Working Assumptions for Low Energy Operations

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Background

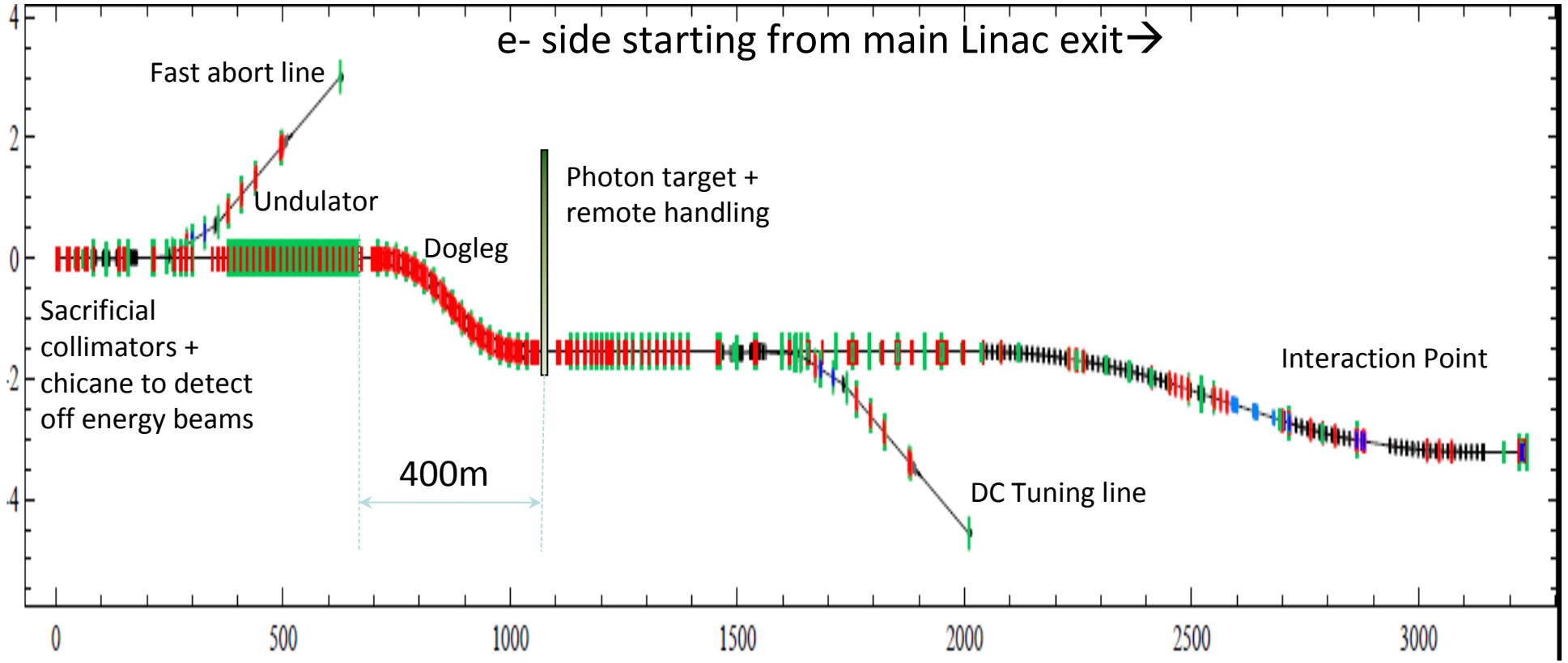
- For SB2009 the undulator is moved to the end of the linac
- The ILC still needs to operate over a wide energy range
- The yield of positrons is not constant with electron energy
- We need a specification for the yield so that we can design the source appropriately
- I asked for guidance on this at ALCPG09
- This talk will discuss the provisional guidance I have received …

Provisional Guidance (from PMs)

- The nominal scheme is used for operation until the beam energy is reduced below the point where the undulator source effective positron yield is below 0.5.
- For operation below that point, the ILC will use an alternating pulse scheme (2.5Hz).
- PMs Suggest:
  - **Pulsed steering magnets are used to correct the launch into the undulator so that there is no natural difference between the high energy (e+ production) and low energy (collision) beam trajectory due to the upstream linac curvature. Of course, the undulator itself is aligned along a laser straight line pointing at the target. The pulsed magnets will have a 2.5 Hz periodic excitation waveform.**
  - **Pulsed trajectory correction magnets may be needed within the undulator.**
  - **Pulsed dipole magnets are used to extract the charged beams between the downstream end of the undulator and the target. There are obvious MPS and magnet/power supply design issues with this sub-system, but it should be feasible. The high energy beam (e+ production beam) should be dumped in the full power BDS tune-up dump.**

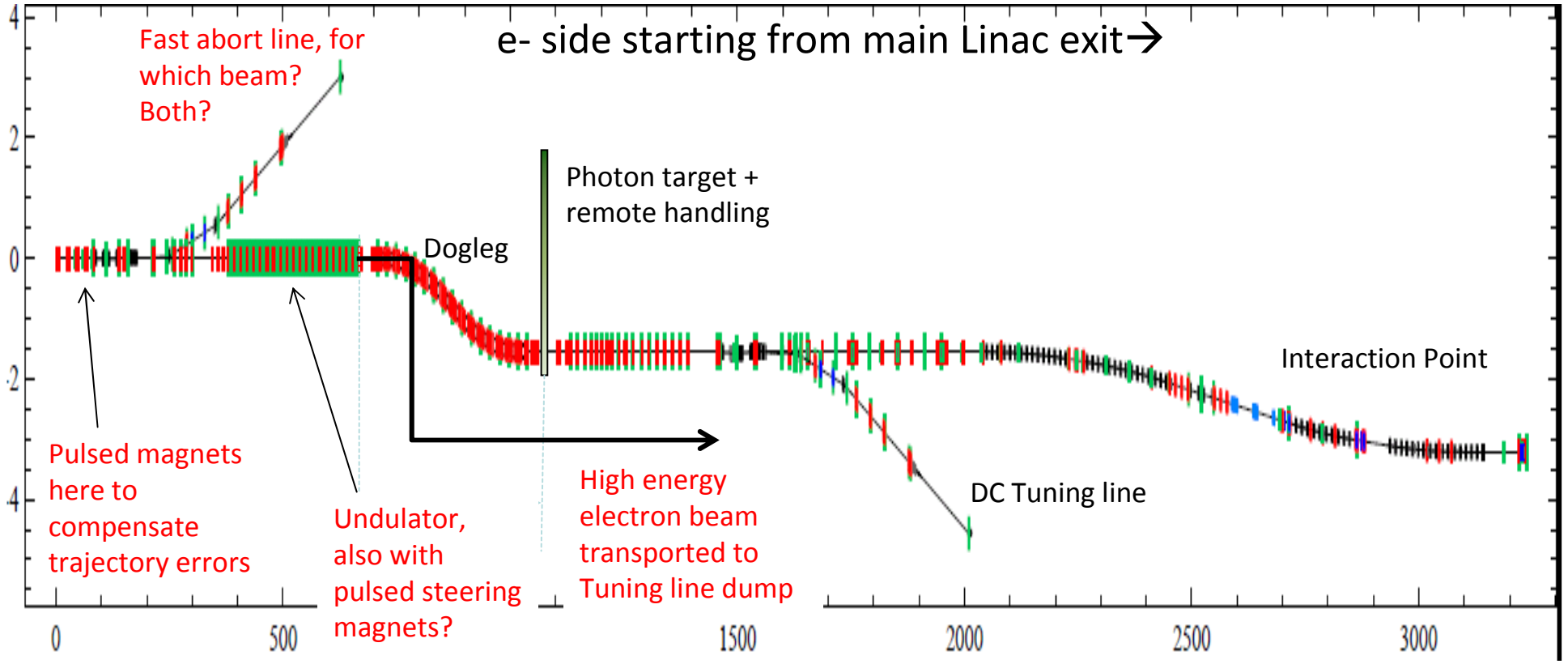
SB2009 Layout

- Electron beam layout



SB2009 Changes

- Low energy electrons transported to IP via undulator and full BDS



Yield vs Energy

- Yield of 1.5 at 150 GeV
- Yield of 0.75 at ~125 GeV
- Yield of 0.5 at ~115 GeV