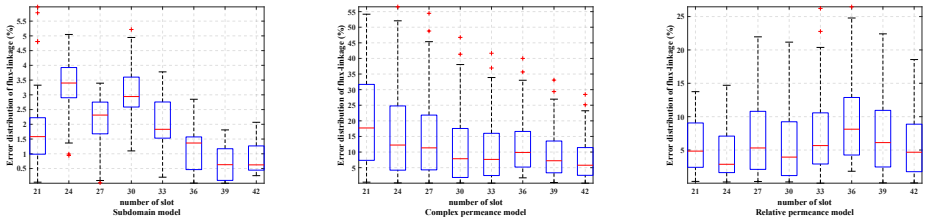
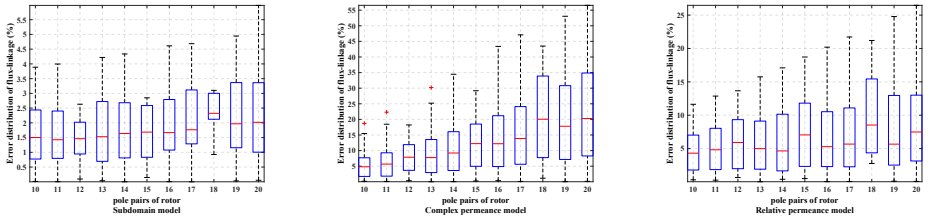
We have drawn the box plots which can illustrate more information of the error distribution changed with the key parameters in the next figures.

The error distribution changing with the key parameters in the conventional PMSM is shown in the Figs. 1, 2 and 3. On each box, the central mark indicates the median, and the bottom and top edges of the box indicate the 25th and 75th percentiles, respectively. The outliers are plotted individually using the '+' symbol.



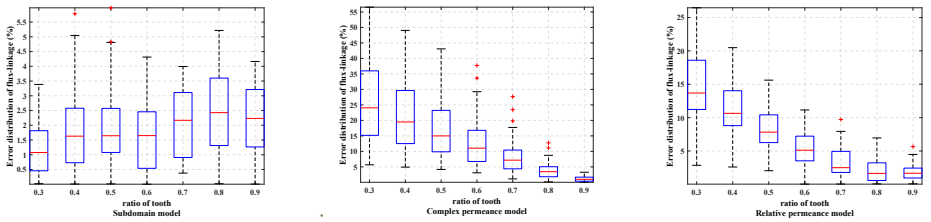

(a) Subdomain model (b) Complex permeance model (c) Relative permeance model

Figure 1: Error distribution changing with number of slots (Conventional PMSM)




(a) Subdomain model (b) Complex permeance model (c) Relative permeance model

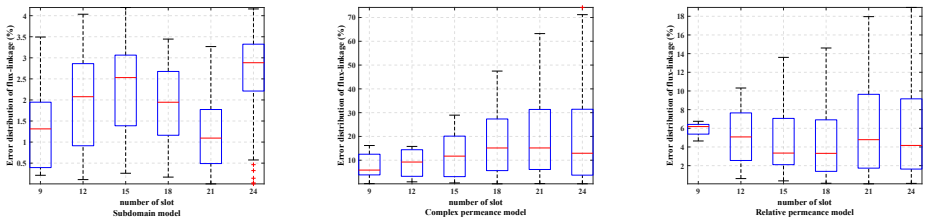
Figure 2: Error distribution changing with pole-pairs of rotor (Conventional PMSM)




(a) Subdomain model (b) Complex permeance model (c) Relative permeance model

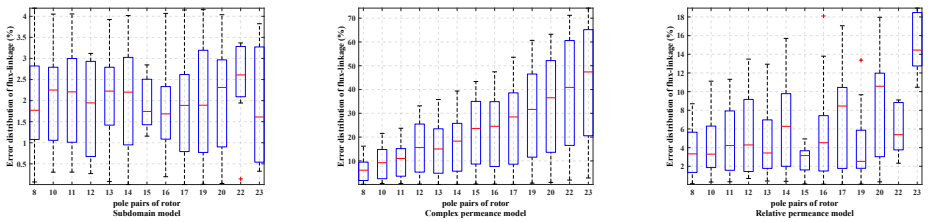
Figure 3: Error distribution changing with ratio of tooth (Conventional PMSM)

The error distribution changed with the key parameters in the Vernier PMSM is shown in the Figs. 4, 5 and 6.



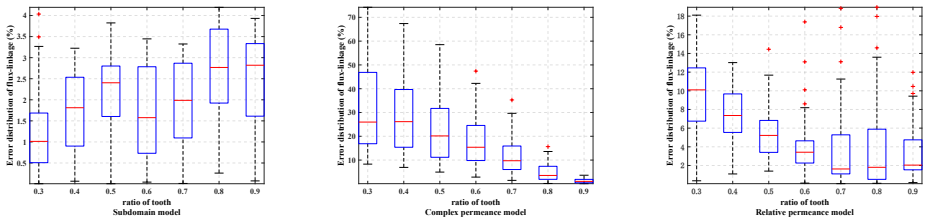

(a) Subdomain model (b) Complex permeance model (c) Relative permeance model

Figure 4: Error distribution changing with number of slots (Vernier PMSM)




(a) Subdomain model (b) Complex permeance model (c) Relative permeance model

Figure 5: Error distribution changing with pole-pairs of rotor (Vernier PMSM)




(a) Subdomain model (b) Complex permeance model (c) Relative permeance model

Figure 6: Error distribution changing with ratio of tooth (Vernier PMSM)

From these figures, we can find the relationship between the median error and error distribution with the key parameters in the different analytical models. The median error become bigger, the error distribution become more divergent. It means the precision of the analytical model become instable. We should try to avoid this situation, when we use the analytical model in the initial step.