

# Figures and Tables

Satyam Agnihotri

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Model Type	Statistic	Number of Alarms	Number of false alarms
Fixed PCA	SPE	37	36
Fixed PCA	$T^2$	20	19
Adaptive PCA	SPE	21	20
Adaptive PCA	$T^2$	9	8

Table 1: Alarms raised for training set 1 to 50 and monitoring set 51 to 150

Model Type	Statistic	Number of Alarms	Number of false alarms
Fixed PCA	SPE	14	12
Fixed PCA	$T^2$	11	8
Adaptive PCA	SPE	11	9
Adaptive PCA	$T^2$	8	5

Table 2: Alarms raised for training set 1 to 250 and monitoring set 251 to 527

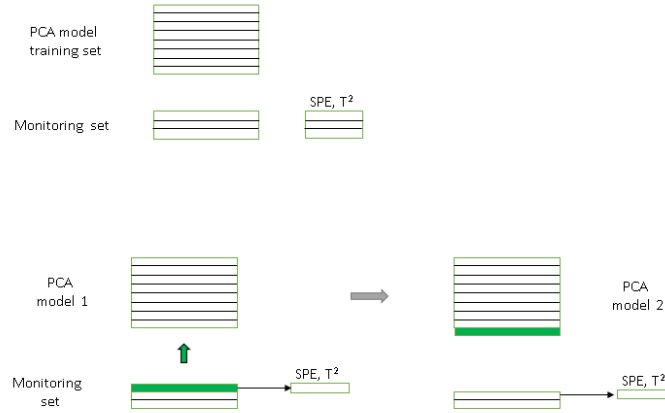


Figure 1: Fixed and Adaptive PCA schematic

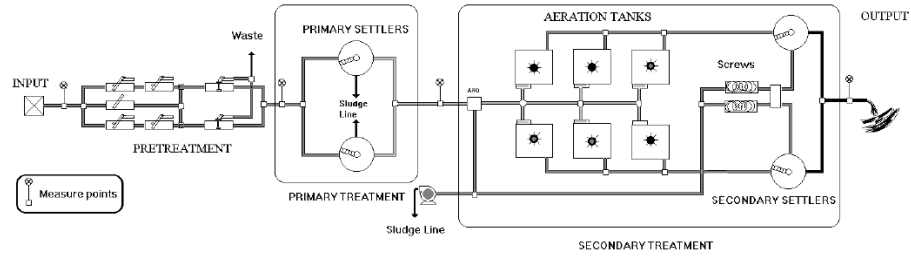


Figure 2: WWTP schematic

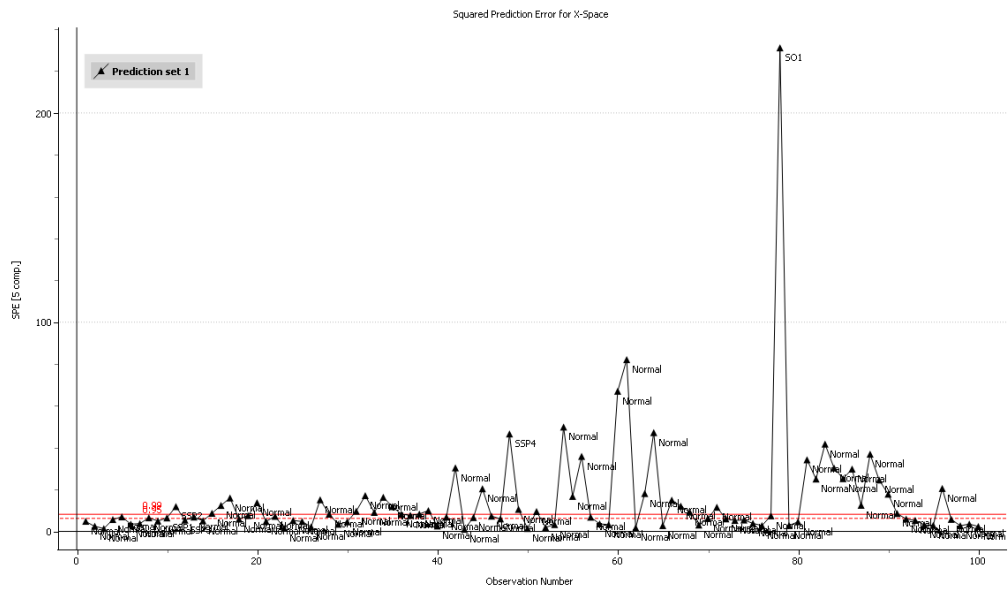


Figure 3: Fixed model SPE for prediction set (51 to 150)

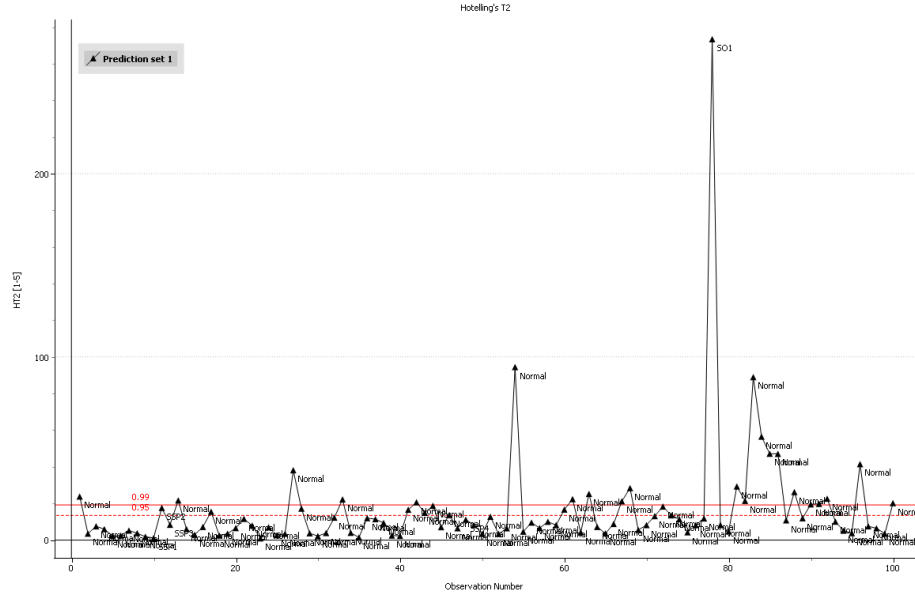


Figure 4: Fixed model  $T^2$  for prediction set (51 to 150)

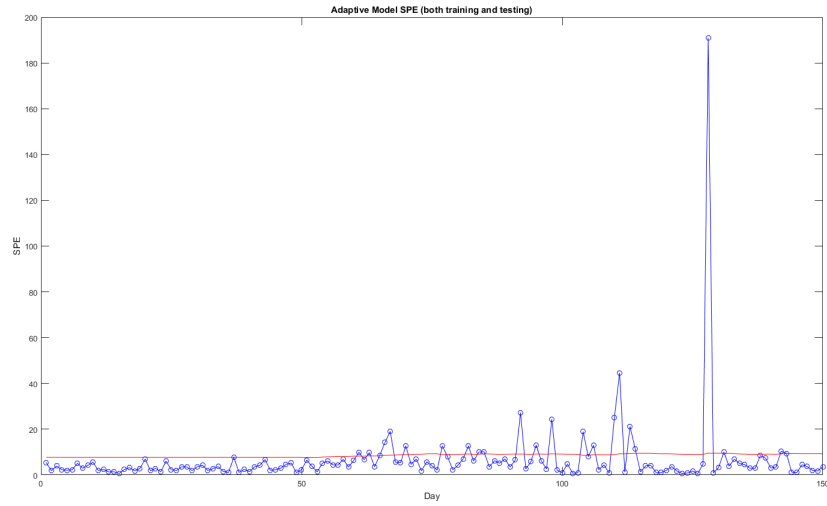


Figure 5: Adaptive model SPE, both training (1 to 50) and monitoring set (51 to 150)

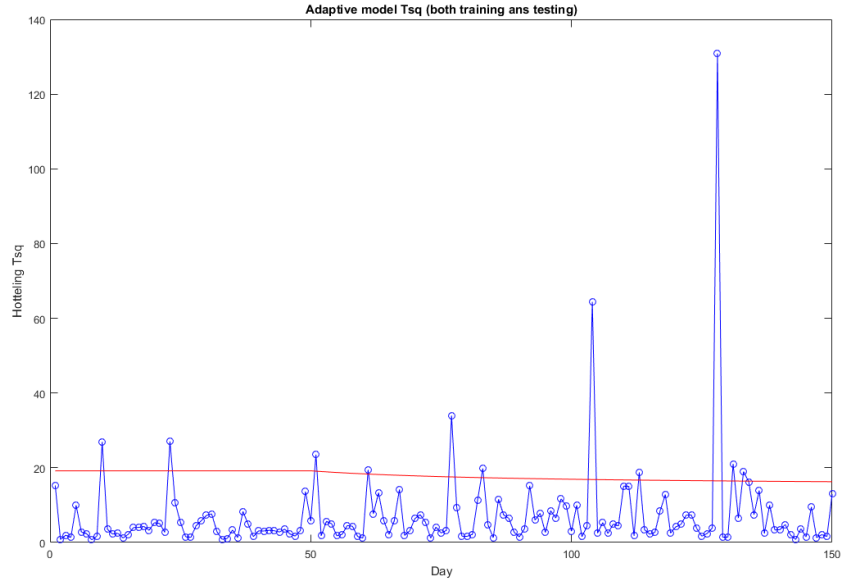


Figure 6: Adaptive model  $T^2$ , both training (1 to 50) and monitoring set (51 to 150)

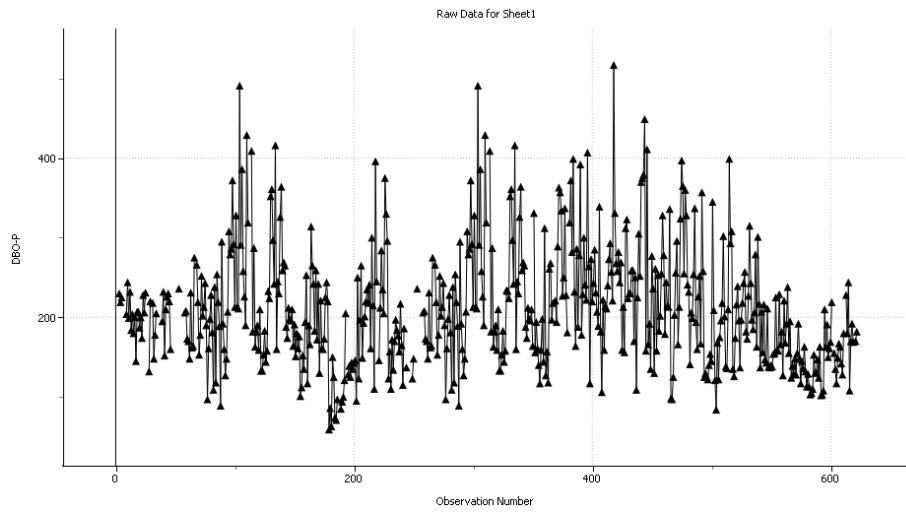


Figure 7: Evolution of BOD with time (days)

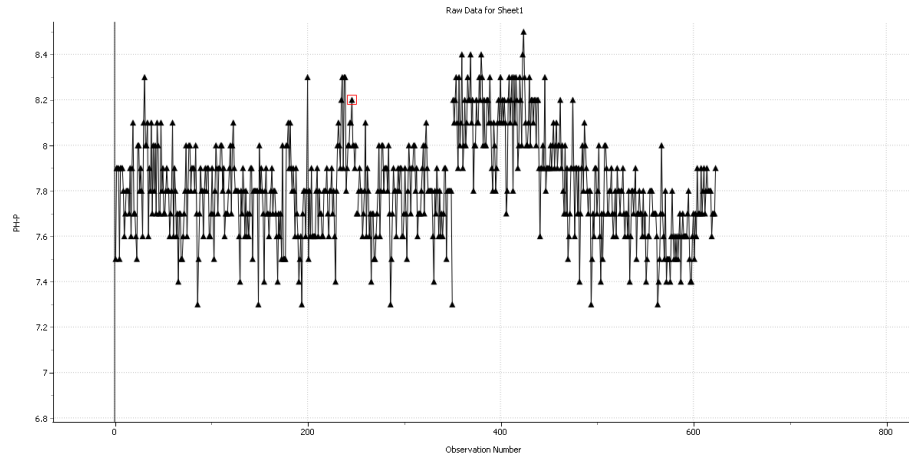


Figure 8: Evolution of pH with time

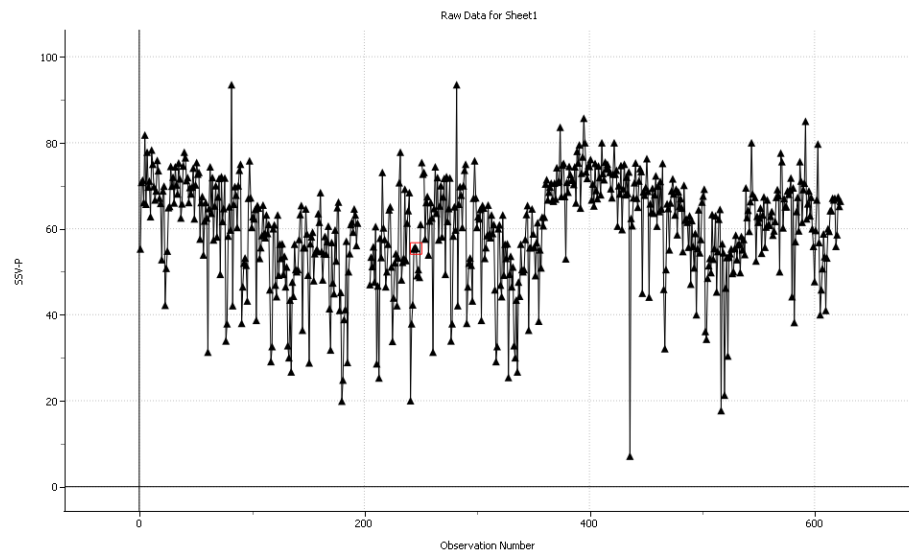


Figure 9: Evolution of VSS with time

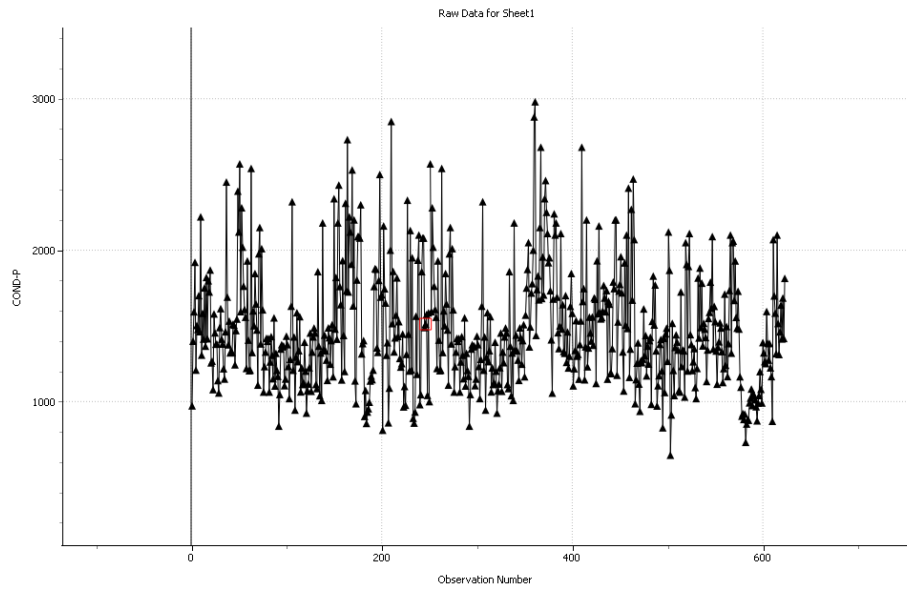


Figure 10: Evolution of Conductivity with time

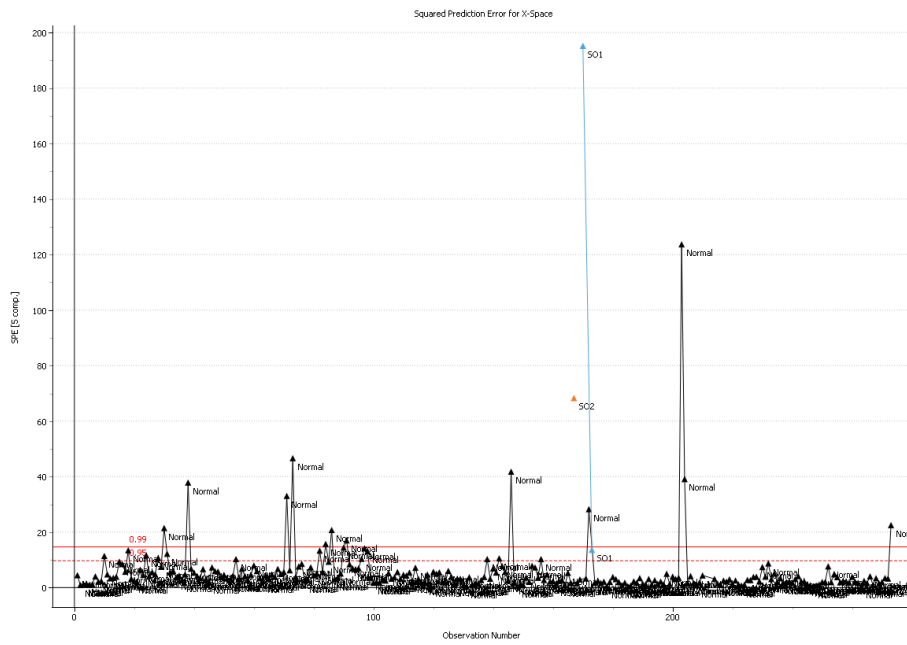


Figure 11: Fixed model SPE of monitoring set (251 to 527)

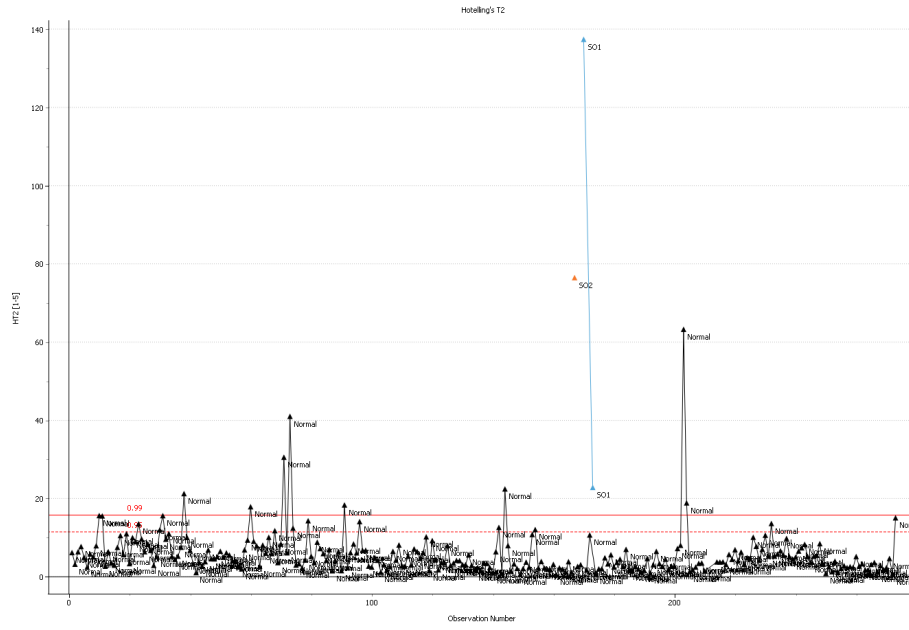


Figure 12: Fixed model  $T^2$  of monitoring set (251 to 527)

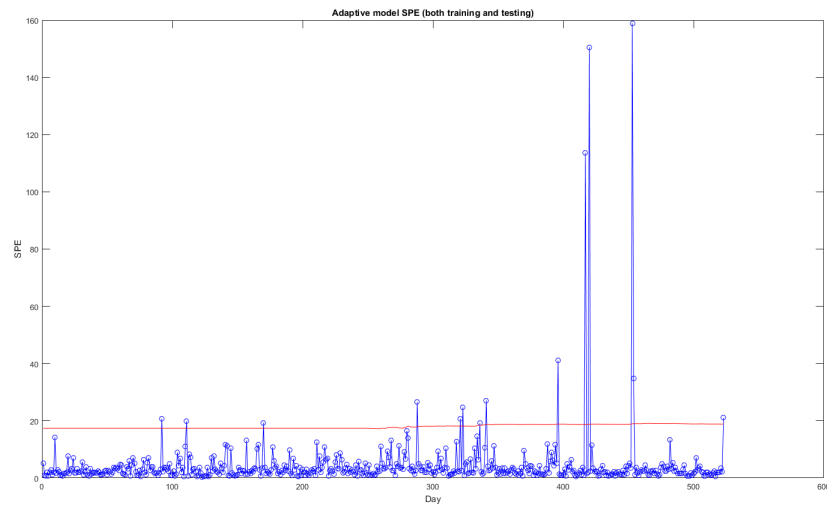


Figure 13: Adaptive model SPE, both training (1 to 250) and monitoring set (251 to 527)



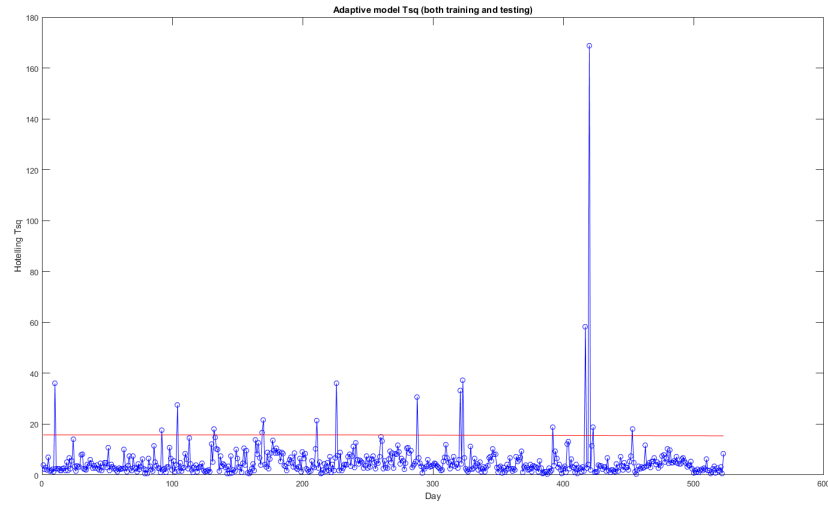


Figure 14: Adaptive model  $T^2$ , both training (1 to 250) and monitoring set (251 to 527)

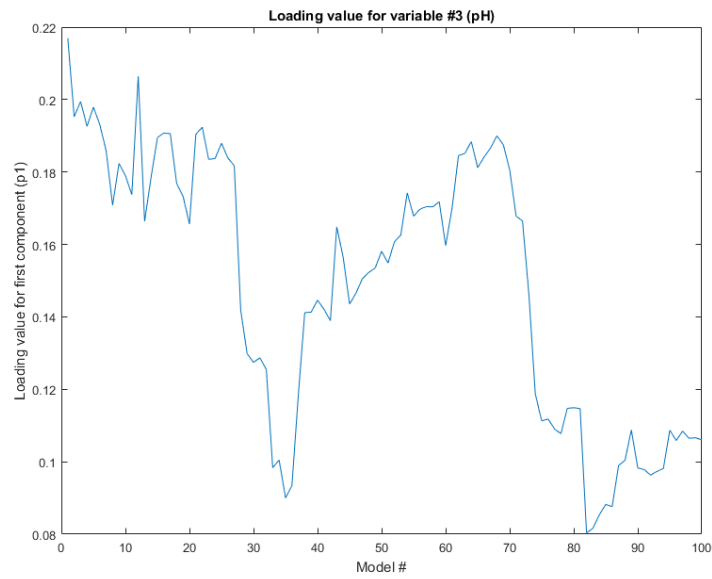


Figure 15: Evolution of First component loading values corresponding to variable #3 (pH)

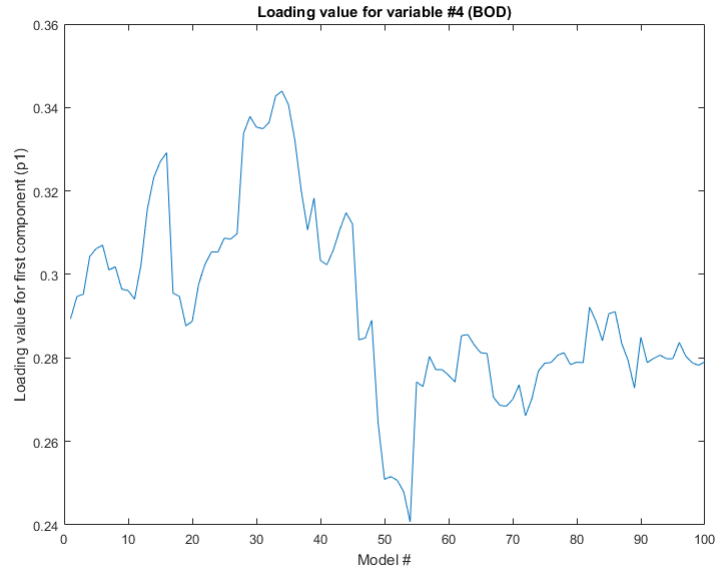


Figure 16: Evolution of First component loading values corresponding to variable #4 (BOD)

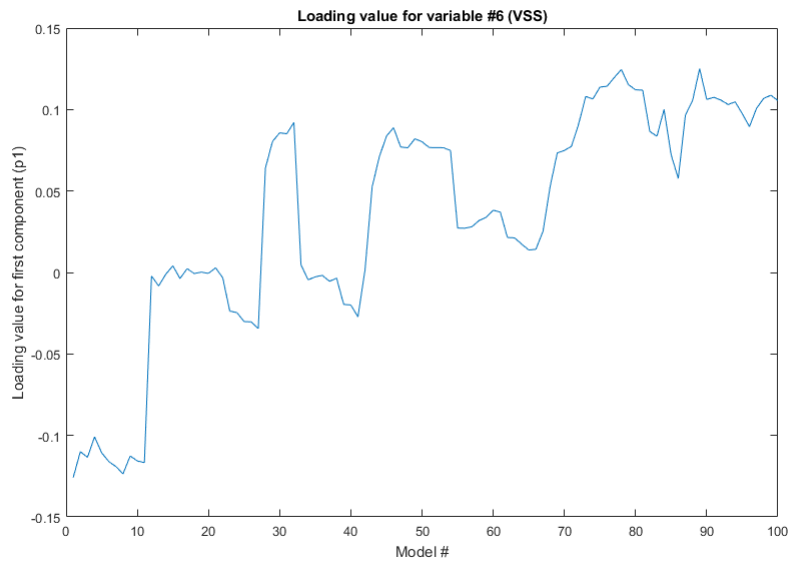


Figure 17: Evolution of First component loading values corresponding to variable #6 (VSS)

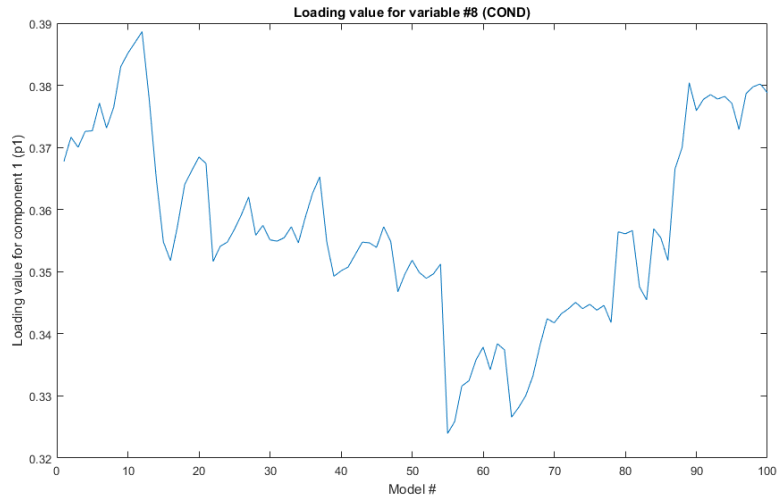


Figure 18: Evolution of First component loading values corresponding to variable #8 (COND)

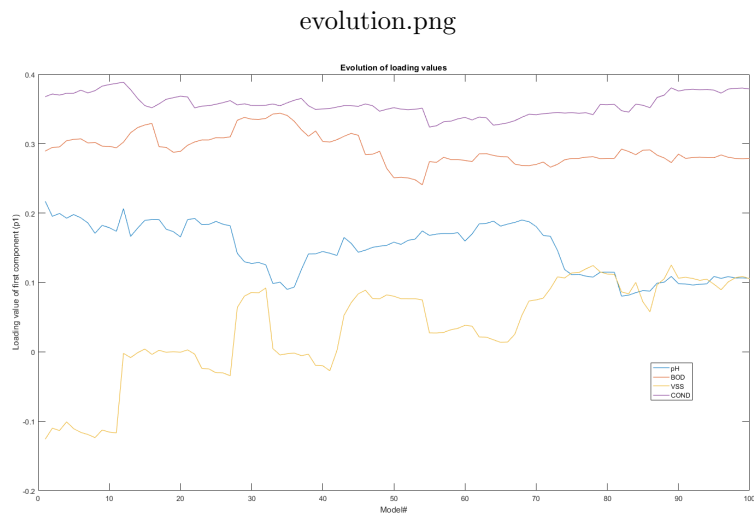


Figure 19: Evolution of loading values (component 1) of the 4 variables from figure 15,16,17,18