BDS lattice design meeting
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The necessary changes to the RDR lattice and possibilities to shorten the BDS for both RDR design and for the central region integration with a dogleg after the undulator were discussed. These studies need to be completed by September-October'09. We agreed that the first design thoughts to be presented to BDS/MDI group during the TILC09 meeting in Tsukuba, 17-21st April'09.

1. Discussion about providing separate functionalities of upstream polarimetry, MPS collimator and laser wire detector:
   - If emittance budget is allowed to increase, how short the polarimeter chicane can be designed?
   - Location of polarimeter chicane – before or after the tuning beam line/dump?
   - Beam parallel to the IP after the dogleg?
   - Location of Emittance, and Energy diagnostics (for fast extraction) and fast extraction.
   - There will be skew correction, emittance measurement, energy detection and fast extraction in the Linac. Do we need skew correction in the BDS (probably yes).
   - The possibility of including the skew correction and emittance measurement before fast extraction just before undulator was not favoured by the BDS/MDI group during the discussions at LCWS08, so on the electron side it should be provided after the dogleg.
   - To protect the small aperture of the undulator, sacrificial collimators and fast extraction will be required before the undulator. This will reduce the energy acceptance in the tuning line of the BDS and fast extraction may not be required in the BDS, DC magnets can be used to send the beam to the tuning dump line.

2. A bullet point layout was discussed and it was agreed to make it in the following order:

   - Fast extraction (before und) (may have small chicane)
   - Undulator
   - Dogleg
   - Long drift through positron target shielding (without any components)
   - Matching to beam diagnostics optics
   - Skew corrections (is it enough to have this in Linac?)
   - Emittance diagnostics
   - Laser wire detection (with energy chicane to separate photons)
   - Tune-up extraction dump (may be DC magnets)
   - Polarimetry on tune up beam dump or after? (check with polarimeter people).
   - Matching sections as required.
   - To be followed by Betatron collimation, Energy collimation, FFS

Positron side, discussed two possibilities :

I. drop up to matching to beam diagnostics
- Fast extraction with tune up like RDR (including sacrificial collimators)
- Duplicate the chicane : for energy detection and for polarimeter chicane

II. Fast extraction just at the exit of positron Linac :
- Matching to beam diagnostics
- including sacrificial collimators
- Skew corrections (?)
- Emittance diagnostics
- Laser wire detection: with energy chicane to separate photons or use degraded electrons without chicane.
- Tune-up (using DC magnets)

Try to have symmetric optics as much a possible.

3. Lattice design for shorter BDS and central region integration.

- Allow more emittance growth due to synchrotron radiation at 1 TeV CM.
- Need to consider energy loss and SR power deposition through the BDS.
- Ewan Paterson is organising a group to look at the central integration issues (reliability and operations).
- Dogleg on one side
- Design with missing magnets to pass through remote control area of target

4. New Low-P parameter set
This should not affect the lattice design, ways to introduce the energy correlation needs to be done (beam dynamics group).

Actions from the meeting:

1. Check with the polarimeter group about their preference of polarimeter chicane location – before or after the tuning beam line/dump. (Andrei) ACTION DONE.
The polarimeter location can be after the tuning line (see attached correspondence from Ken Moffeit).
2. Check with polarimeter group about the shorter chicane (if more emittance growth is allowed at 1 TeV CM) (Mark)
3. Check with laser wire people about their preference of laser photons or degraded electrons detection (Deepa/Mark)
4. Make bullet point layouts of different schemes to be discussed at TILC09 (Deepa)
5. Unmatched layout with separate functionality of polarimeter chicane, diagnostics and fast extraction to be discussed at TILC09 (Mark)
6. Shorten BDS length allowing more emittance growth:
   - Upto tuning dump (Mark)
   - Energy collimation (Yuri)
   - Final foucs (Andrei)
   - Matchings and phase advances etc (Frank)
7. Dogleg chicane lattices (James/Deepa)
8. Discuss the progress before TILC09 – Deepa to arrange a meeting before TILC09