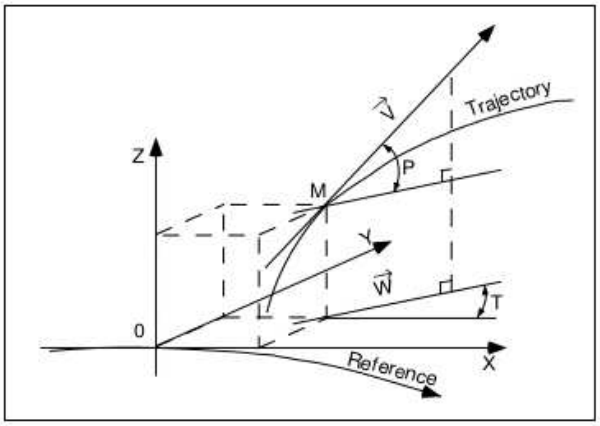
M. Haj Tahar

Output from "KURRI FFAG" data treatment

1 TOSCA map "TOSCA map f810 d1020.dat"

This section shows the amplitude depending tune spread of the KURRI 150 MeV FFAG. Initial coordinates for the tune calculation are varied (different sampling) in order to check the convergence of the results obtained with zgoubi. These results are compared to the ones obtained from EARLIETIMES. This study is a first step to the benchmarking of both codes, EARLIETIMES and ZGOUBI.
The four coordinates (Y, T, Z, P) as defined in zgoubi were varied:



Reference frame and coordinates (Y, T, Z, P) in zgoubi.
OX : in the direction of motion,
OY : normal to OX,
OZ : orthogonal to the (X, Y) plane,
$\vec{W}$: projection of the velocity, $\vec{v}$, in the (X, Y) plane,
T = angle between $\vec{W}$ and the X-axis,
P = angle between $\vec{W}$ and $\vec{v}$.

The differences are comparable to the amplitude depending tune spread (see graphs below). For small variations with respect to the closed orbits, we observe that the tune calculation is converging. Both codes, EARLIETIMES and ZGOUBI, agree with less than 2% difference in both planes. Yet this has to be investigated more in detail to determine the origin of the discrepancy.

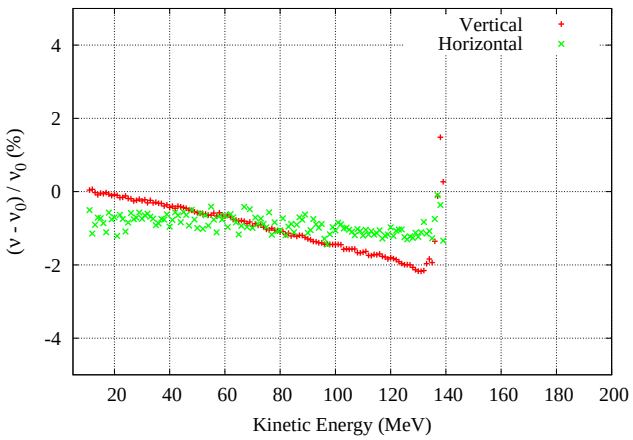
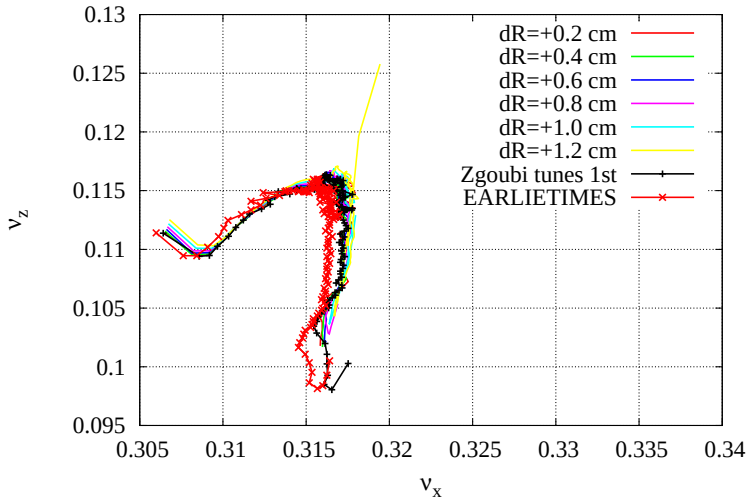
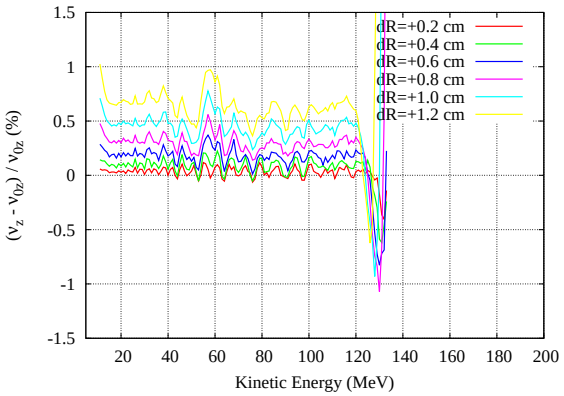


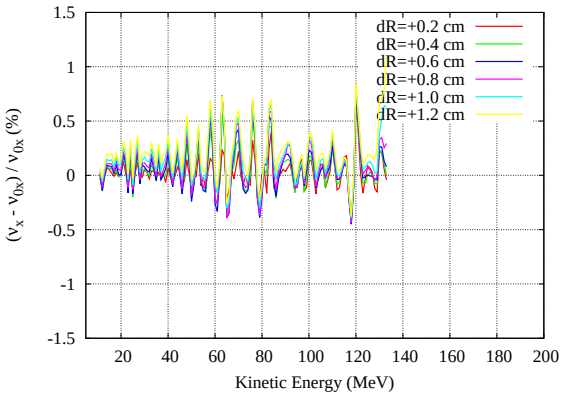
Figure 1: Tune difference between the two tracking codes EARLIETIMES and ZGOUBI.



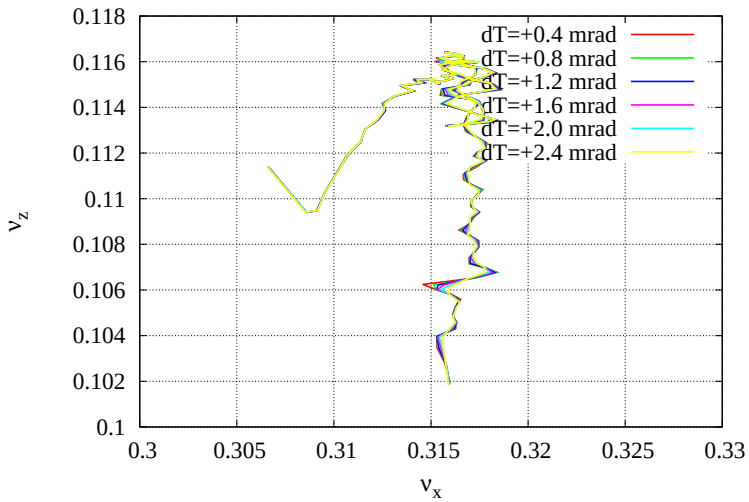
((a)) Tune diagram.



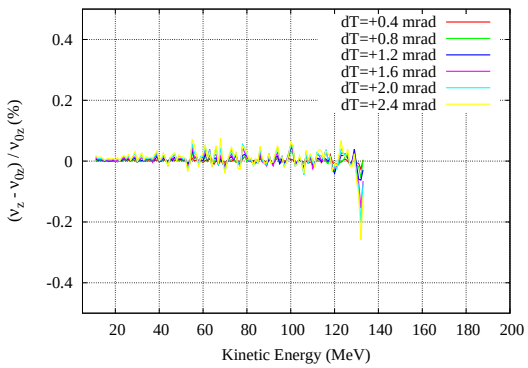
((b)) Vertical tune variations with the radius.



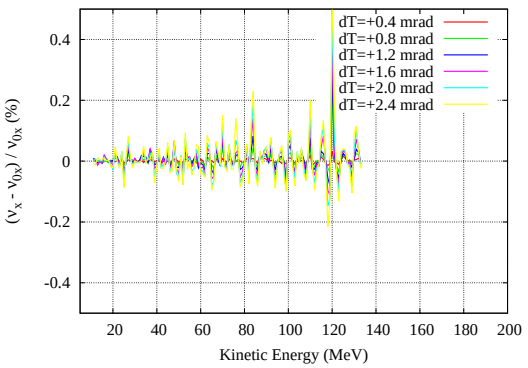
((c)) Horizontal tune variations with the radius.

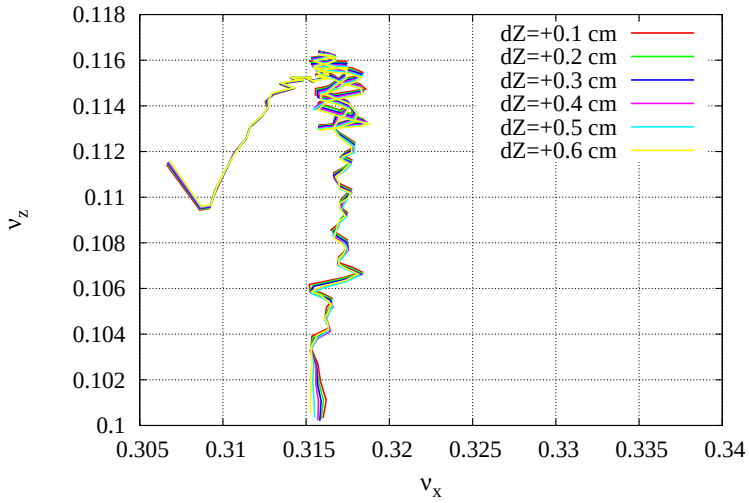


((d)) Tune diagram

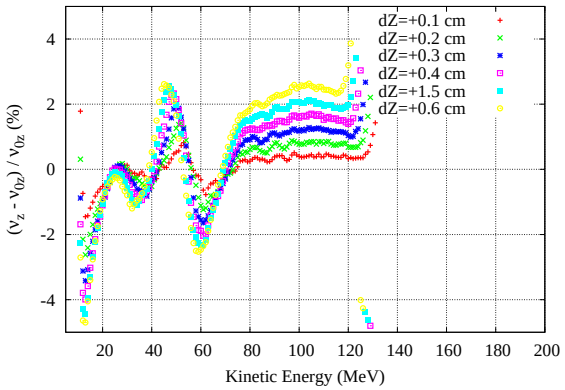


((e)) Vertical tune variations with the angle T 2((f)) Horizontal tune variations with the angle T

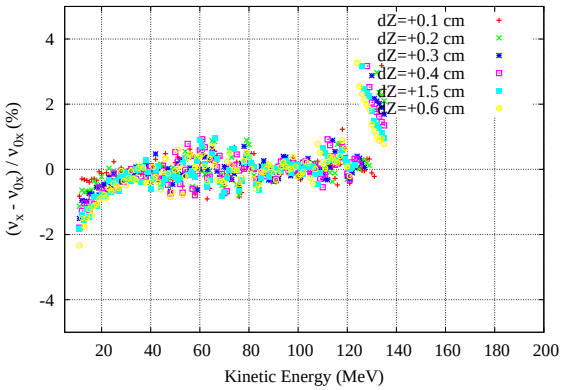




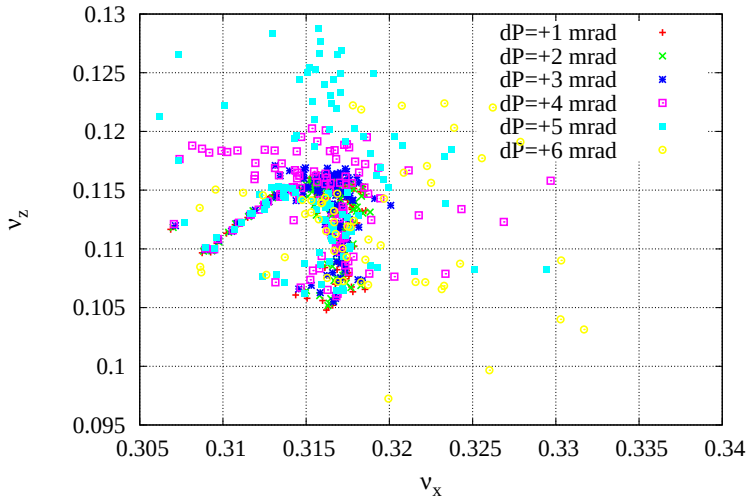
((a)) Tune diagram



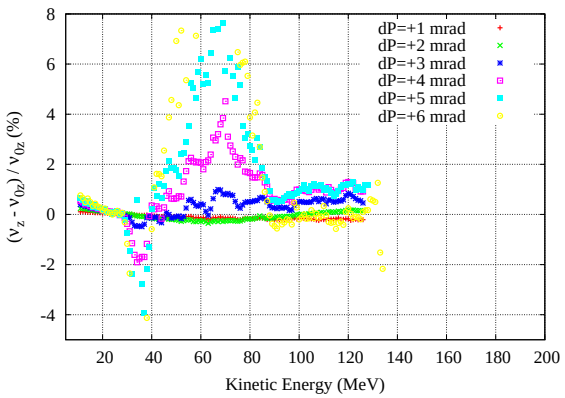
((b)) Vertical tune variations with Z



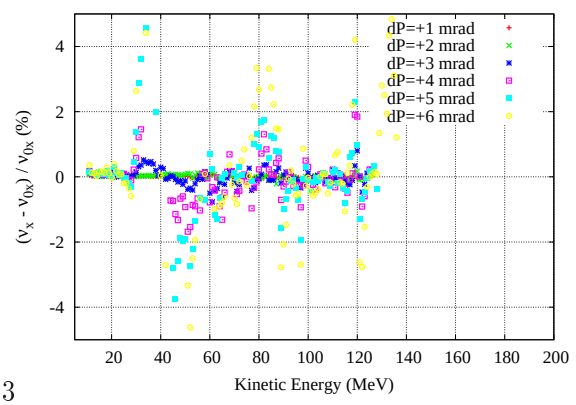
((c)) Horizontal tune variations with Z



((d)) Tune diagram



((e)) Vertical tune variations with P



((f)) Horizontal tune variations with P