Spin meeting minute, 2/1/2006

This meeting is mainly focus on horizontal resonances. Thomas proposed to study the possibility of pushing horizontal tune also close to an integer to overcome horizontal resonances by the two snakes. Given the constraint of quads and power supplies, it is less difficult to put horizontal tune close to 8 than close to 9. Alfredo did MAD calculation for such a lattice with two snake included but no compensation quads. Such a lattice can be achieved from MAD point of view, but the current required after 10GeV exceeds the limit, which means horizontal tune has to be adjusted by other ways. Thomas suggested to max out the horizontal quad current and move beam radius to the outside. Vladimir commented that the two tunes have to avoid sum resonances. That is doable since horizontal tune does not need to be as close to integer as the vertical one. Thomas suggested to try a spin tracking with such a lattice to see if the lattice eliminates the polarization loss due to horizontal resonances. Change some vertical quads or γ_t quads to horizontal quads is not an option since they are needed for other species in the AGS. Moving some polarized proton quads (vertical) is possible but it is a significant work inside the ring. Yousef and Mei suggested tune jump, as the horizontal resonance strength is very weak, the requirement of the jump amplitude and speed can be relaxed. Vladimir further suggested to use tune modulation through out the ramp. In both cases, it is hard to keep vertical tune from moving away. Tuning of each of them could be as tedious as the harmonic correction scheme in the late 80's. Moreover, the effect from each single one is so small that it is not possible to tune them individually by monitoring the polarization change.

Fanglei used Thomas' simple model to analyze the horizontal polarization profile we just measured a few days ago. By adjusting the initial polarization, average resonance strength, she can match the profile shape. But the resonance strength has to be stronger than what we estimated in the past and the initial polarization has to be lower than injection polarization measured. If there is additional polarization loss from other sources or something else remains a question.

Haixin