Tune calculation

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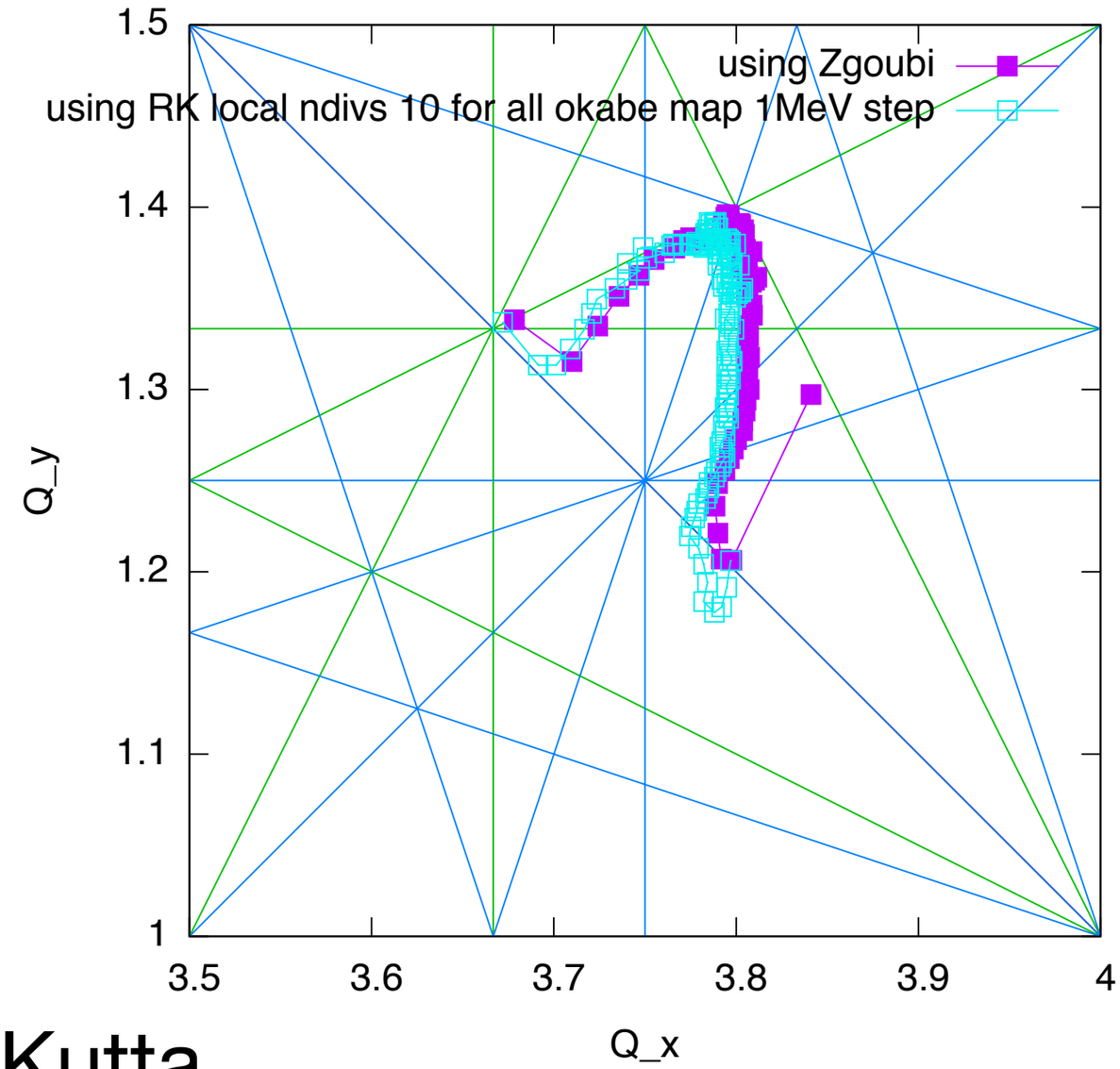
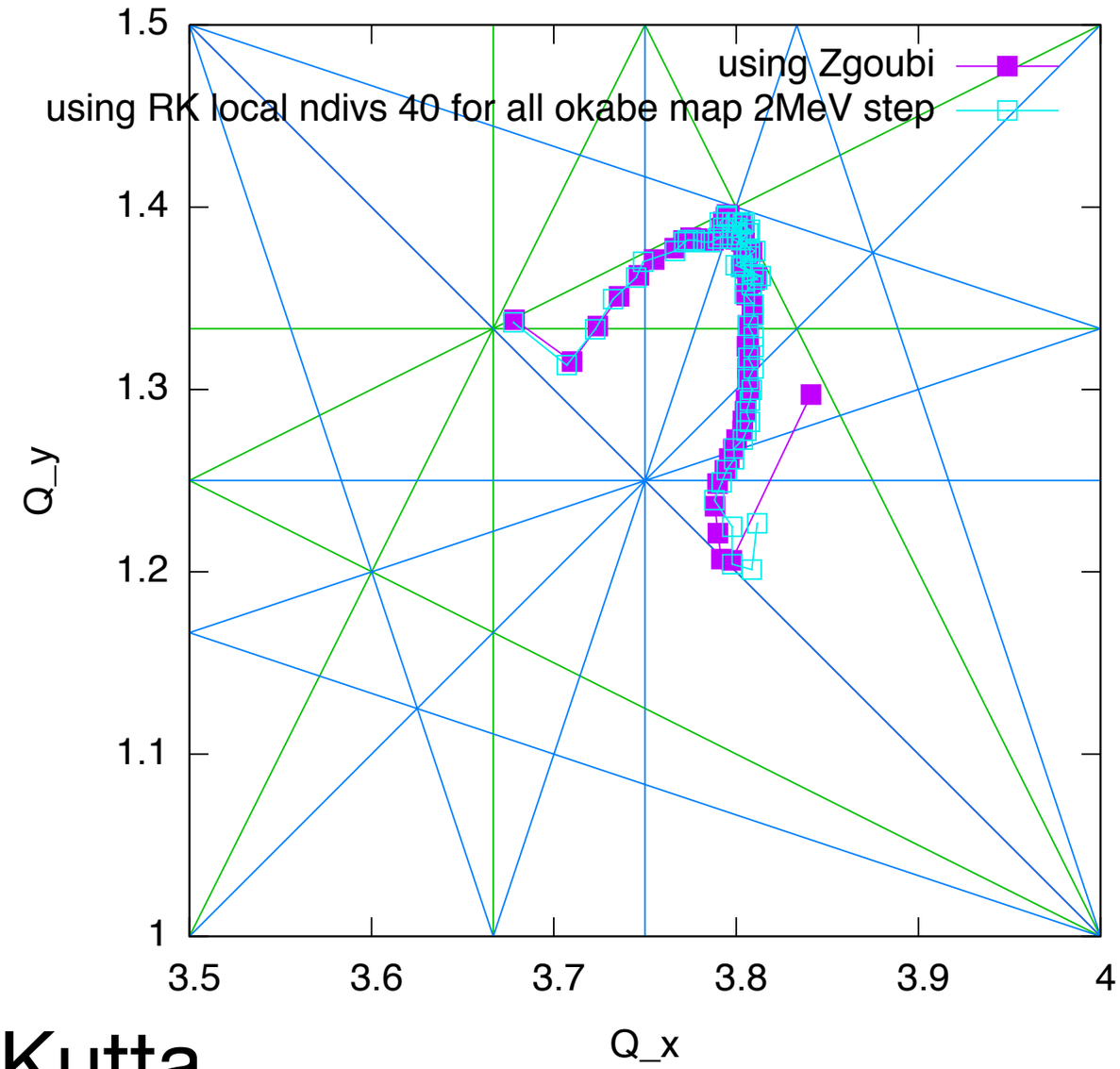


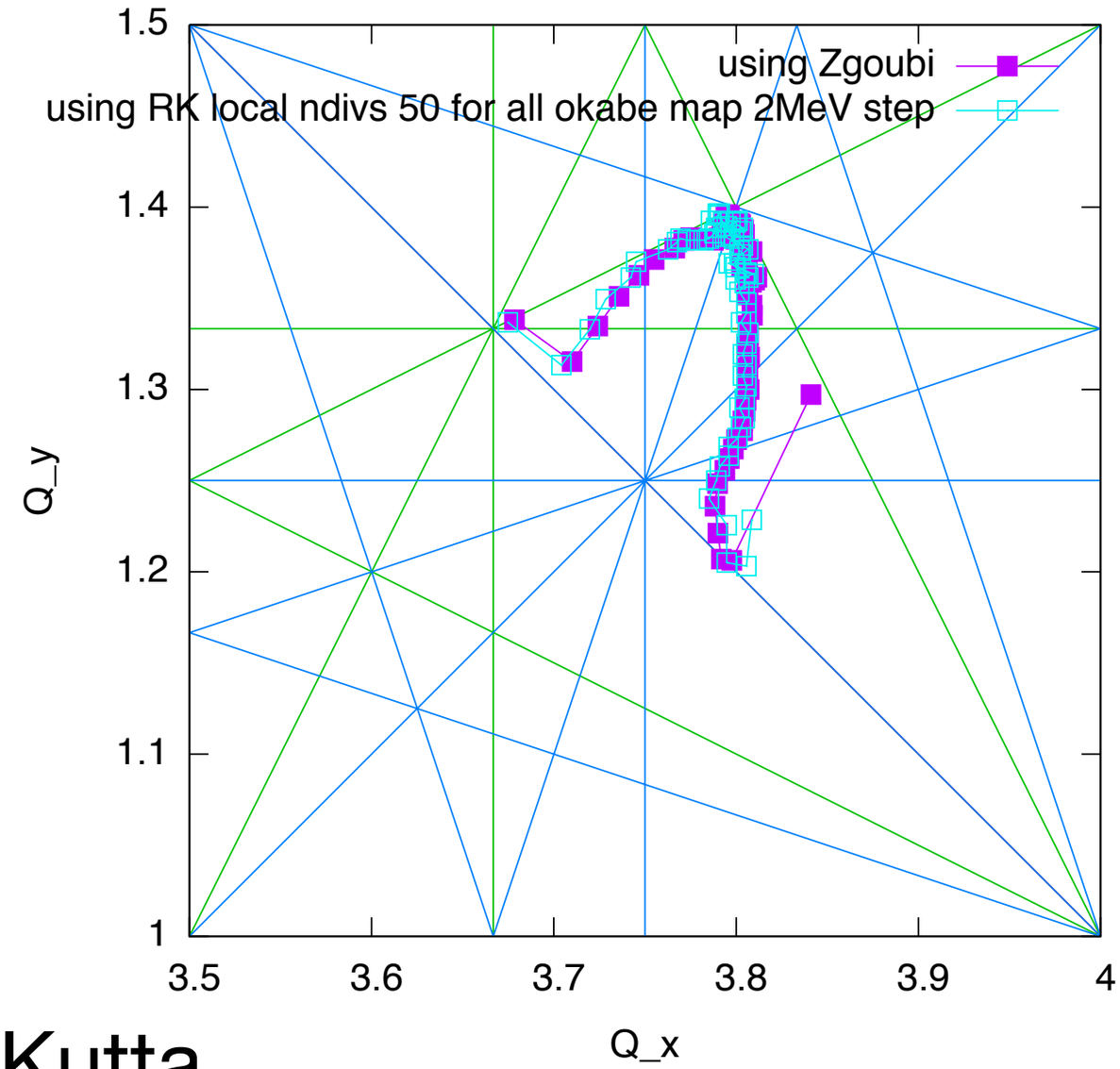
simulation condition

1. solver : 4-th order Runge-Kutta
2. step size: 960 segments per turn
   smaller for the region in which B varies rapidly
3. initial amplitude x=1mm, x'=0, y=1mm, y'=0
4. number of turns : 1024
5. tracking scheme : local tracking w.r.t. the closed orbit



simulation condition

1. solver : 4-th order Runge-Kutta
2. step size: 3840 segments per turn
   smaller for the region in which B varies rapidly
3. initial amplitude x=1mm, x'=0, y=1mm, y'=0
4. number of turns : 1024
5. tracking scheme : local tracking w.r.t. the closed orbit



simulation condition

1. solver : 4-th order Runge-Kutta
2. step size: 4800 segments per turn
   smaller for the region in which B varies rapidly
3. initial amplitude x=1mm, x’=0, y=1mm, y’=0
4. number of turns : 1024
5. tracking scheme : local tracking w.r.t. the closed orbit

summary

1. Betatron tunes have been calculated using 4th order R-K.
2. The pattern of tune variation within acceleration tends to Malek's result using ZGOUBI.