

12R020 - GREAT GRAPHS MAKE EXCELLENT PAPERS 28-NAR-12

Aim - to discuss the importance of graphs in research papers, and the selection of the appropriate type of graph

1. GRAPHS

Behind every excellent research paper is some really good graphs!

The graphs in a paper should demonstrate the flow of argument of the paper. Every paper has one or two key graphs which capture the essence of the results.

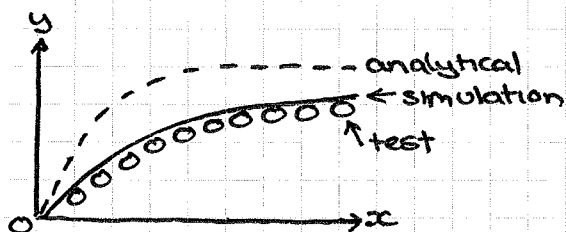
Good graphs provide useful insights and demonstrate results clearly.

They should show meaningful parameters which are important, e.g. efficiency, loss, power, current etc. The use of normalised parameters (dimensionless) can sometimes give greater physical understanding. See PEBN # 11 on parametric analysis for more details (available from website at top of page).

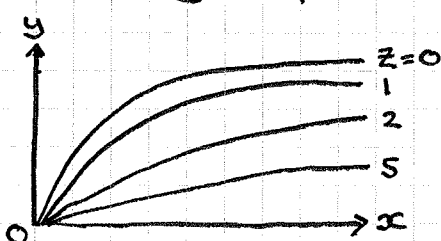
2. EXAMPLE GRAPH TYPES

2.1. Line Graphs

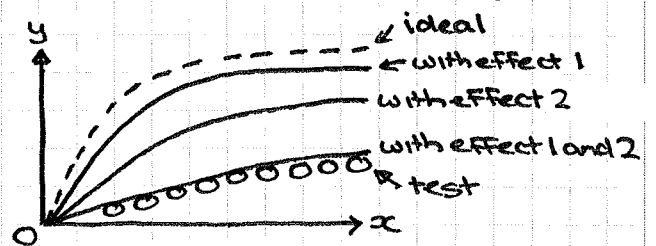
Correlation between analytical, simulation and experimental results



Sensitivity to a parameter, z :



Effect of including two 2nd order effects into an idealised model:

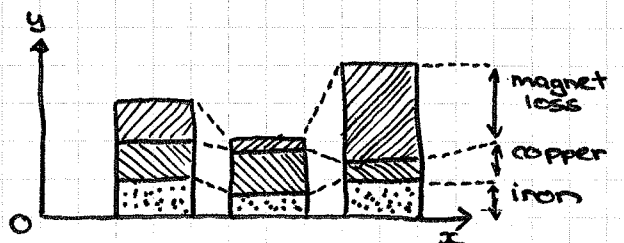


2.2. Bar graphs

Comparisons:

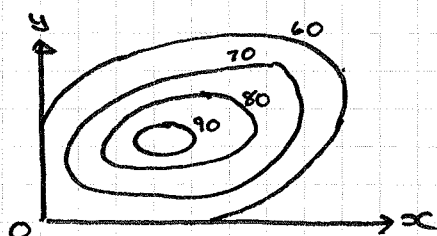


Component comparisons:

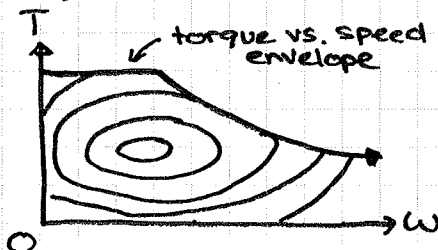


2.3. Contour Plots

Effect of two variables on a parameter:

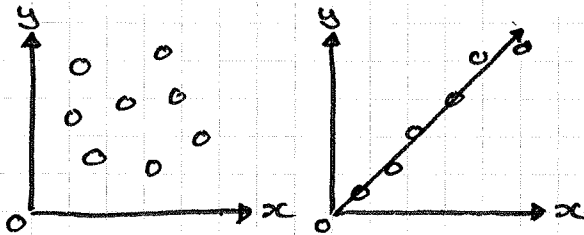


Torque versus speed efficiency maps:

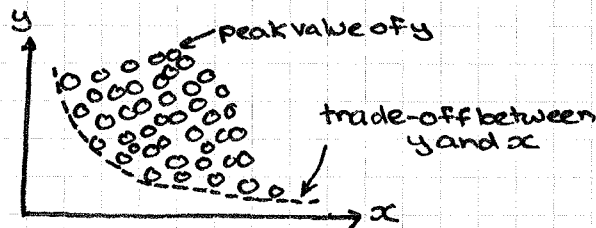


2.4. Scatter Plots

Demonstrate correlation (or lack of) between variables:



Show results from a Monte Carlo optimization:



2.5. 3D Plots

These can look very attractive and are great for visualising contour plots, but in general are harder to read values from compared to 2D contour plots.