Spin meeting minutes, 1/10/2007

Fanglei extracted emittance from the horizontal beam profiles taken during the polarization profile measurements. She took into account the contribution from $\Delta p/p$ and non-zero dispersion. The analysis gave 1.8$\pi\mu$m rms for 10% cold snake case, and 1.5$\pi\mu$m rms for 15% cold snake case, both are smaller than what she used before: 2.5$\pi\mu$m rms. The average horizontal resonance strength extracted from the polarization profile measurements and the theoretical model agree within 20%. Leif pointed out that the momentum spread extracted from May 17 data is twice as big as what Fanglei currently used, which could further reduce the actual emittance and potentially improve the agreement. The analysis is still going on. So far the errorbar of the resonance strength is from the statistical errors of polarization measurements only. There are others from the beam profile measurements, lattice function, bunch profile fittings and so on. Some of them are systematic errors and are hard to quantify.

Thomas asked if we have horizontal ORM data to give β_x at CNI polarimeter. Leif answered that we do have data but they have not been analyzed yet. Mei then showed her analysis of extraction energy vertical ORM data. The phase advance data showed 18th harmonic oscillation. Thomas commented that the 18th harmonics interfering with 12 superperiod could give the 6-fold symmetry seen in ORM data. In Mei's version of ORM analysis, it only gives the ratio of beta functions at BPMs and correctors. A known beta function in the lattice is needed to "scale" them to real beta functions. Todd's version includes iteration to deal with beta function "calibration". It can also handle nonlinearity, which is necessary for the AGS (helical magnets, sextupoles,...). Thomas commented that we need these information urgently since if the 18th harmonics are so strong, we could not put both tunes close to 9 as we planned for next run. We need to find the source and fix the 18th harmonics. Thomas and Dejan also suggested to model the AGS with the 18th harmonics included, to see if the phase information could reveal the offending quad(s). The discussion continues on modeling. Kevin stated that the MAD model does not predict well chromaticity even for bare AGS (combined function dipoles only). Woody commented that this is due to the poor modeling of end effect of these dipoles in MAD. Dejan suggested to add thin sextupoles to quantify the effect.

Haixin