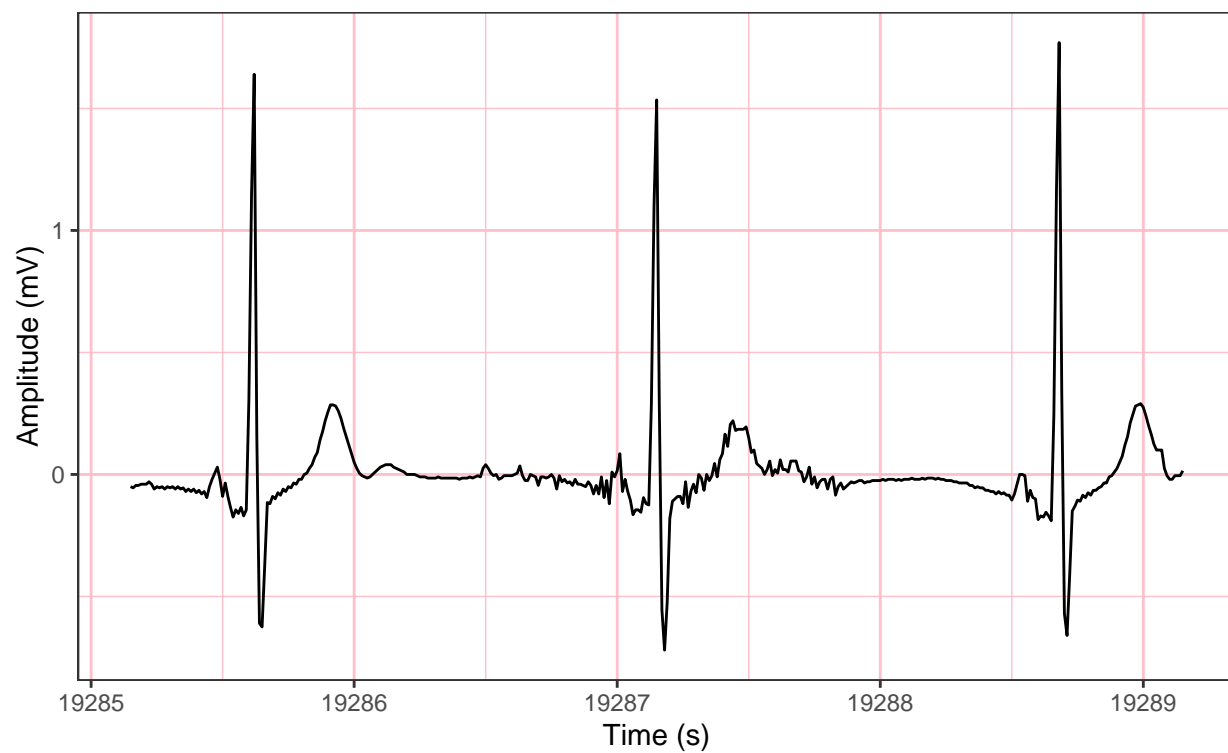
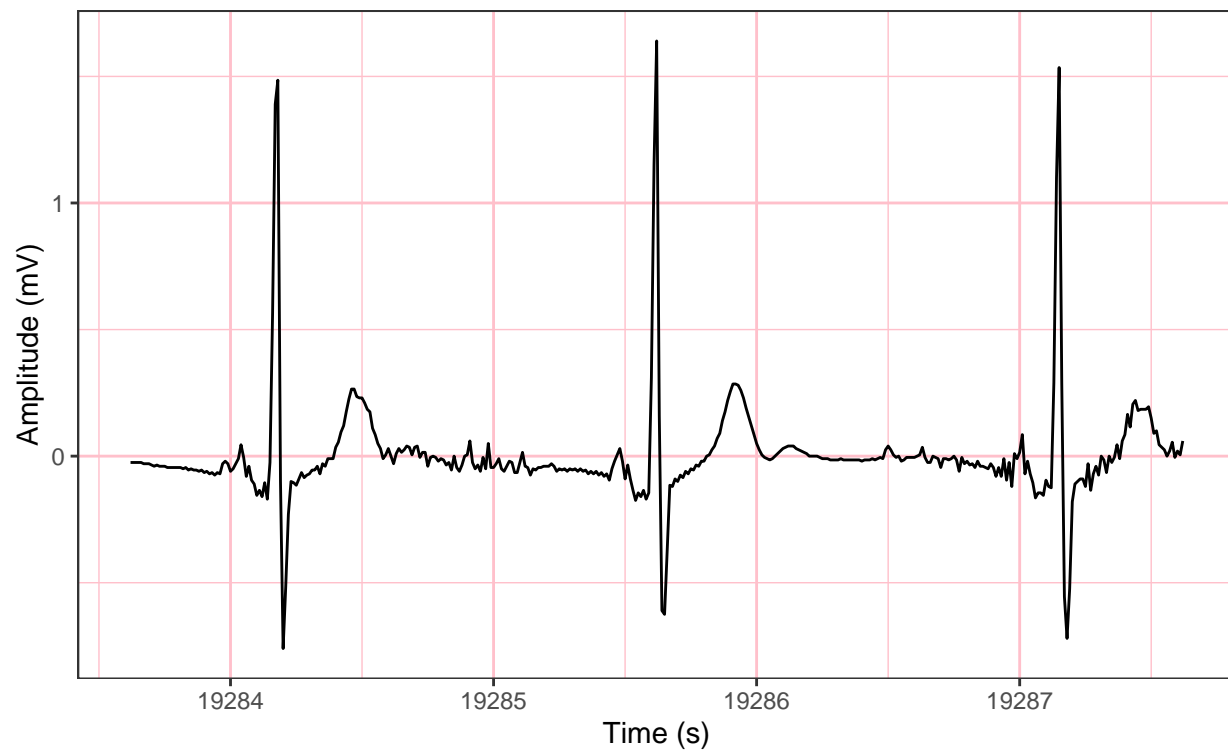


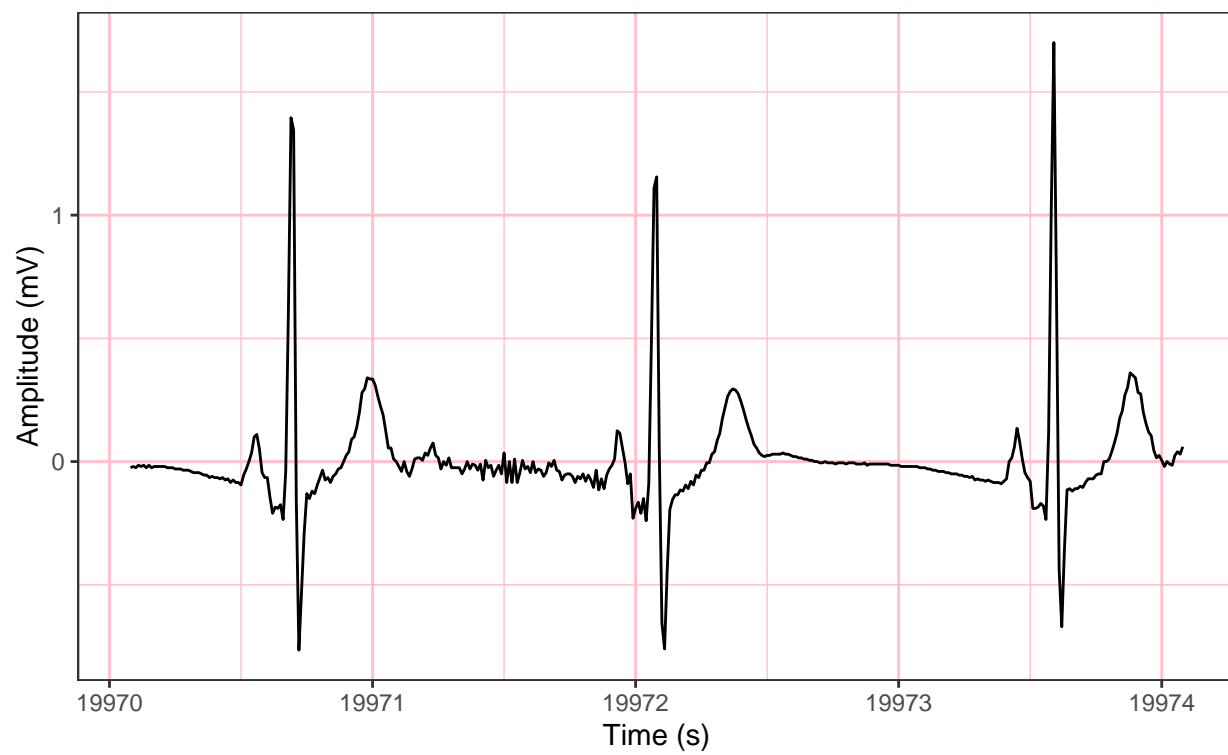
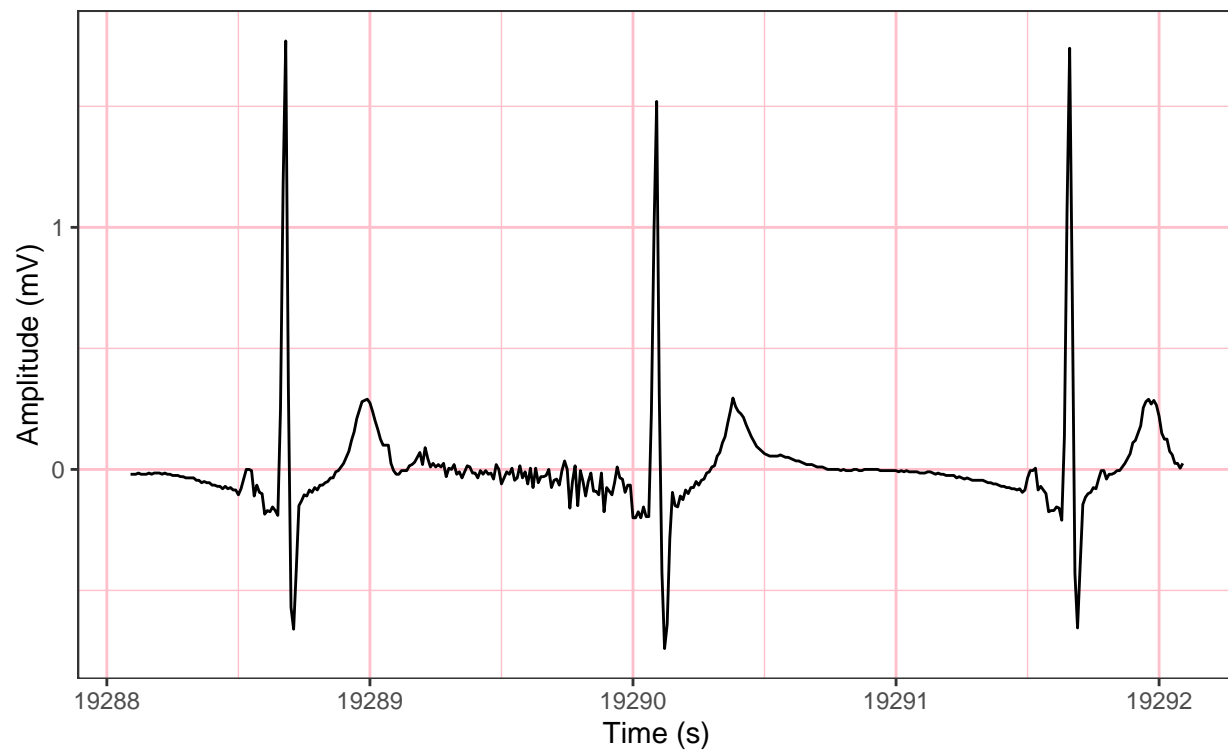


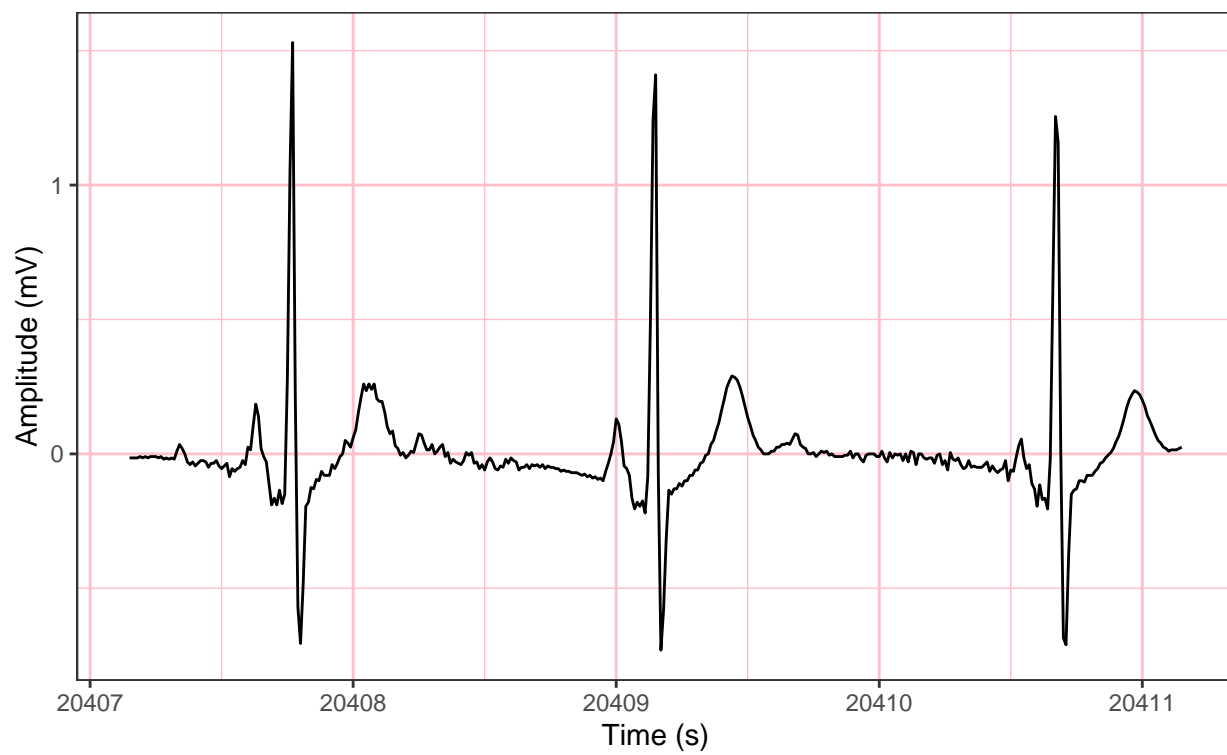
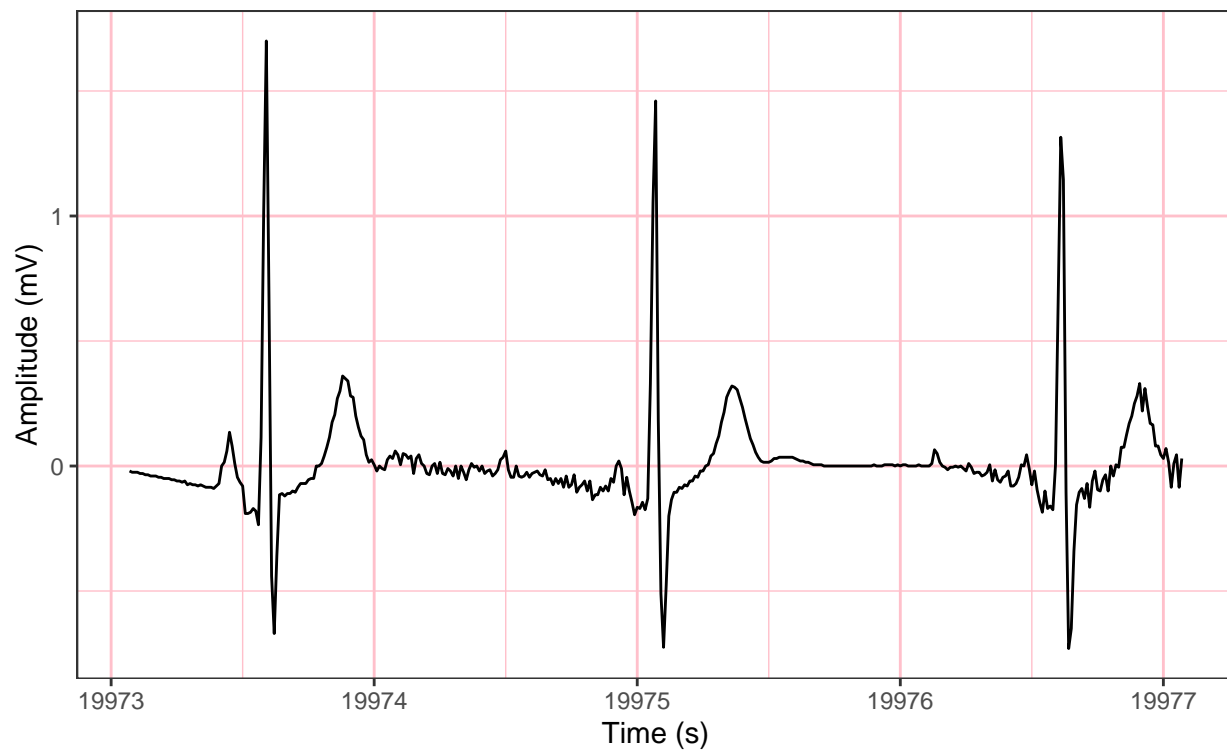


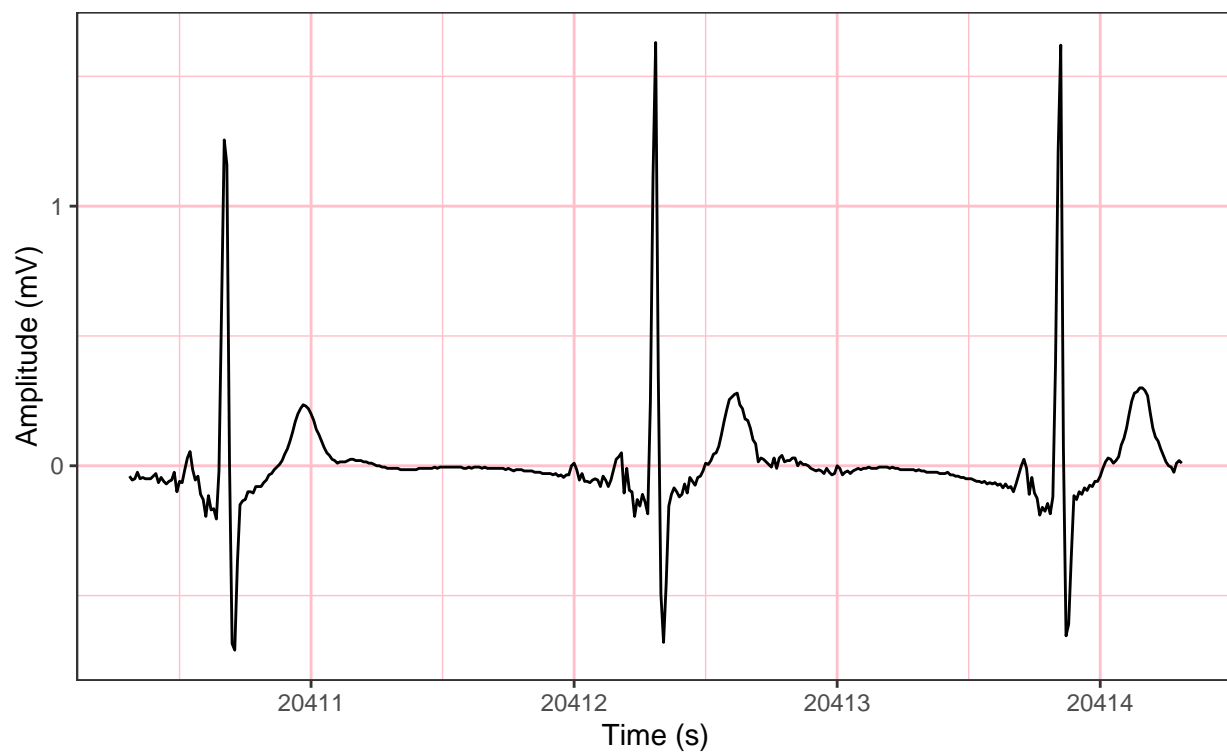
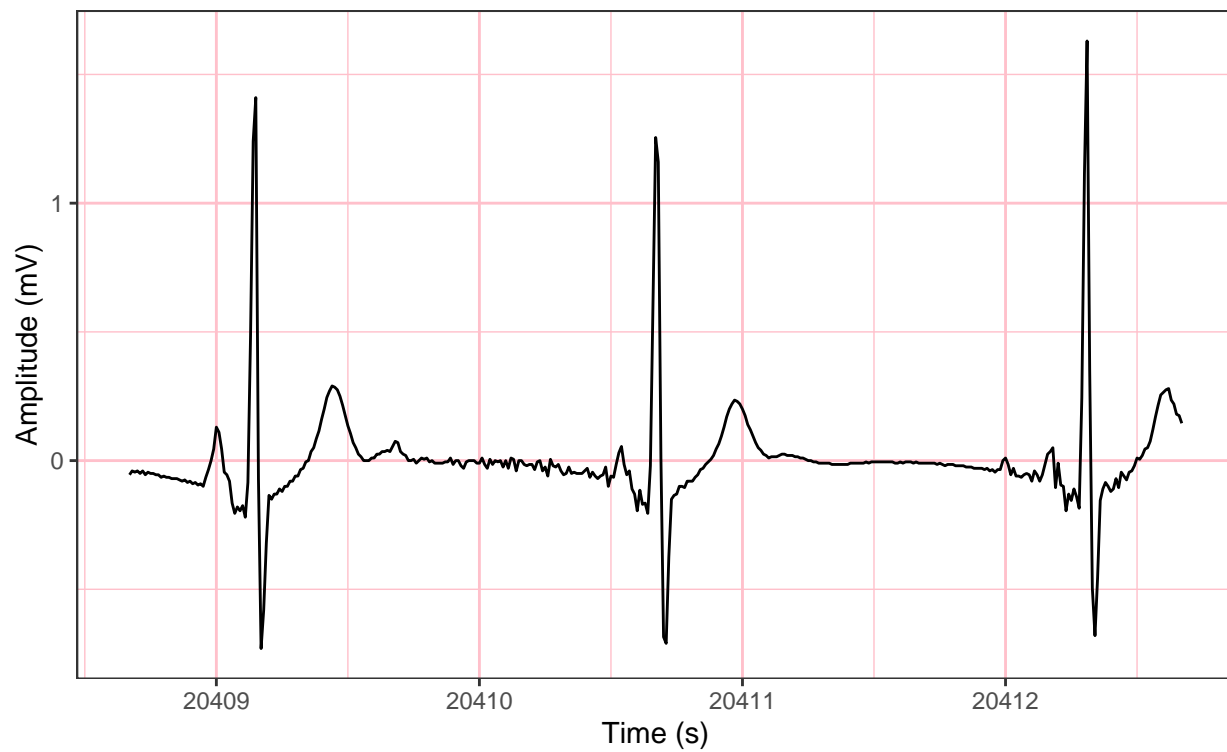


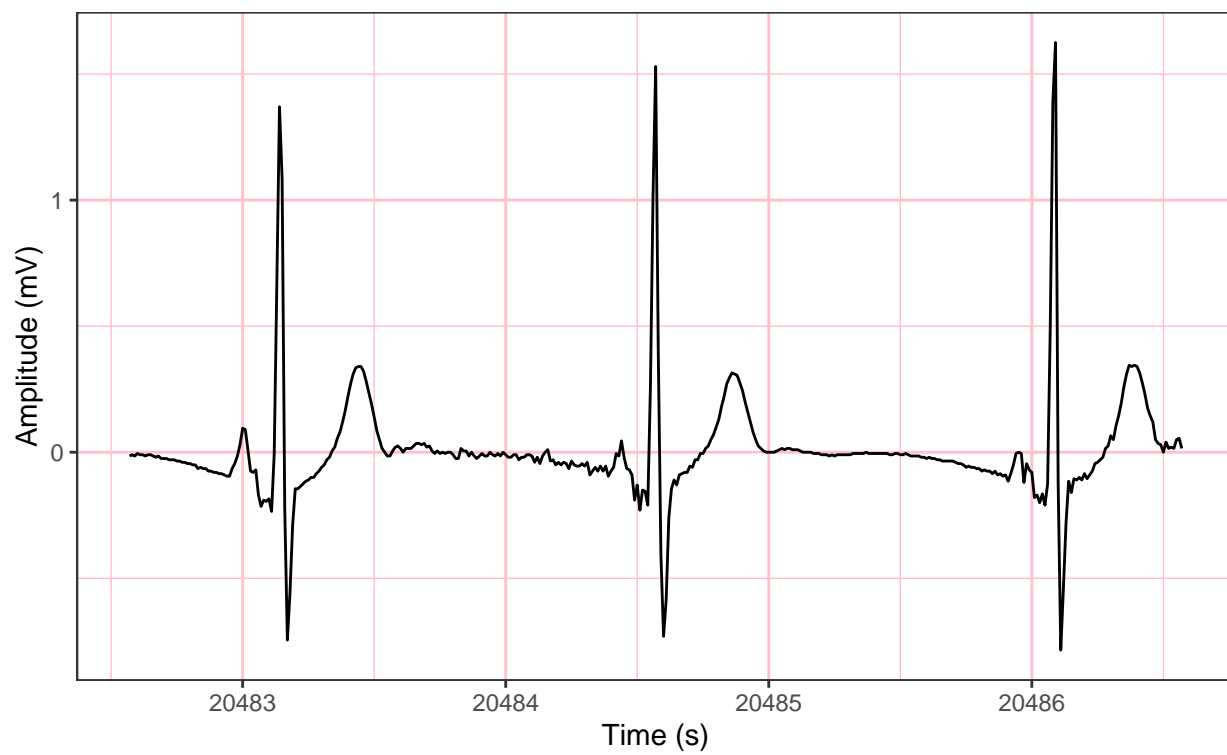
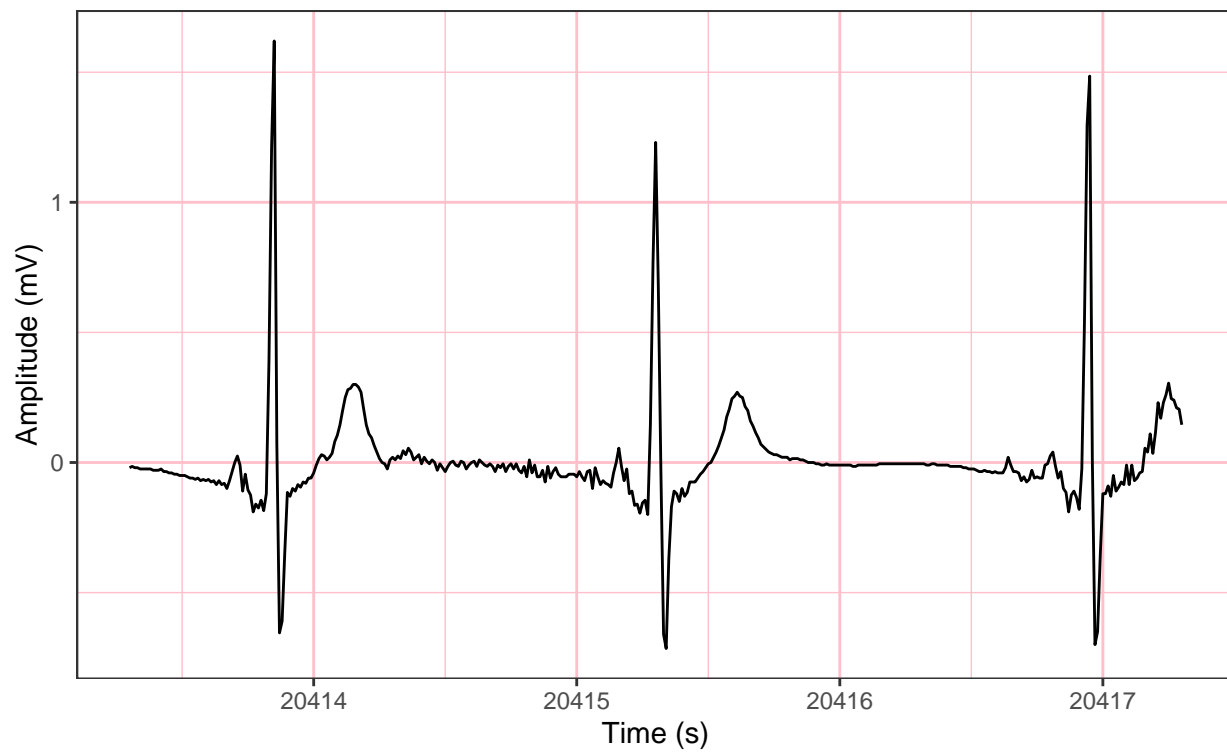


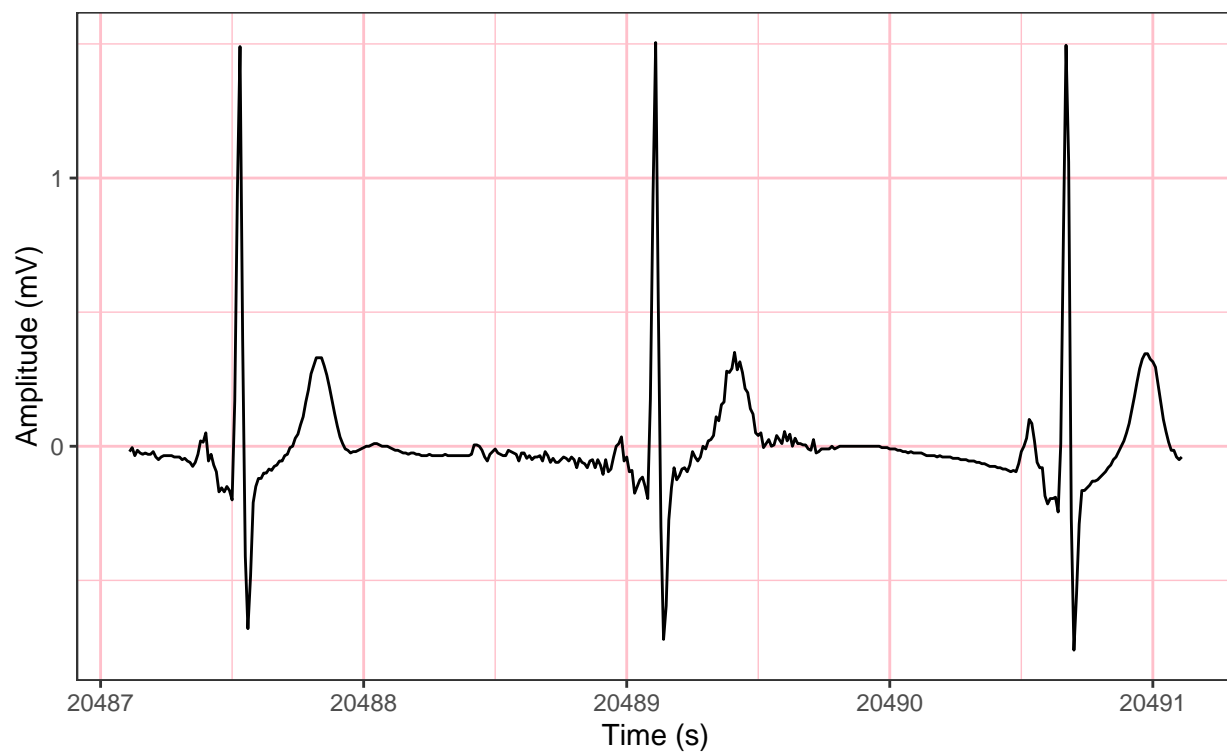
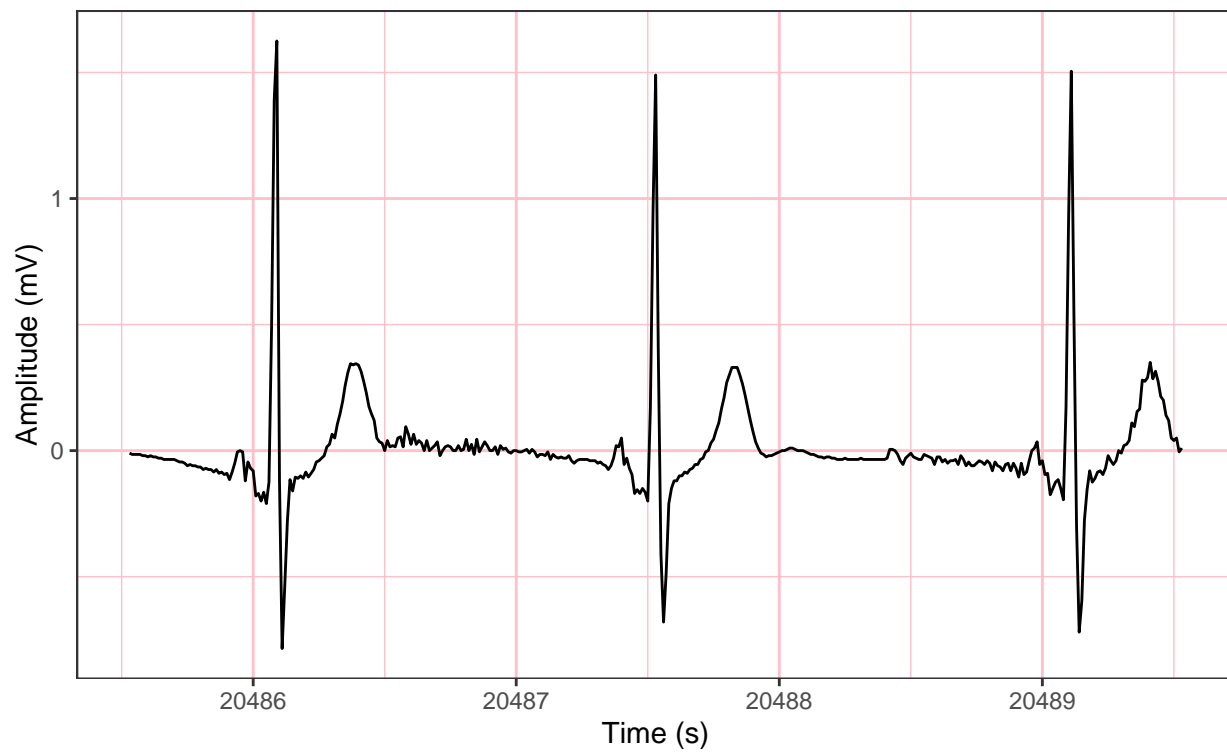


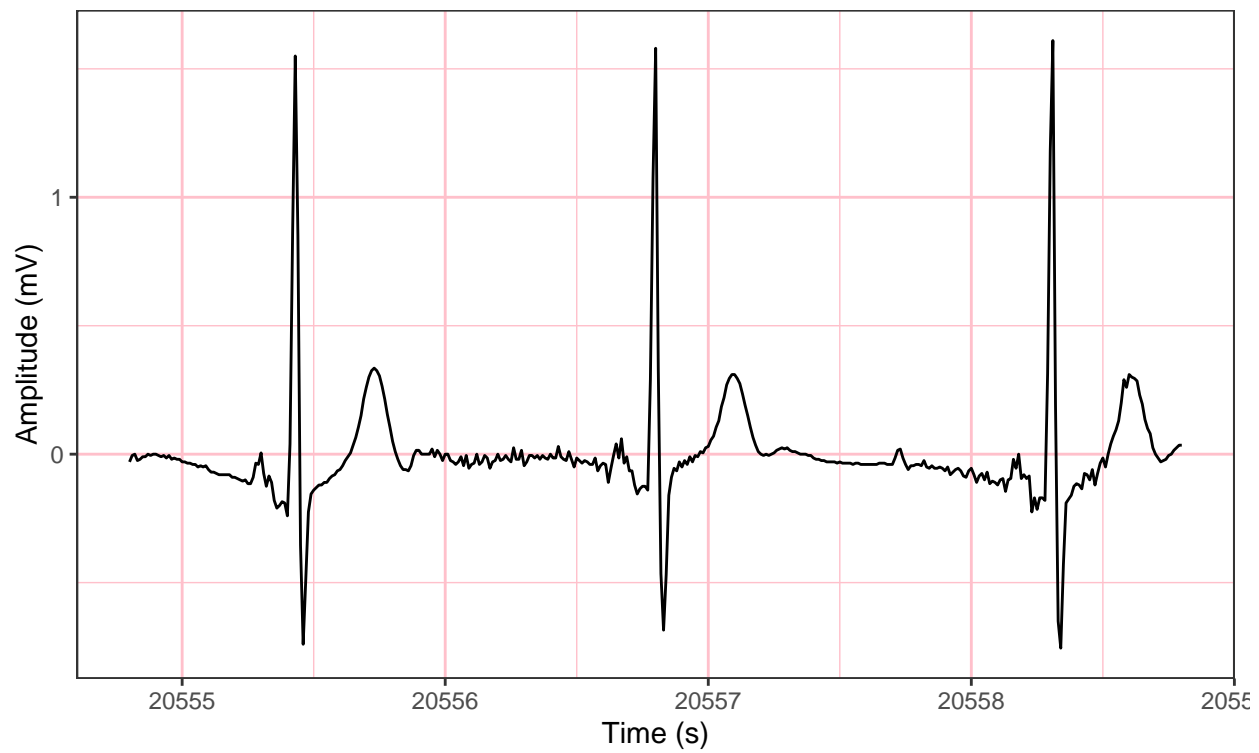
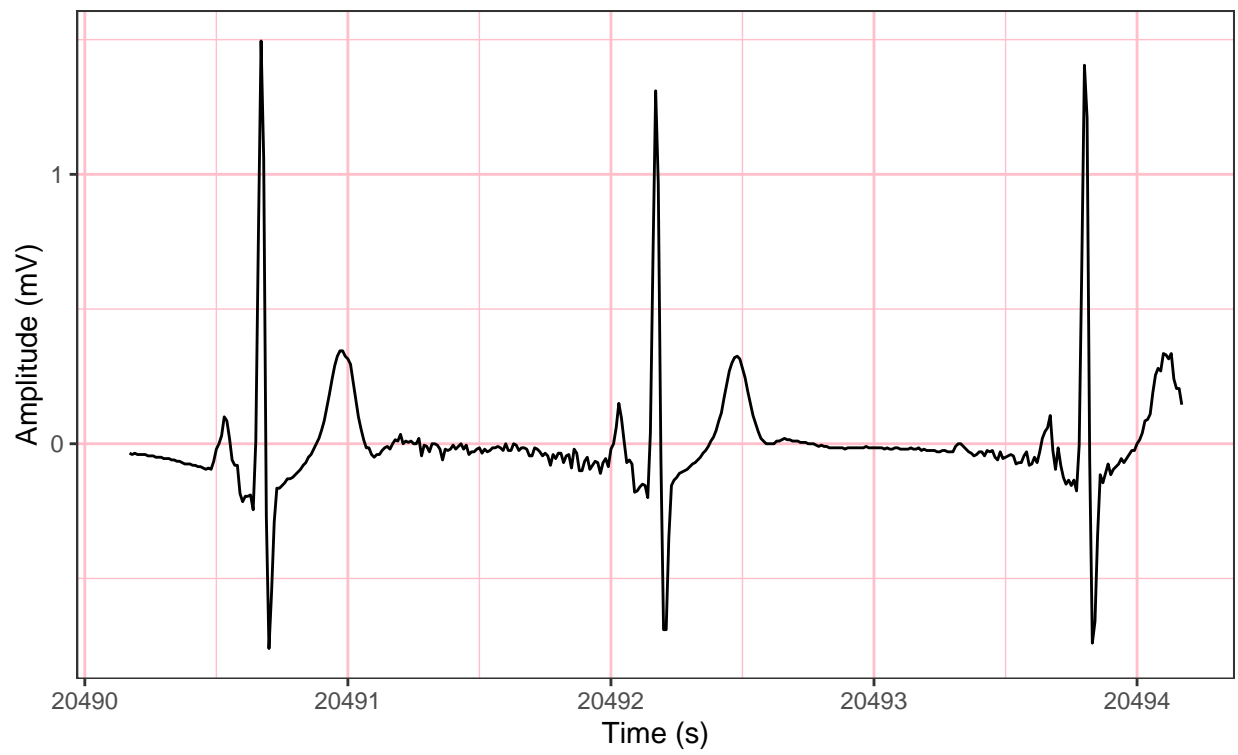


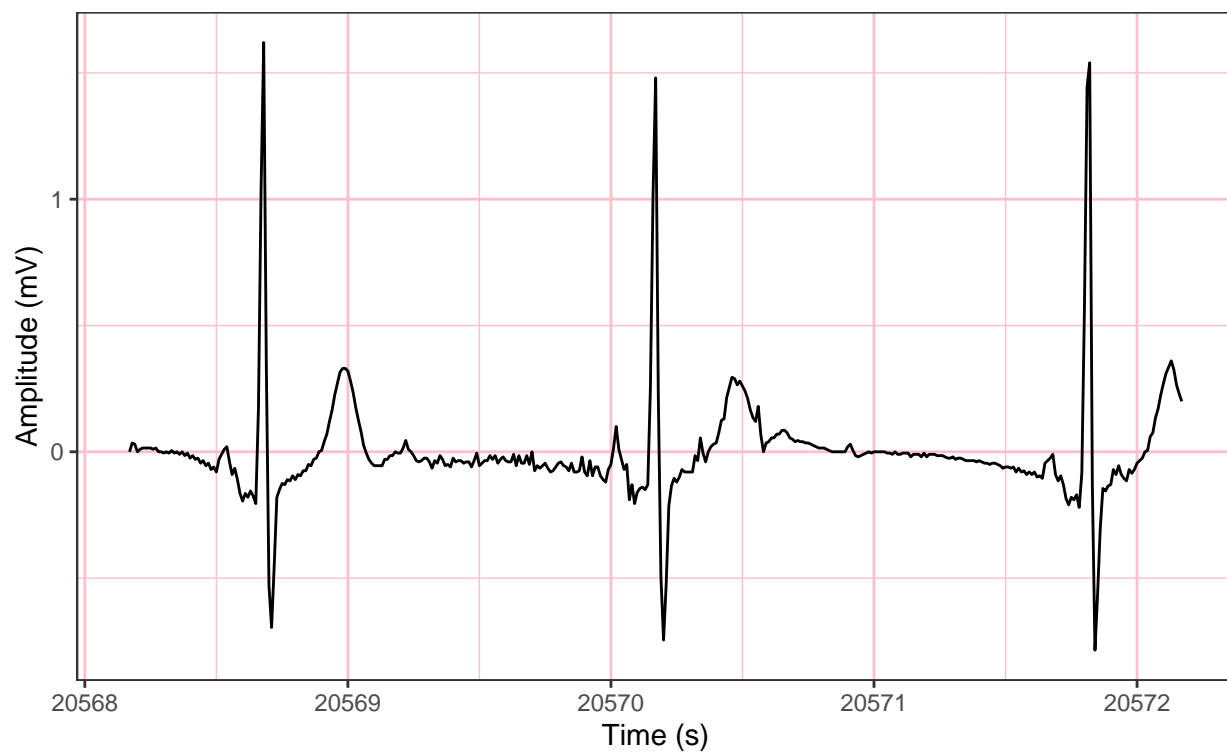
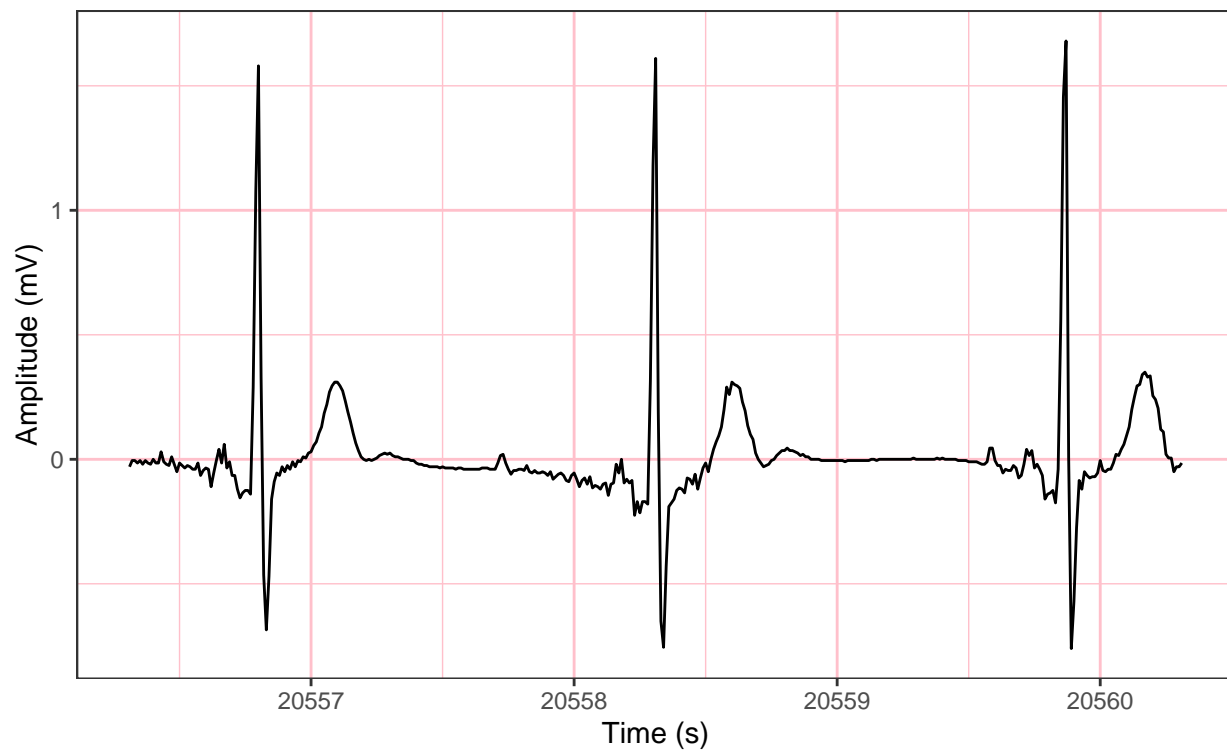


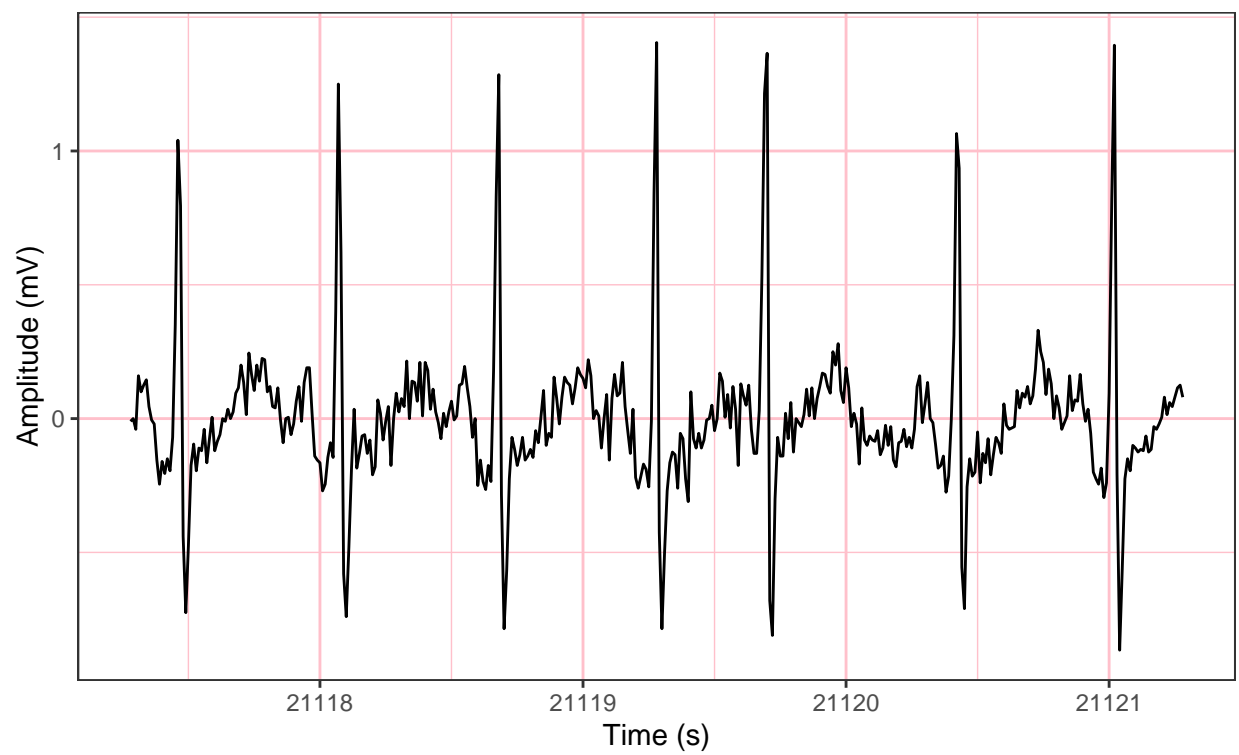
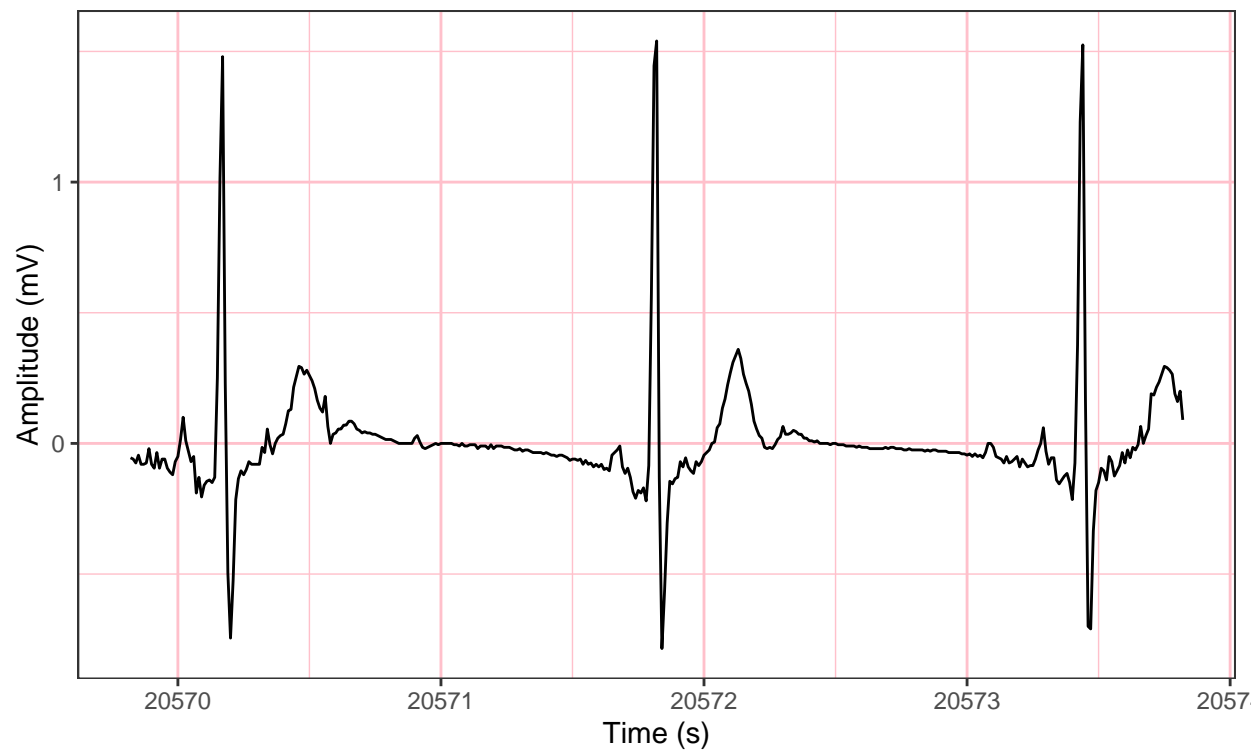


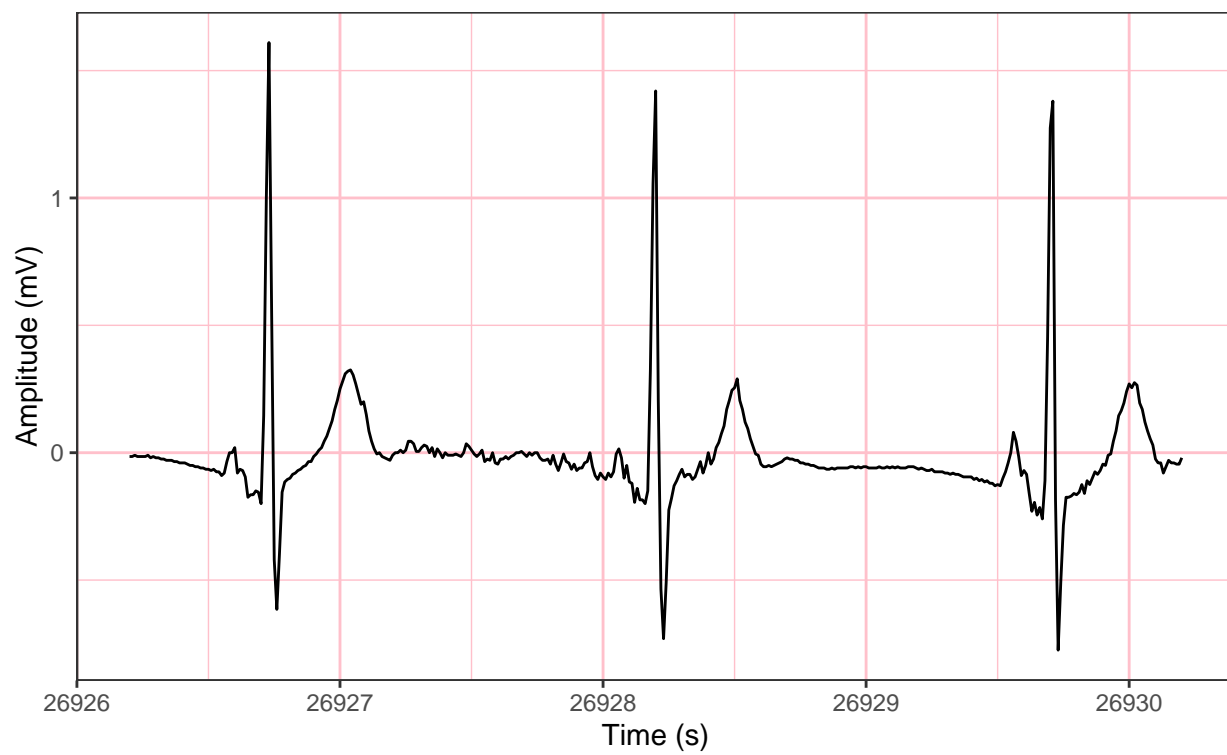
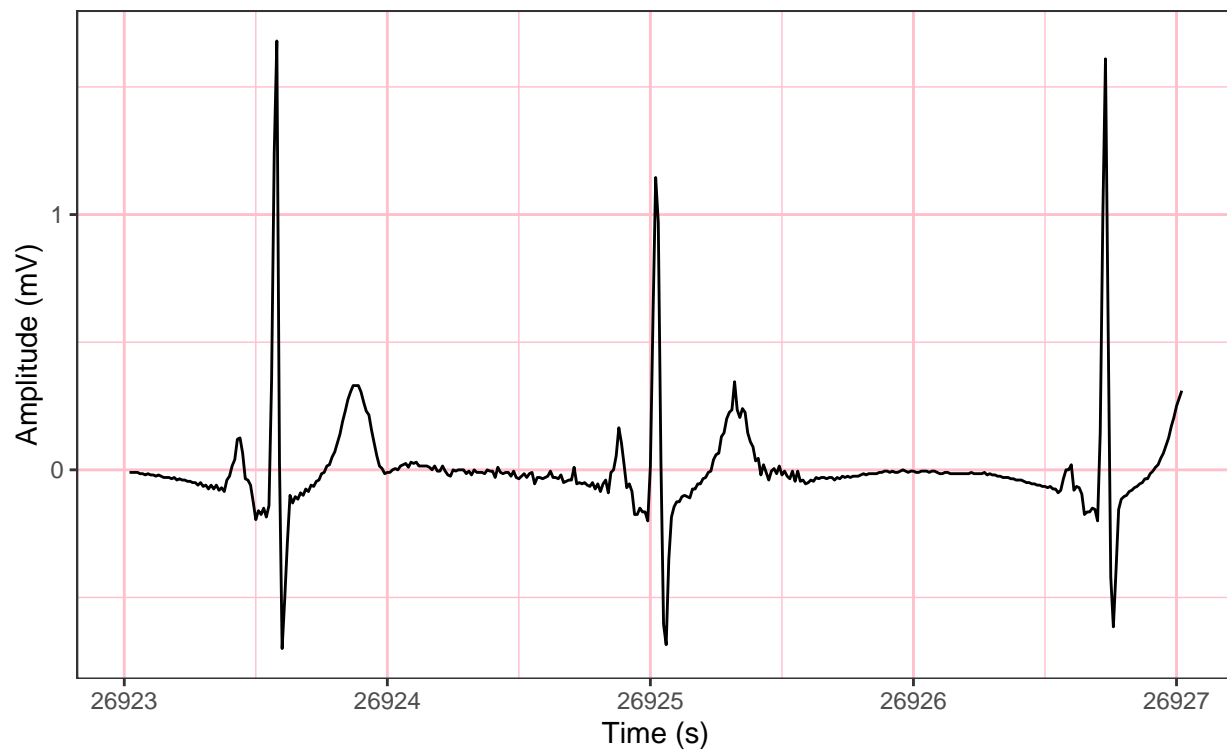


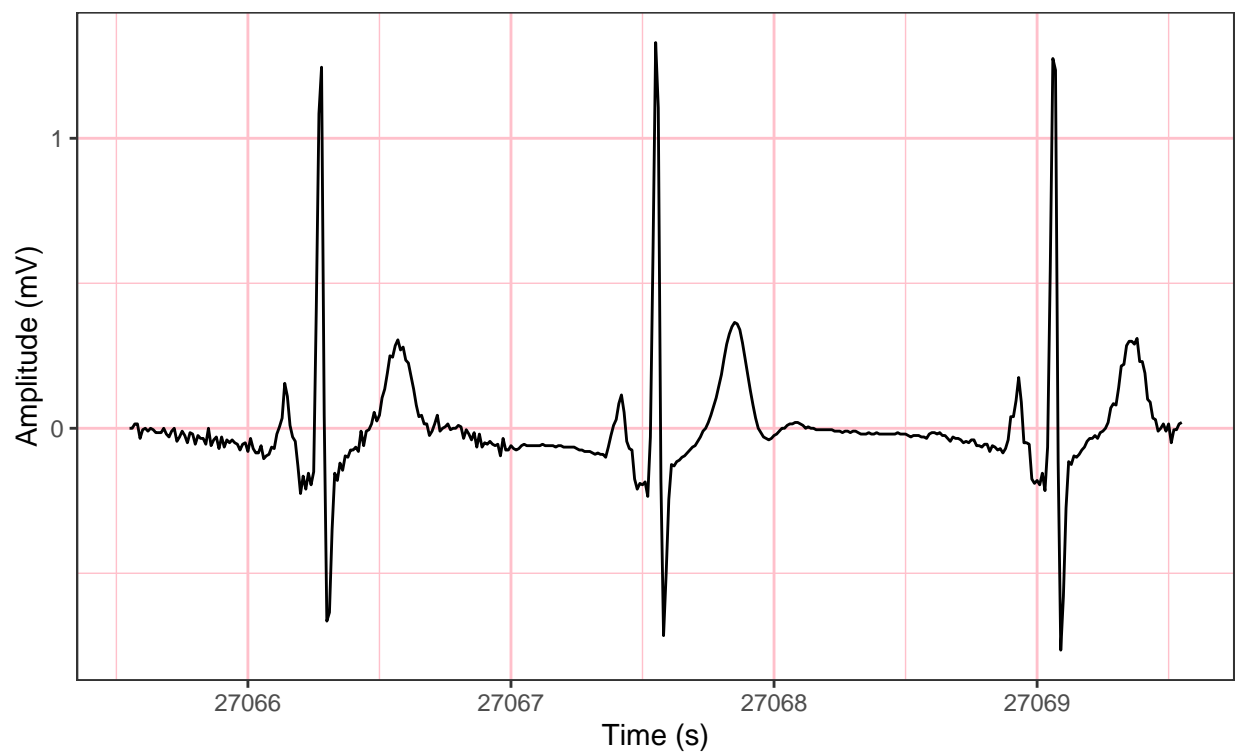
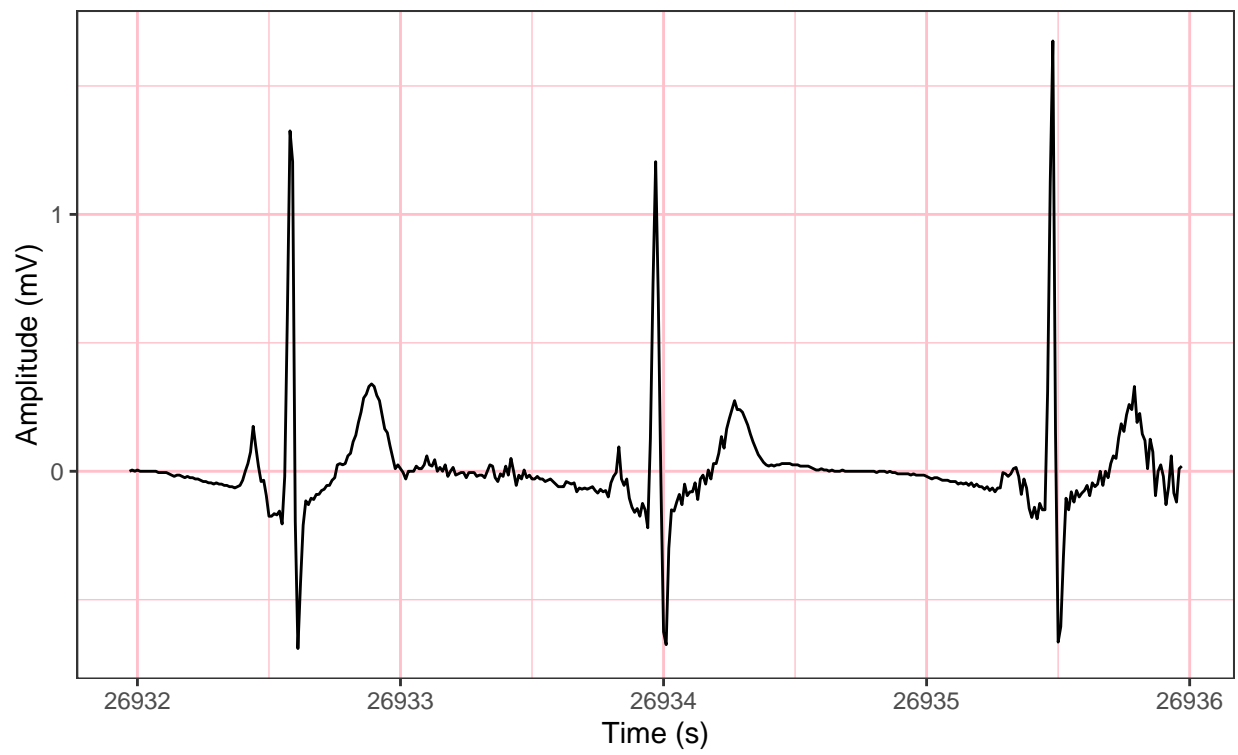


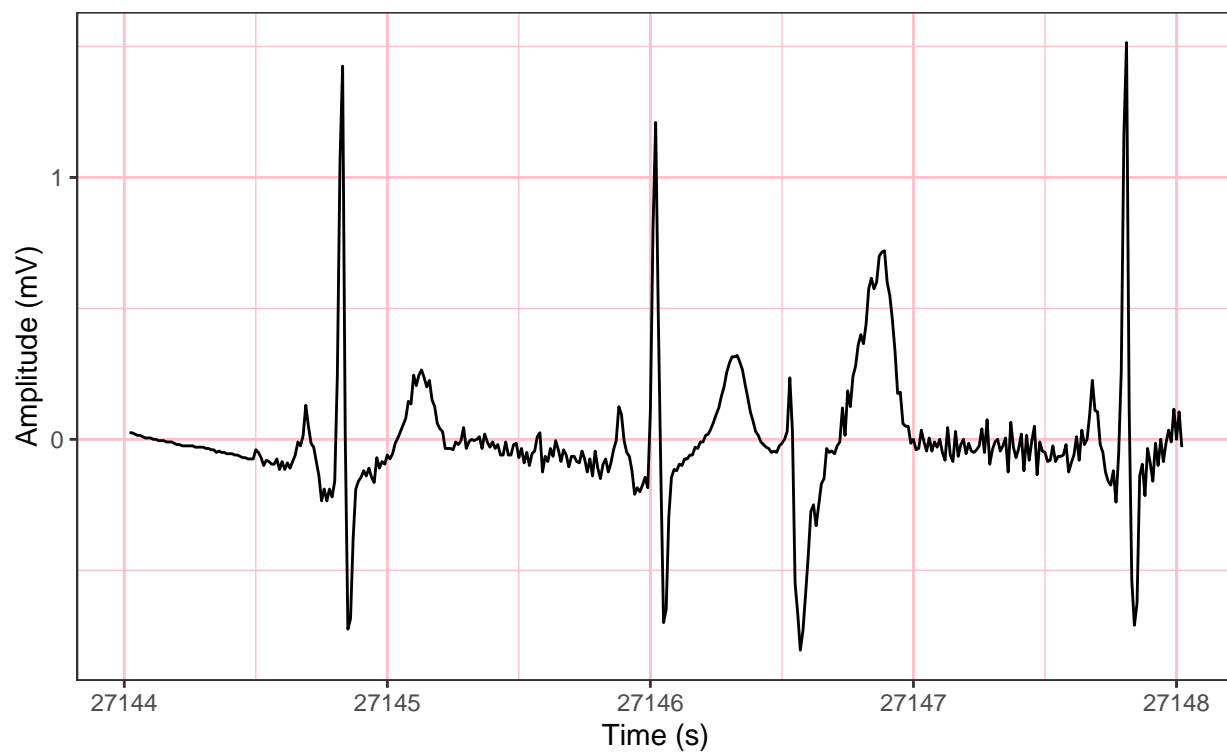
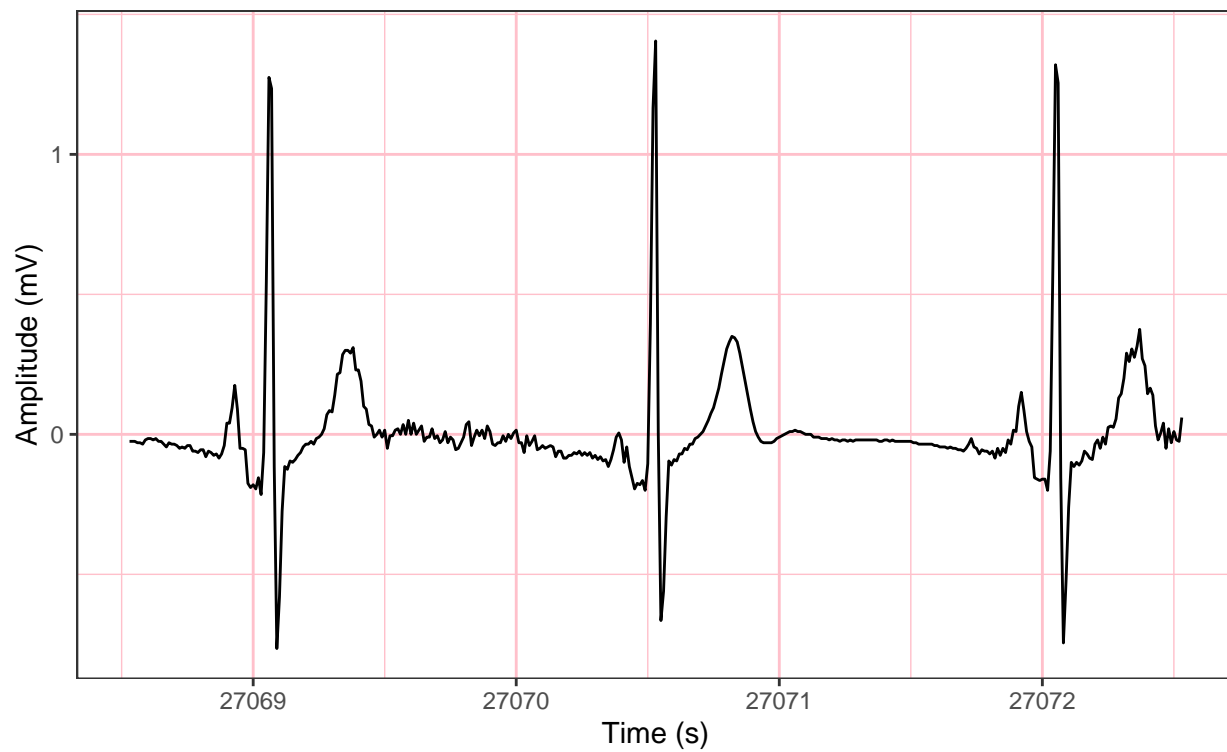












References

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- Penzel, T., Moody, G. B., Mark, R. G., Goldberger, A. L., & Peter, J. H. (2000). The apnea-ecg database. *Computers in Cardiology 2000*, 255–258.