

Minutes of spin meeting 05/23/07

Fanglei first presented her continued work on spin tracking around $G\gamma = 5$. In general, the resonance strength extracted from spin tracking is stronger than the one calculated from DEPOL. Since DEPOL treats snakes as drift space, it does not give a complete picture.

There is an interest to use phase advance of 90° instead of 82° in RHIC so that higher order resonance effects at store can be reduced. Such a lattice would have higher transition energy and the RHIC injection energy has to be raised for this lattice. According to Waldo's calculation, the spin transfer efficiency at $G\gamma = 48.5$ (or 48.7) is about as good as $G\gamma = 45.5$. After raising the AGS flattop energy, the crossing speed over $36 + \nu$ would be faster. There is no intuitive model about the acceleration rate on the final polarization, as Froissart-Stora formula does not apply for snake resonances. Fanglei did spin tracking for two different crossing speeds. Several snake resonance tunes (higher orders) were used in the tracking. The results show that the 2.5 times faster acceleration rate marginally give higher polarization (higher by 0.5%) for tunes close to 8.98, but faster acceleration rate results in more polarization loss for lower vertical tune cases. Mei commented that the beam experiment done in RHIC shows no simple correlation between acceleration rate and polarization loss for snake resonances. Thomas commented that in principle, polarization loss is due to non-adiabatic conditions. In this case, the question is if the spin vector cone opening and closing adiabatically. This spin tracking is interesting to continue to explore this effect, but the bottom line is that there seems no harm to beam polarization in the AGS if raising AGS extraction energy.

The discussion continued on AGS proton setup. Thomas suggests to count all possible polarization loss from Booster and AGS to see if we still have unaccounted loss. Fanglei will check the polarization due to horizontal resonances. During the remaining weeks, we have the following jobs need to be done: horizontal profile measurements with both high Q_x and low Q_x ; explore vertical tune around $G\gamma = 5$; raise intensity for 14% cold snake lattice; polarization ramp measurement; probably $G\gamma = 48.5$. Kevin reminded us that the emittance may not be well tuned yet and could play a role in the polarization loss. On the short coherence we have around $0 + \nu$, Woody and Kevin suggested to play with octupoles.

Haixin