

# Skew Quadrupole Modulation Beam Experiment

( Jan. 27-28 session )

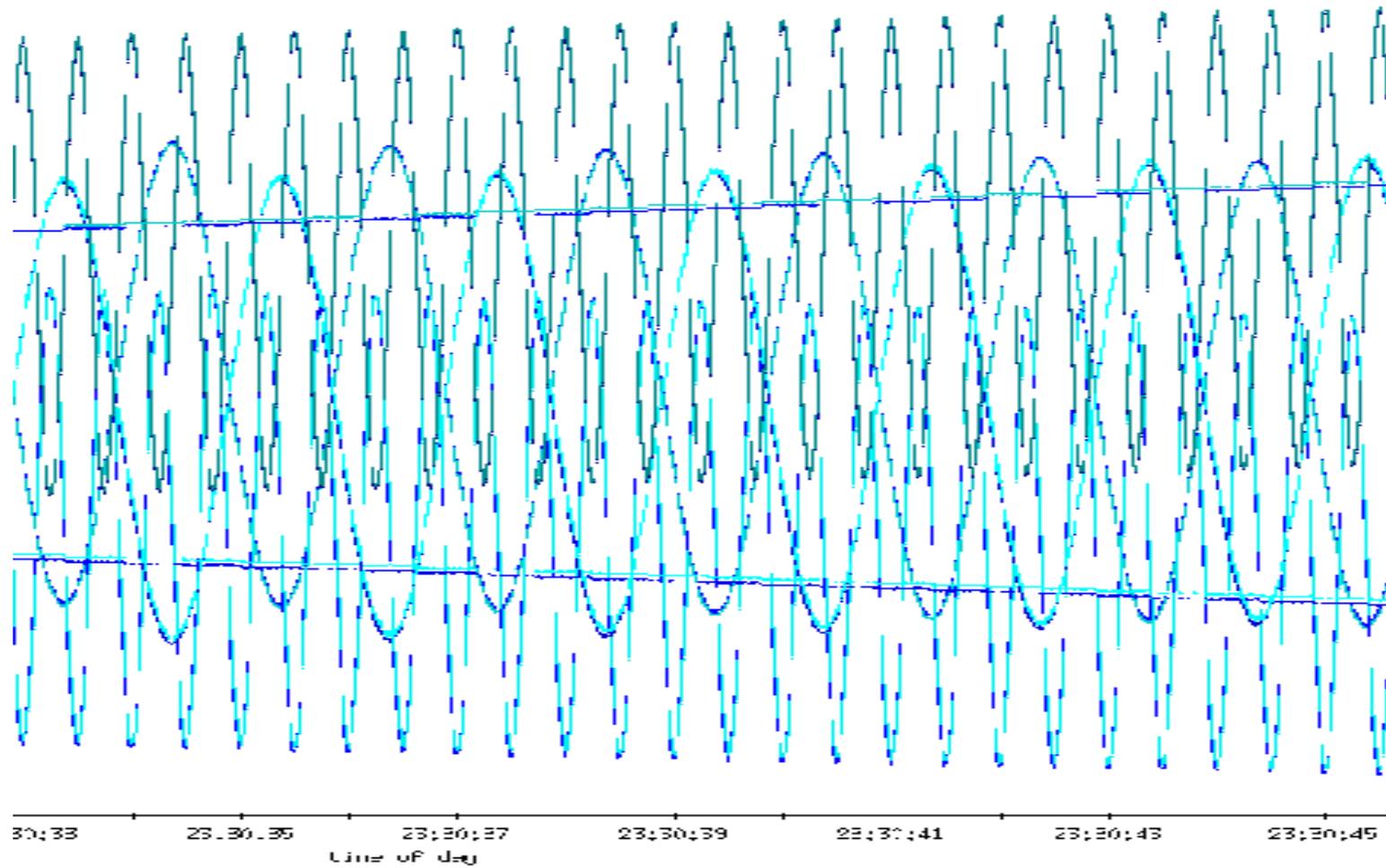
## What new features about the experiment

- 1) modulating on RHIC ramp
- 2) modulating two families at same time  
modulation frequencies: 0.5Hz, 2.0Hz

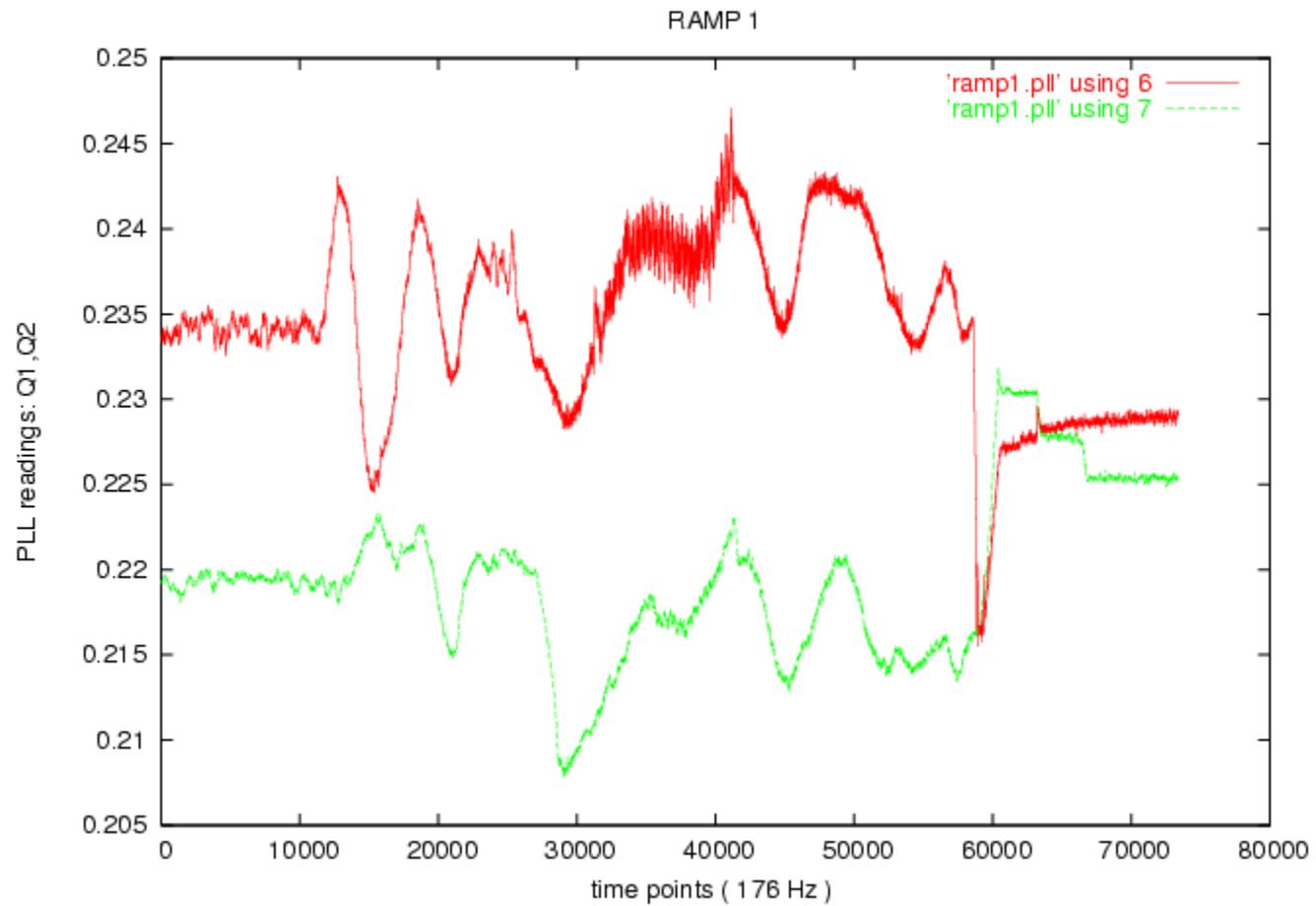
## What data we got

- 1) first ramp :  
F1: 3A, 0.5Hz    F2: 3A, 2.0Hz  
from t110 to t170, lasting 60sec.
- 2) second ramp:  
F1: 2A, 0.5Hz    F2: 2A, 2.0Hz  
from t110, lasting 200 sec.

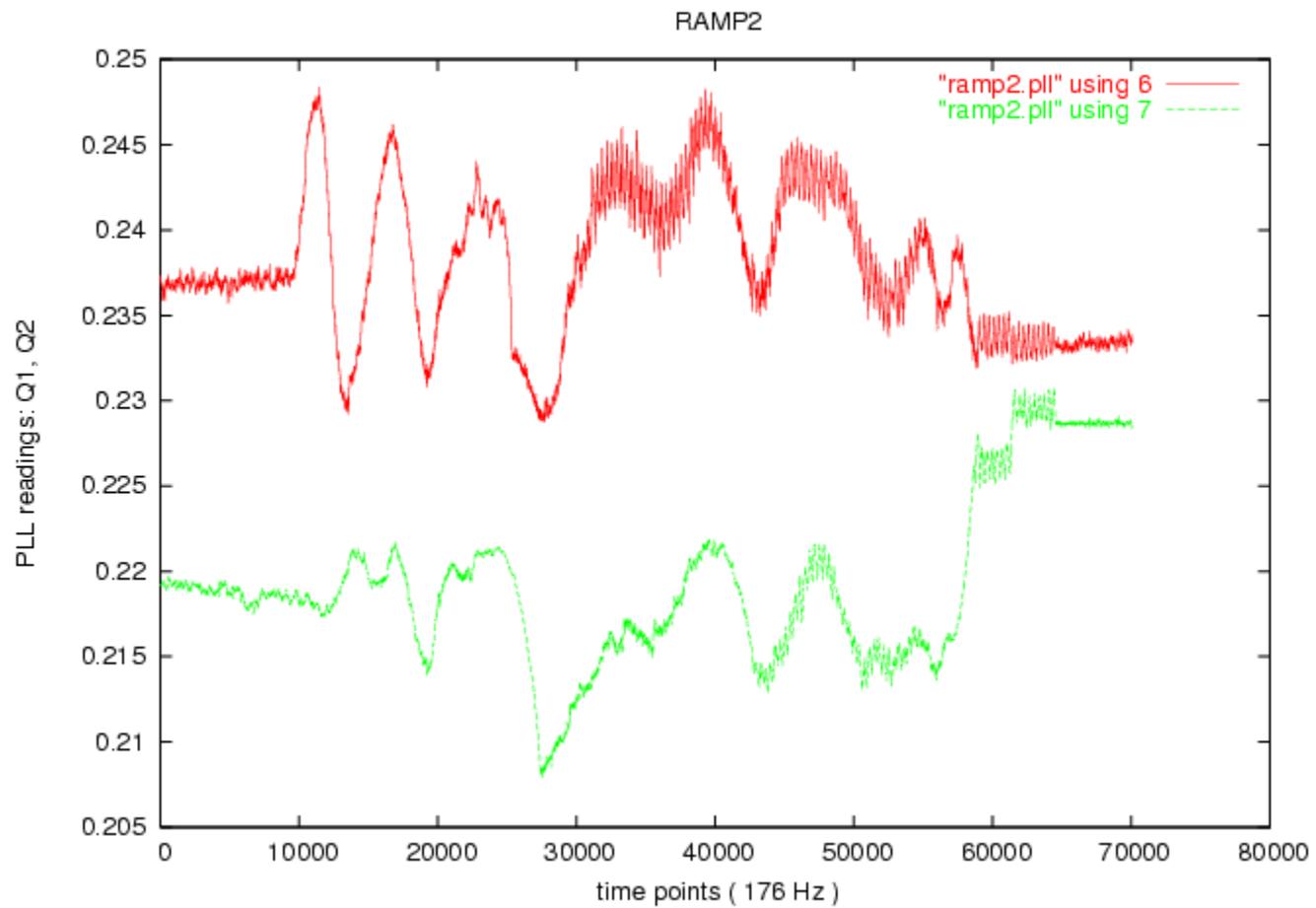
## Skew Quadrupole power supplies' currents



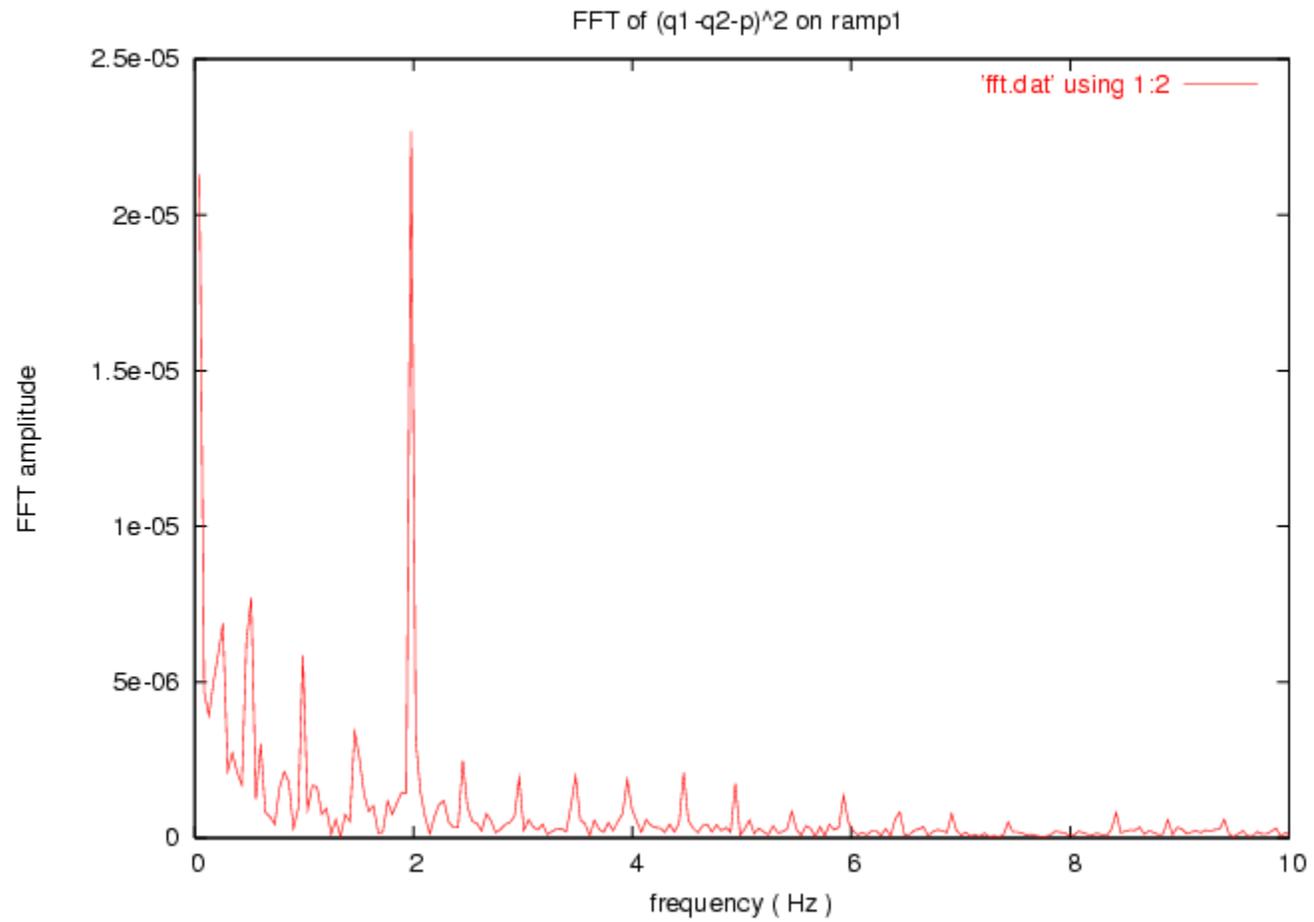
## PLL Readings ( ramp 1 )



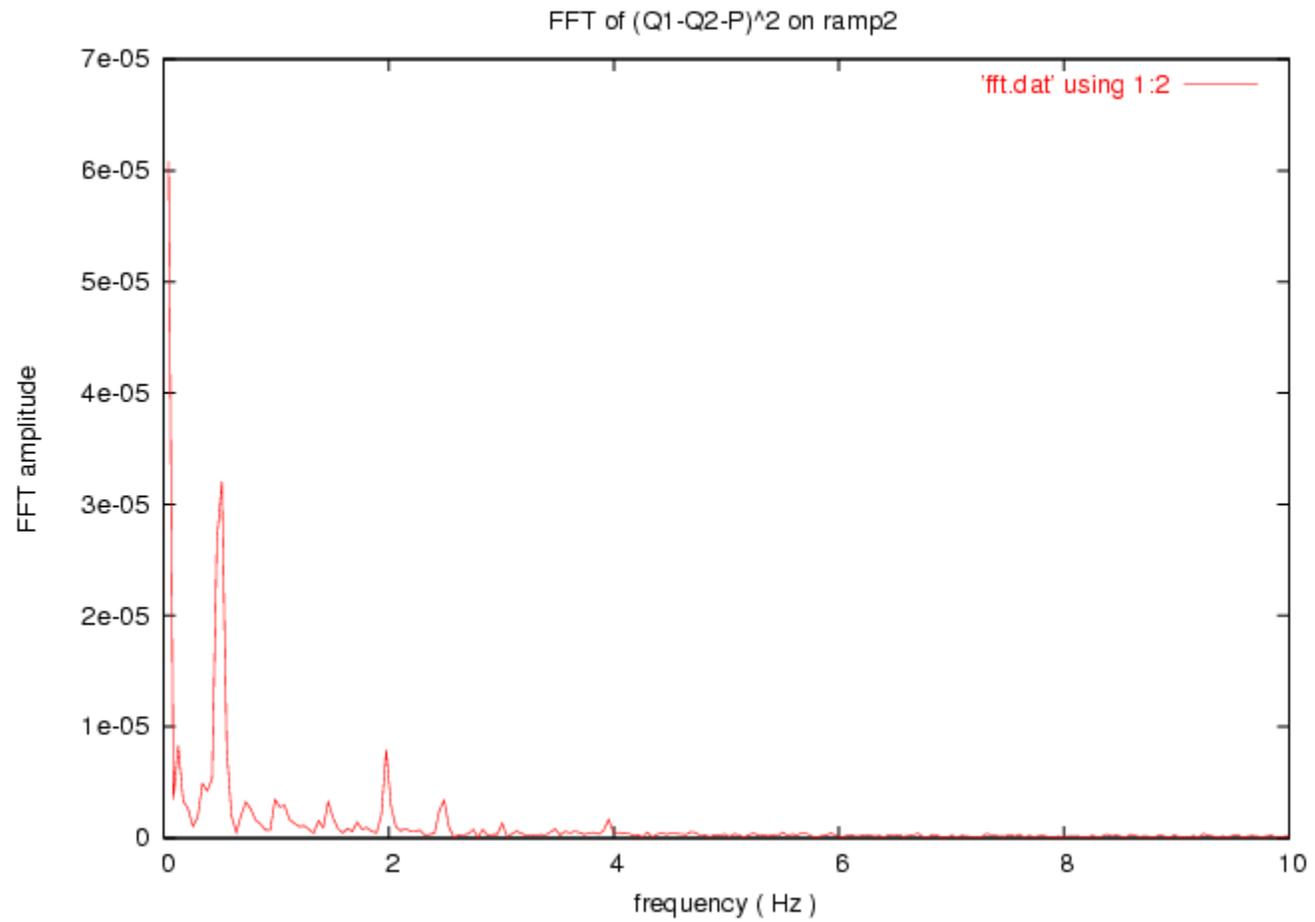
## PLL Readings ( ramp 2)



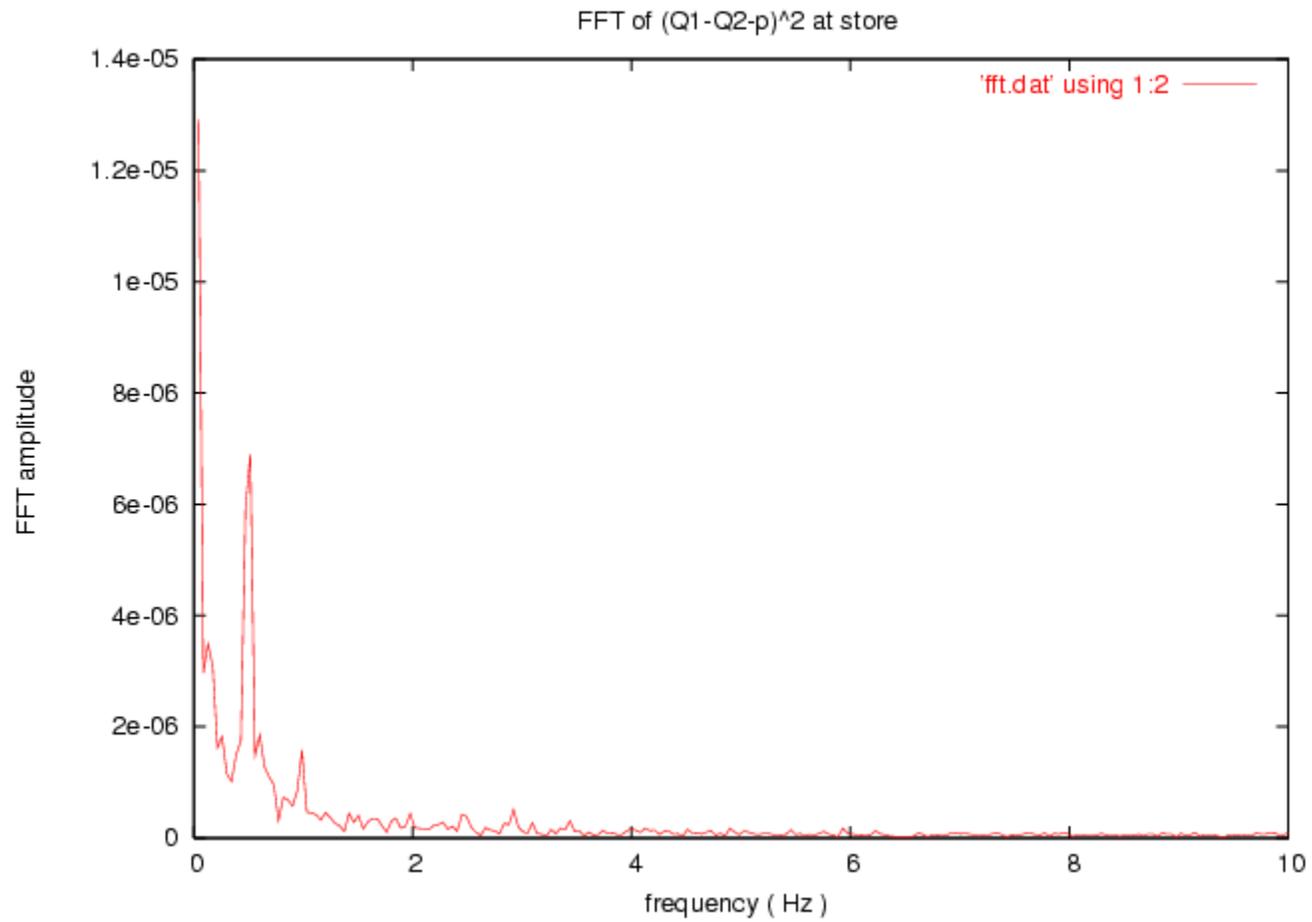
## FFT of $(Q1-Q2-p)^2$ for Ramp 1:



## FFT of $(Q1-Q2-p)^2$ for Ramp 2:



## FFT of $(Q1-Q2-p)^2$ at store for the second filling:



## Conclusion for this session

- 1) We really saw the modulations of the eigentunes, however modulation in one plane was much larger than that in other plane. To be checked with PLL experts.
- 2) On ramp, the energy changes, so constant modulation means decreasing of the modulation strength along the ramp; and the working points changes on ramp, so the lattice changes. Both need careful evaluation off-line.
- 3) There are many peaks whose frequencies are multiples of the smaller modulation frequency 0.5Hz. Another modulation frequency is 2.0Hz. It seems that the two frequencies coupled with each other. Simulation will be done to check the effect.
- 4) The data taken basically couldn't be used for the betatron coupling information extraction since there are no wanted peaks or many peaks.

## **Work in the following**

- 1) to check different modulation frequencies
- 2) to check two families modulation at same time

basically do with simulation code, also can be done with real beam

### **3) accumulate more data from beam experiments**

### **4) on-line application script writing ( crucial ! ).**

To speed up the data analysis, to fasten the decision making during experiments, to correct the coupling after coupling measurement.