

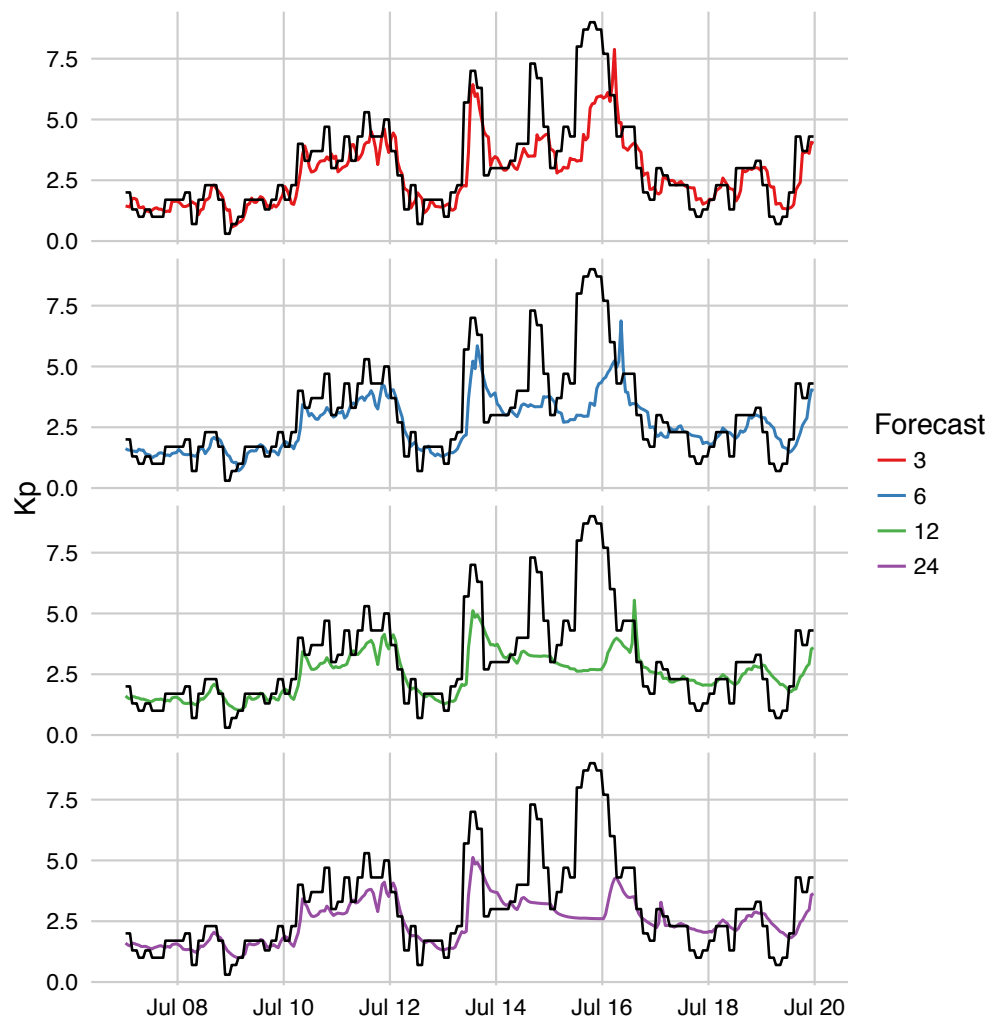


# **PRediction Of Geospace Radiation Environment and Solar wind parameterS**

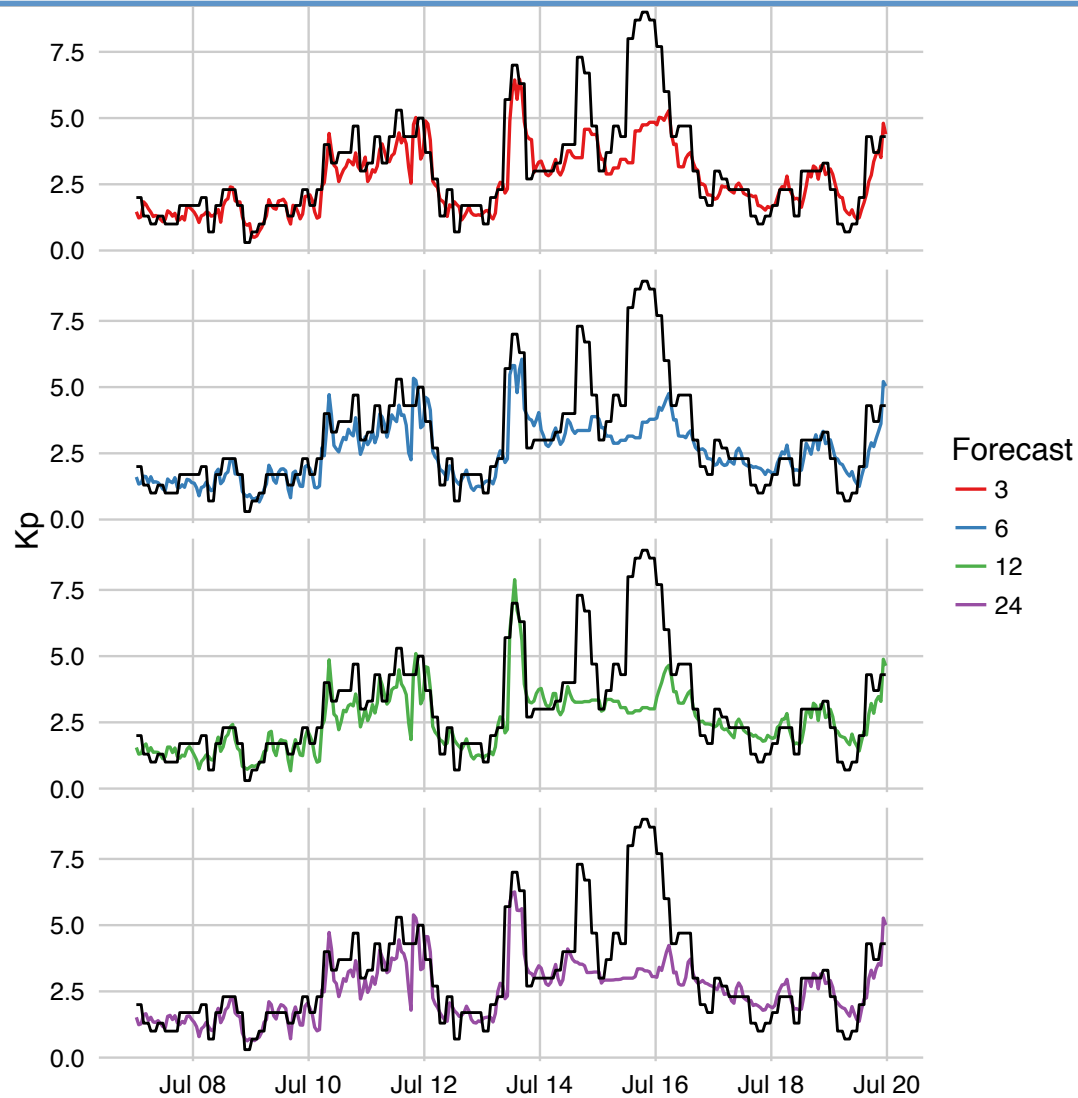
Project Overview

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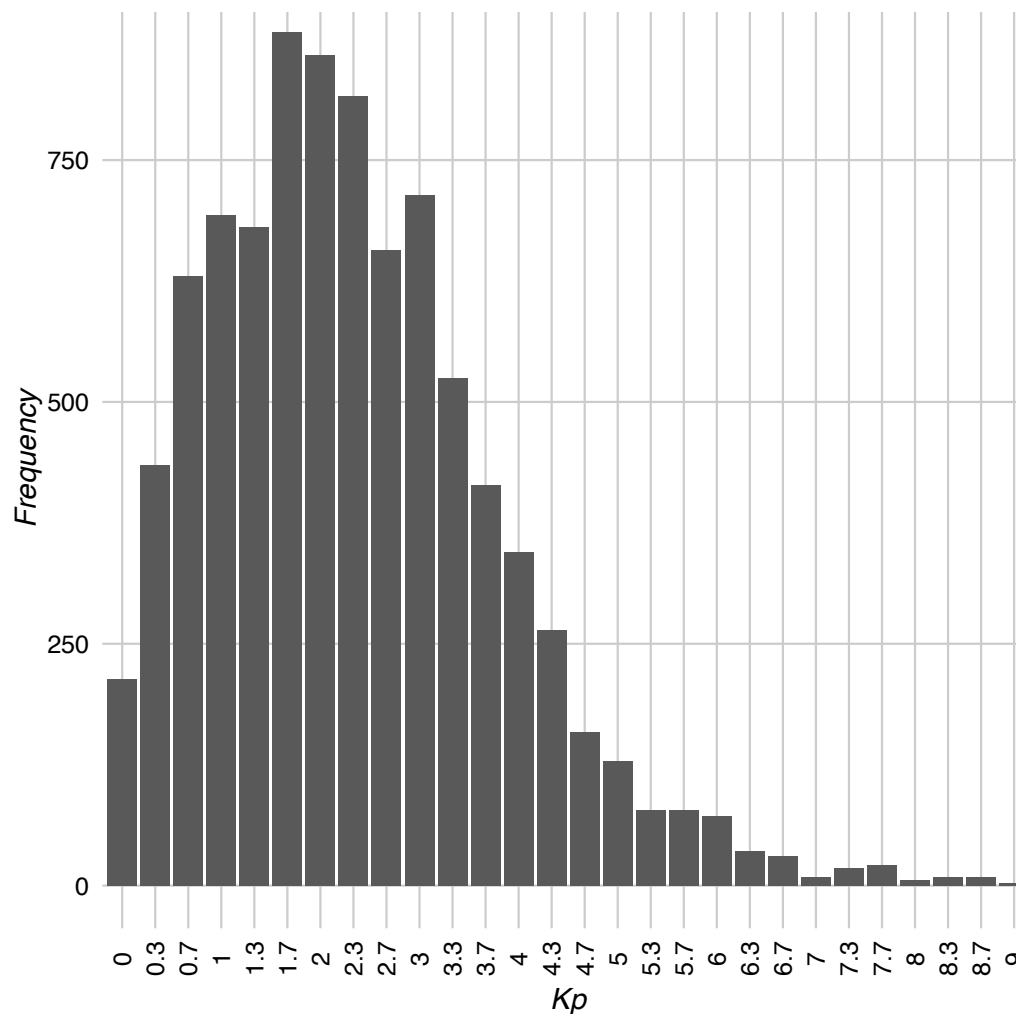
# Sliding model



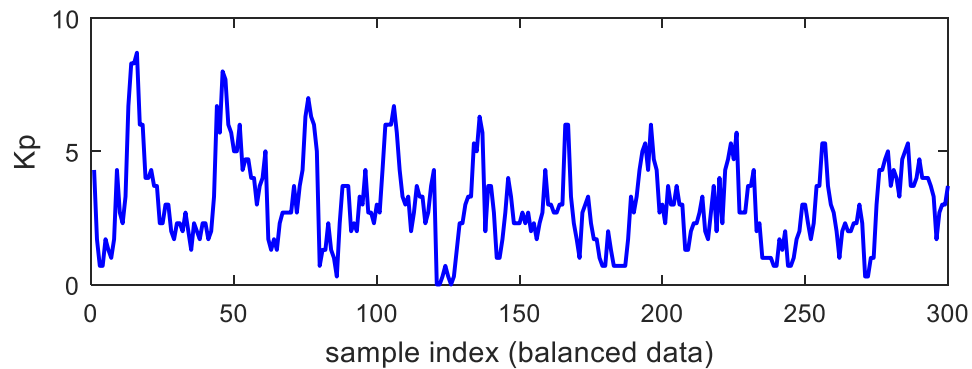
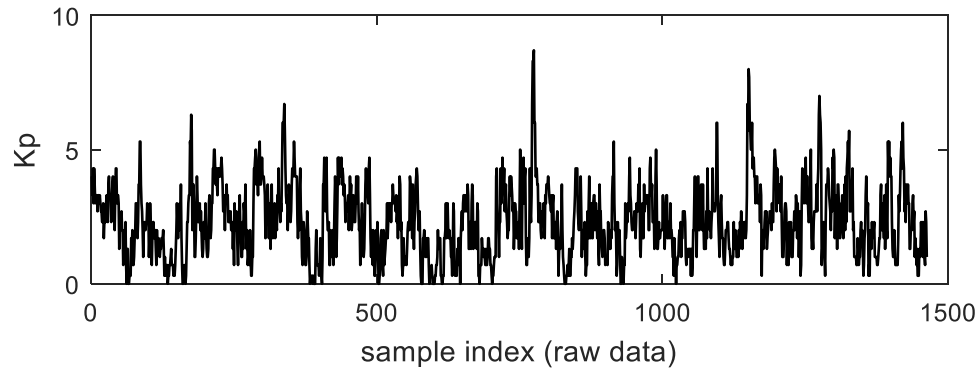
# Direct models



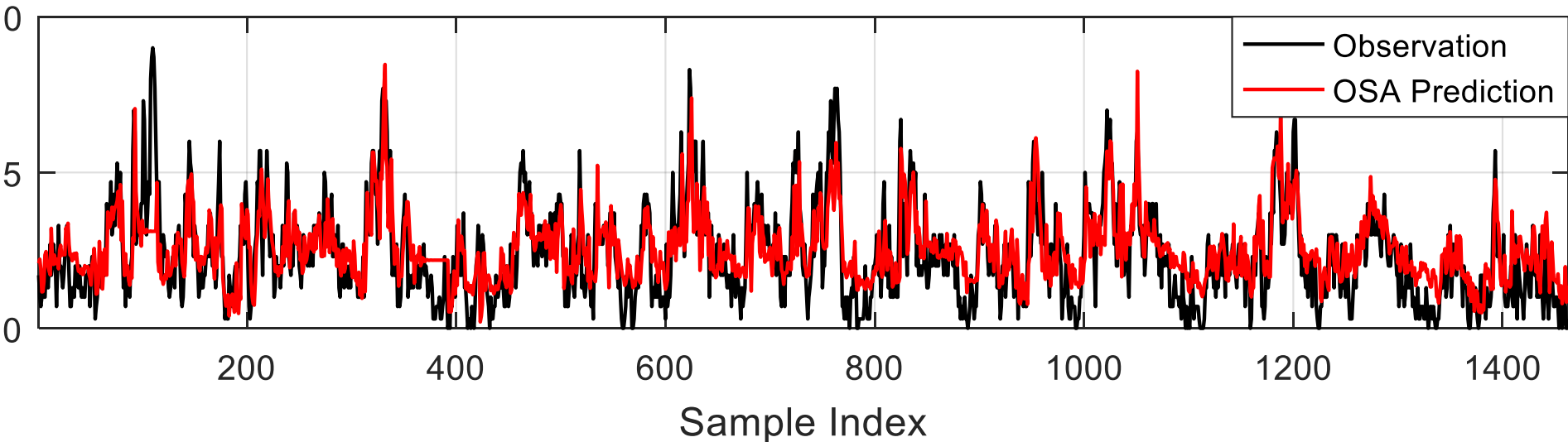
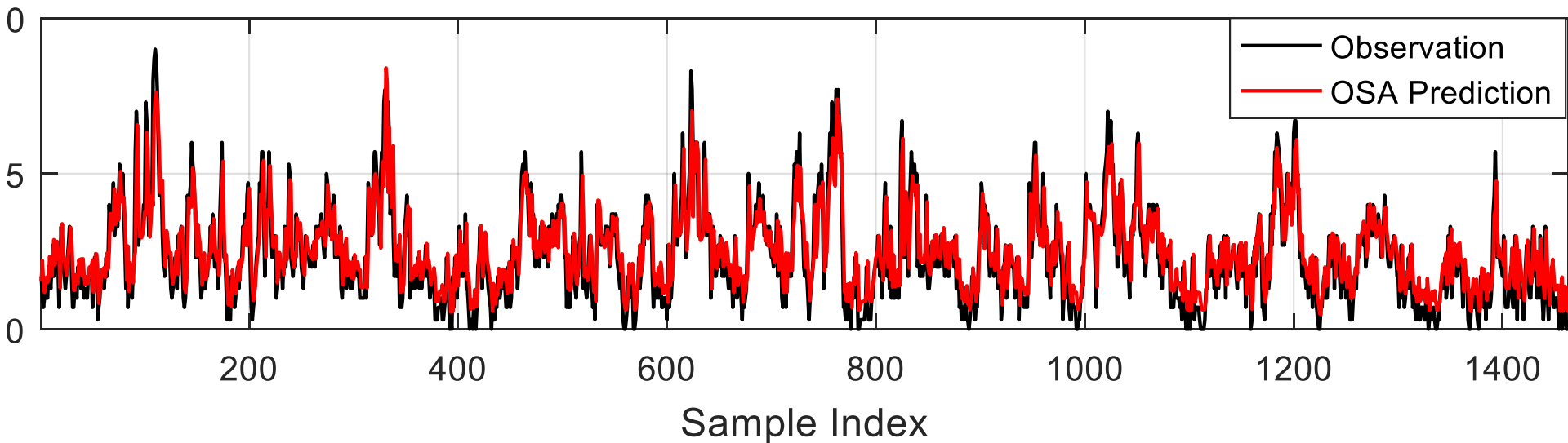
# Kp distribution



# Balancing input



# New Models



Two types of NARMAX models, were constructed for 3 hours ahead prediction of Kp index

- with autoregressive model terms
- without autoregressive terms (the Volterra series model),

The training data are resampled by using a data balancing method

- try to overcome the problem of little data at high/low Kp
- improve the prediction capacity of the model during active Kp times

The models can forecast the active times very well

The correlation of predicted and observed Kp index of the two models is 0.82 and 0.69, respectively.

Overall, the models cannot only be used for Kp forecast, but also provide a useful transparent and compact representation of the relationship between Kp index and solar wind variables.