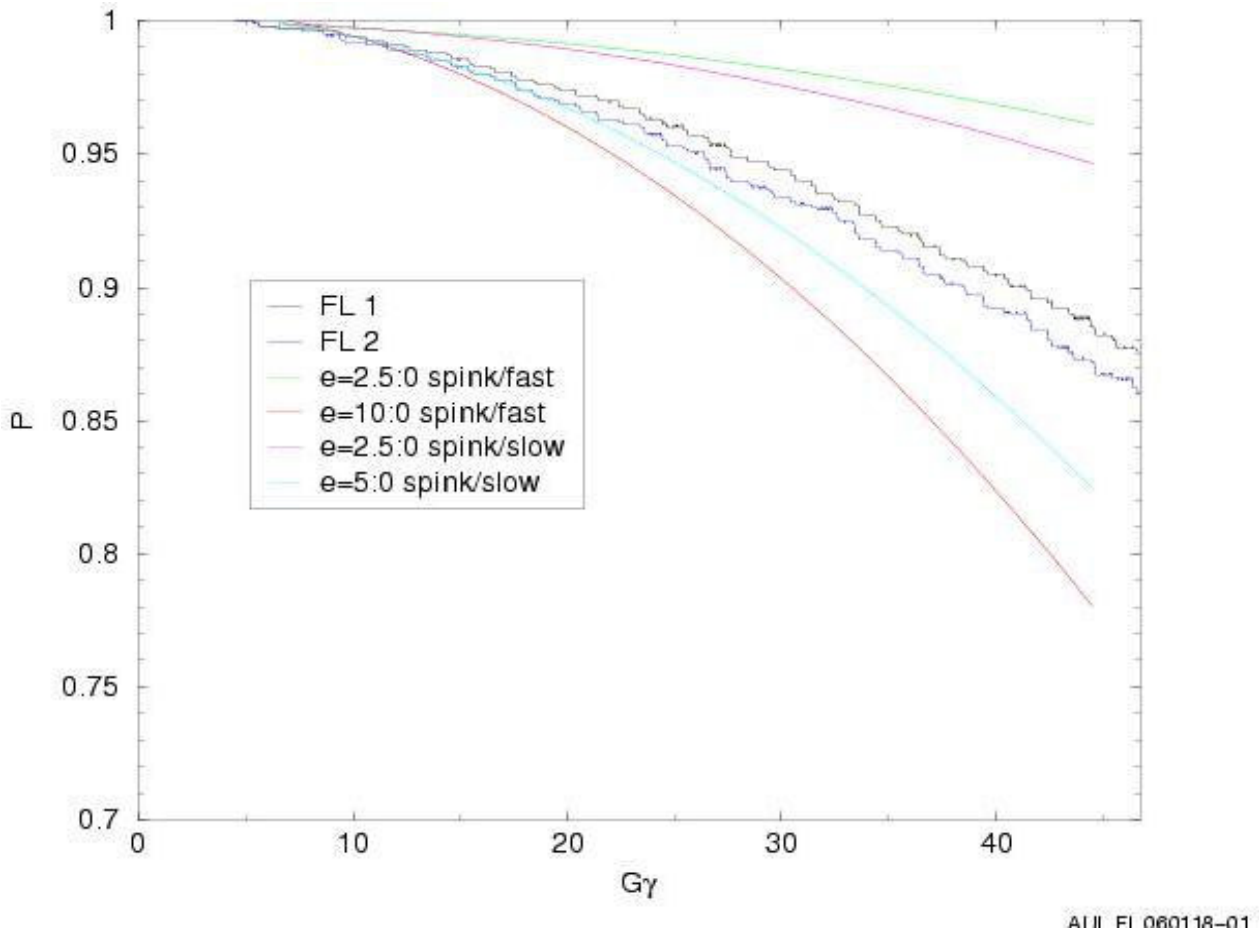
Study of the AGS horizontal resonance I

The jagged curves have been calculated by Fanglei using a simple tracking program. They represent the projection of the spin on the n_0 axis vs. energy. The curves show a parabolic loss of polarization, in agreement with the theory.

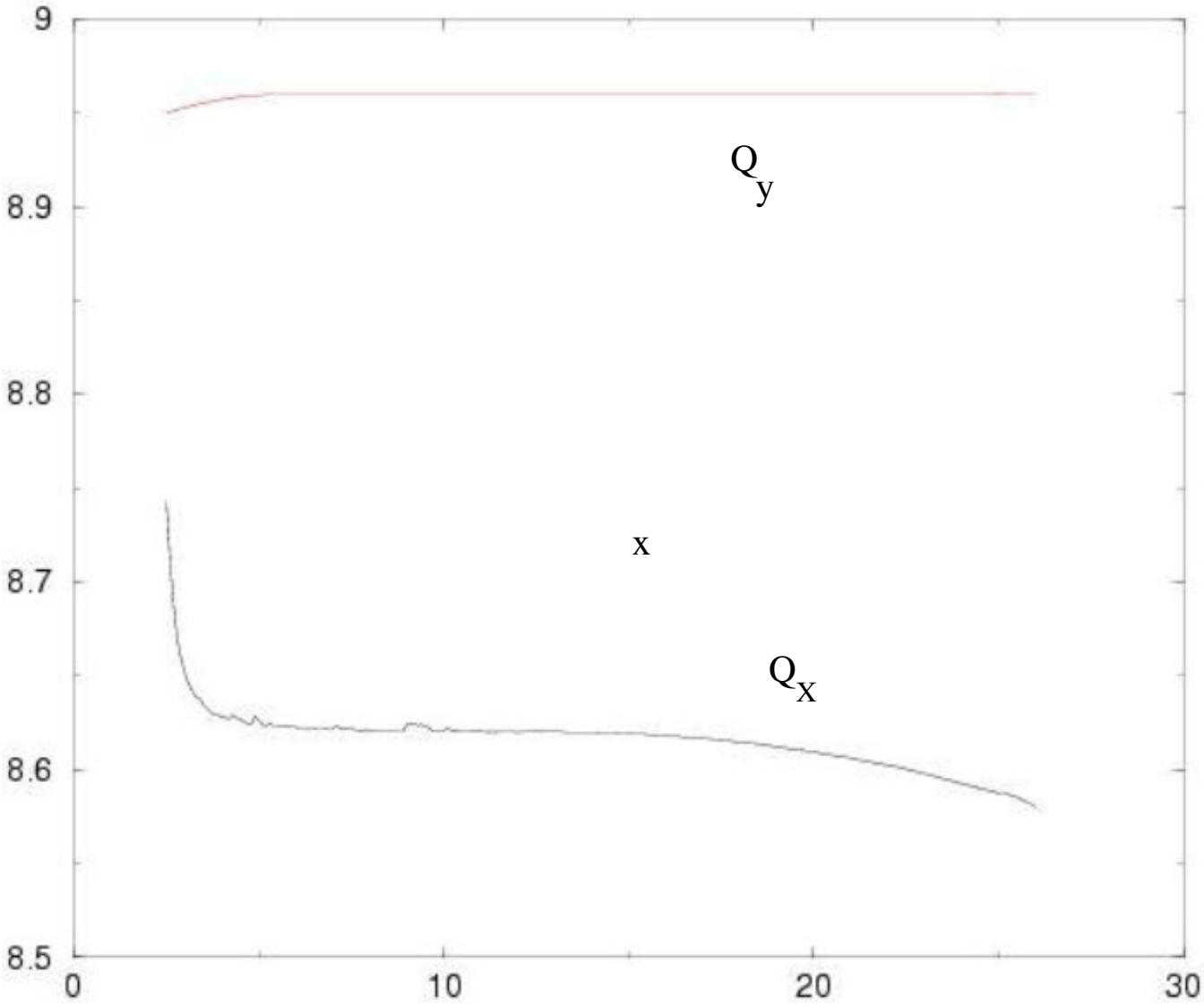
The other curves are a fit of the statistical σ of the vertical component of the spin after tracking with Spink of one particle. The vertical emittance is always zero

Fast: means AGS ramp of $\delta\gamma = 30.6^{-5}$/turn,
Slow: means = 16 10^{-5}/turn



Study of the AGS Horizontal Resonance II

betatron tune
path for the exercise
shown in the next figures



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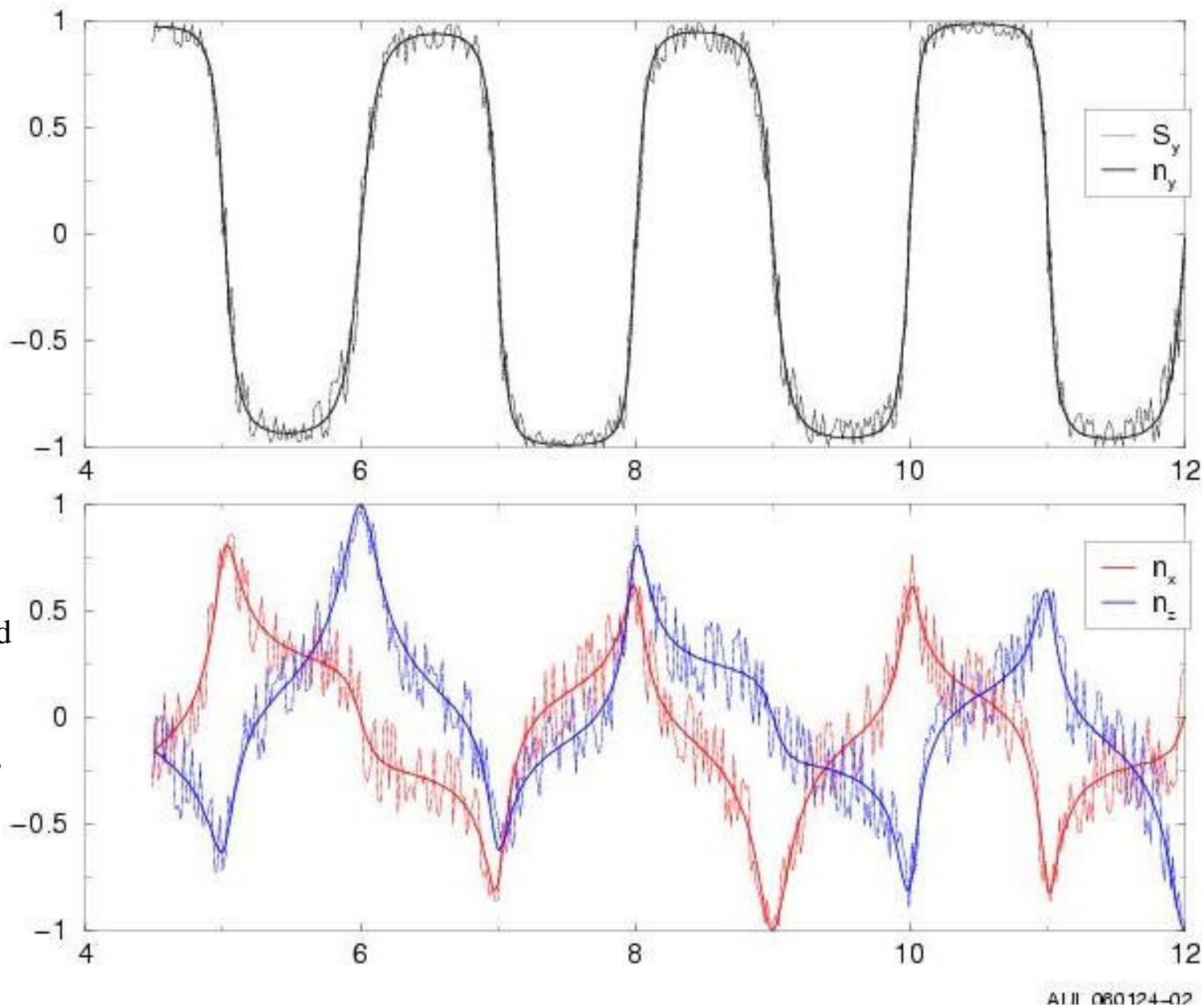
Study of the AGS Horizontal resonance III

Spin tracking of one particles. The three components of the spin (started vertical) against the stable axis n_0

The horizontal axis is Gγ.

The starting value of the spin for tracking with Spink was 0:1:0

The stable axis was found at each turn from the One-Turn spin matrix. Its value with two snakes is -0.15:0.975:-015



Study of the AGS Horizontal resonance IV

The upper curve is the vertical component of the stable axis.

The lower curve is the projection of the spin on the stable axis

$$\vec{S}.\vec{n}$$

and its fit with a polynomial. The parabolic behavior is there.

We have shown three ways to calculate the depolarization due to the horizontal motion