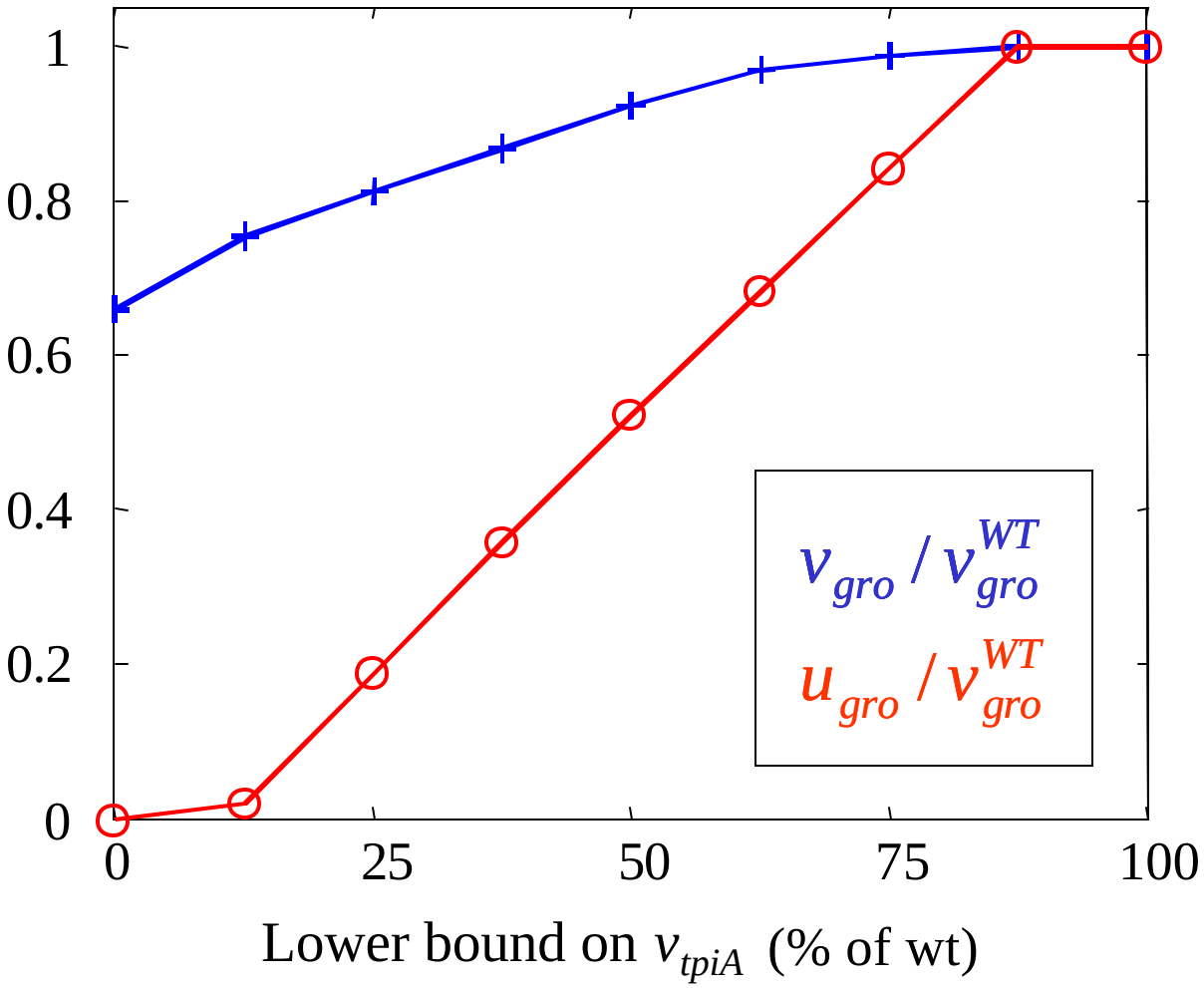
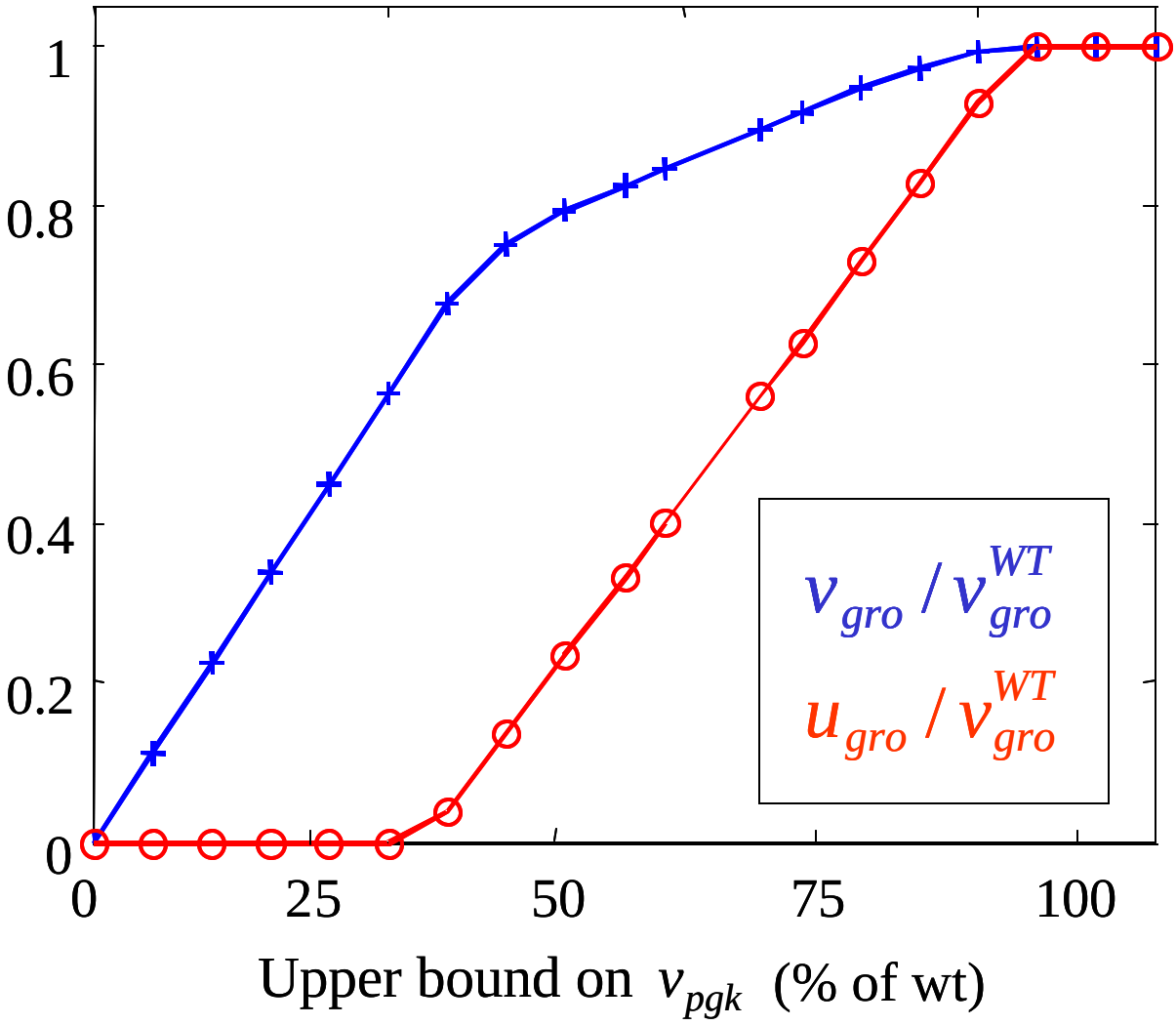
Robustness of FBA and MOMA with respect to partial deletions

This analysis is analogous to the one previously performed for FBA. Rather than deleting a gene completely, it is possible to gradually limit its flux with an increasingly stringent constraint. In this way the constrained flux (x axis) will vary from zero (0%) to the wild type value (100%). The corresponding growth rate, normalized to the wild type growth rate, is shown here for FBA (blue, optimal) and MOMA (red, suboptimal) solutions.
The first figure (A) is for gene tpiA, which is predicted to be lethal by MOMA, but not by FBA. The second figure (B) refers to gene pgk, where both MOMA and FBA predict lethality for complete knockout. Interestingly, in this case, the extreme cases of wild type and complete knockout are predicted equally by the two methods, whereas intermediate constraints give discrepancies.

A



B


1
0.8
0.6
0.4
0.2
0
0
25
50
75
100
v_{gro} / v_{gro}^{WT}
u_{gro} / v_{gro}^{WT}
Upper bound on v_{pgk} (% of wt)