



# Issues with low energy spin rotators

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- Spin manipulation at 5GeV

RDR Positron Source to Damping Ring with Spin Rotation in LTR at 5 GeV

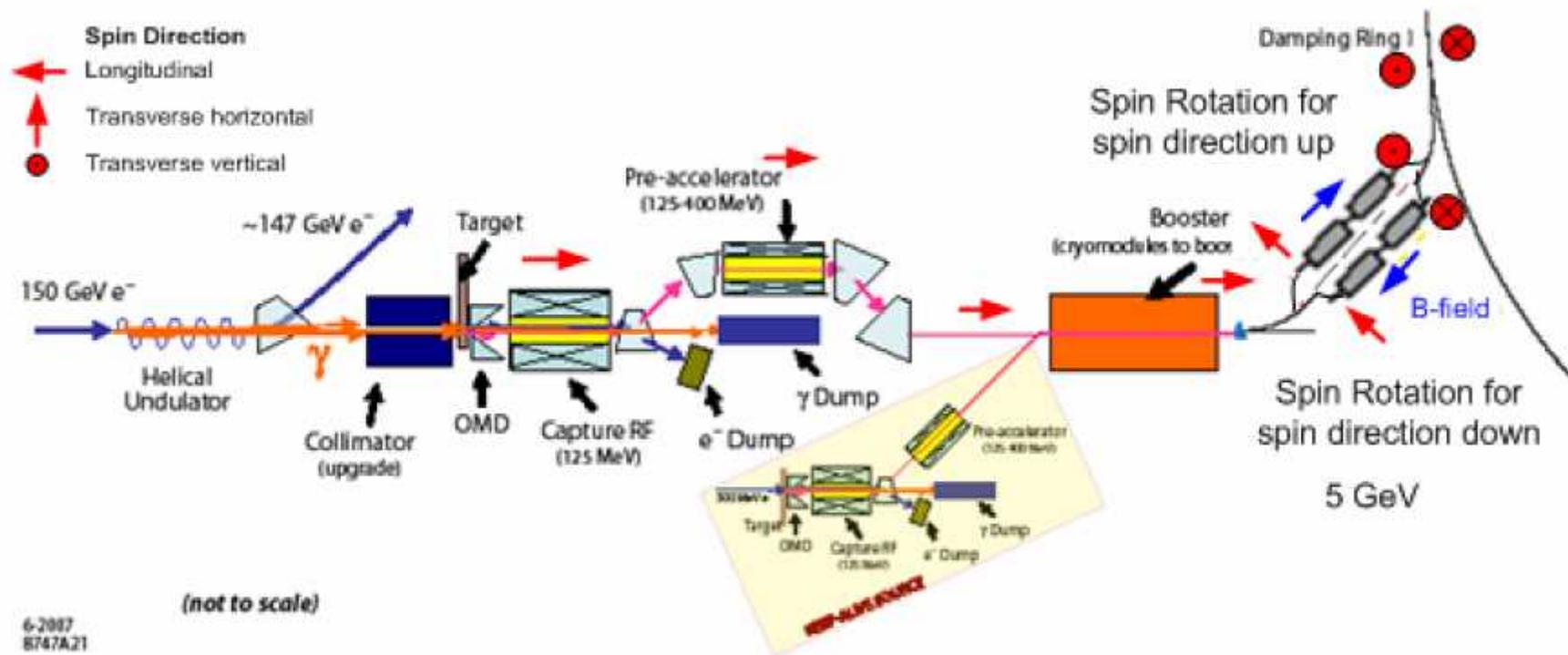
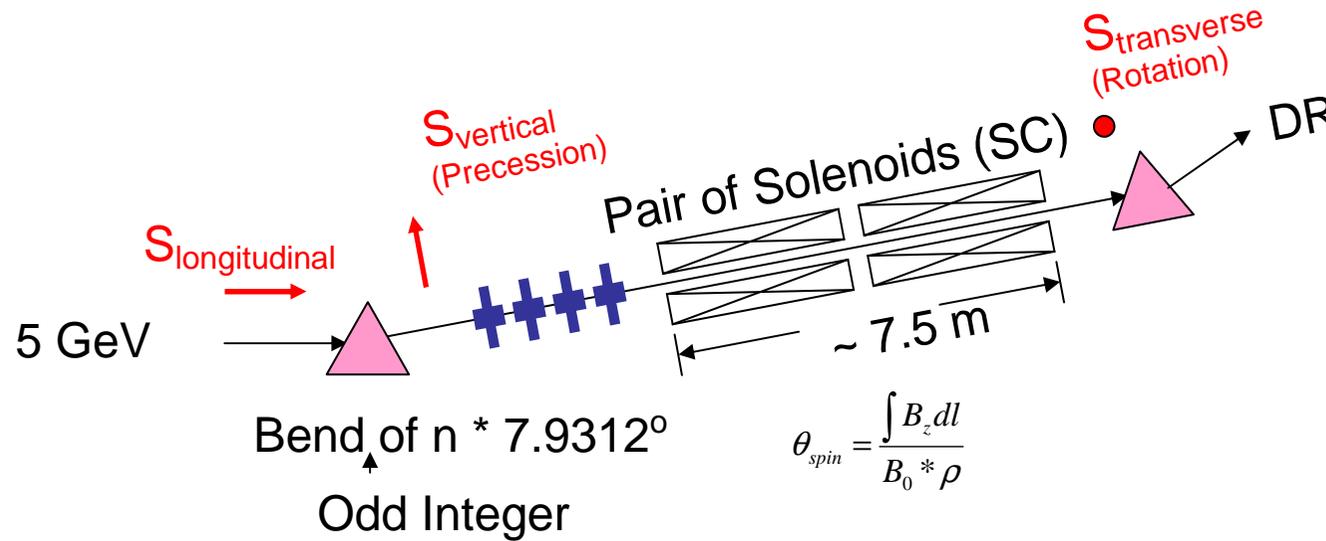


Figure 4: Overall layout of the positron source given in the RDR.



# RDR Spin Rotation System

Axel Brachmann



$$\theta_{\text{spin}} = \frac{E(\text{GeV})}{0.44065} * \theta_{\text{bend}}$$

Dipole and solenoid strength are set by spin manipulation requirements, lattice design remains to be done

Dipole:  $7.9312^\circ$   
 $\rightarrow \sim 0.2 \text{ T}$   
 Solenoid:  $26.2 \text{ Tm}$   
 $\rightarrow 2 \times 3.5 \text{ m}; 3.85 \text{ T}$

Design is based on paper by Moffeit, Woods, Schuler, Moening and Bambade (2005), SLAC-TN-05-045



# The RDR

- Spin rotation at 5GeV requires high field SC solenoids
- Spin flipping (5Hz timescale) requires two spin rotators and strong dipoles to switch between them



# Low energy spin rotator

- Proposal to do spin rotation at 400MeV
- Weaker, cheaper magnets
- Easier to switch from one path to the other ...

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## **Spin Rotation at lower energy than the damping ring**

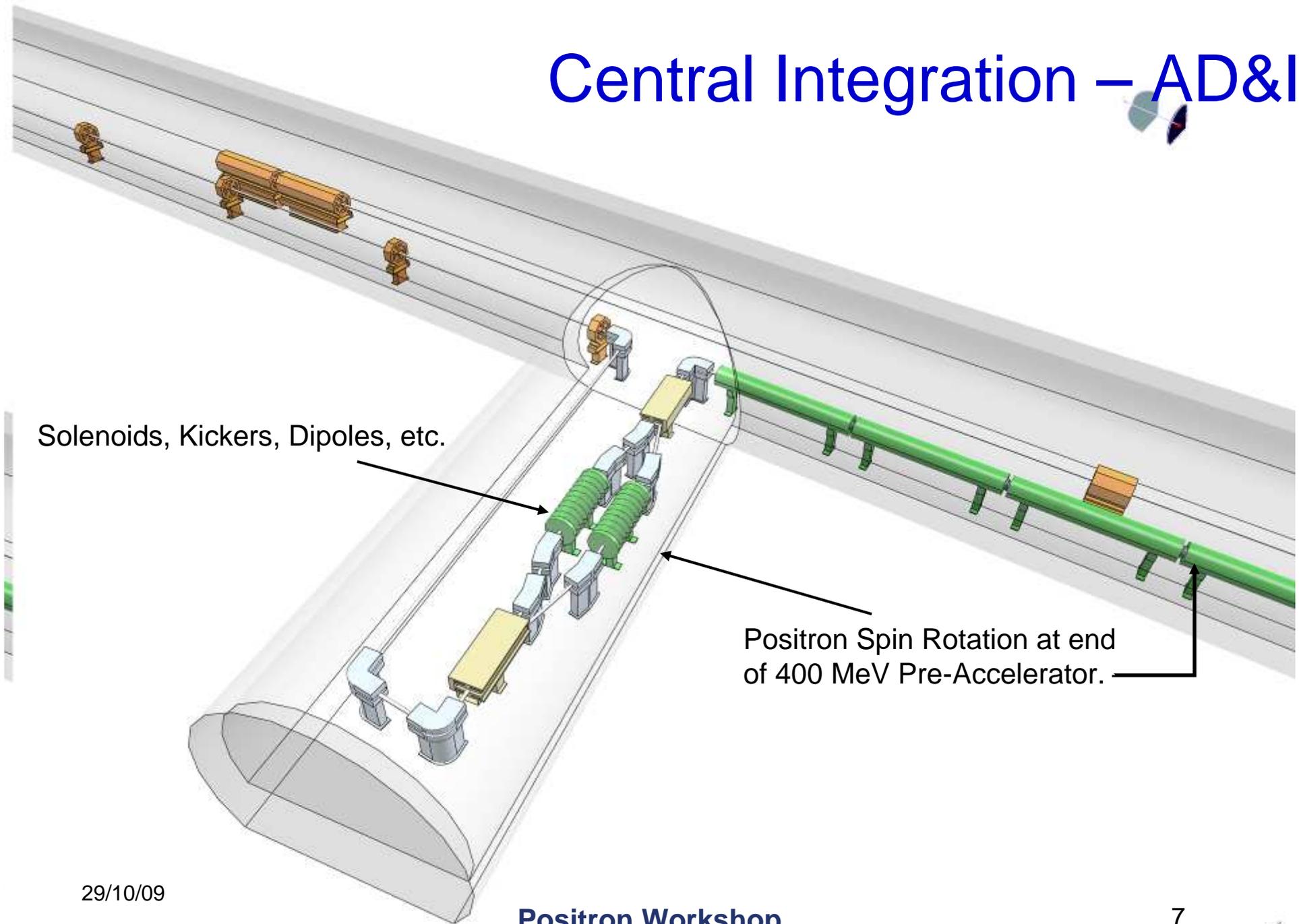
Kenneth Moffeit, Mike Woods and Dieter Walz  
*SLAC*



# The Issues

- Has the large spread in positron energy been considered?
- Can the proposed design transport the positrons with their large emittance?
- Because the magnets have to have larger apertures will they in fact be easier than the 5GeV ones? Same stored energy (John Sheppard)?

# Central Integration – AD&I



29/10/09