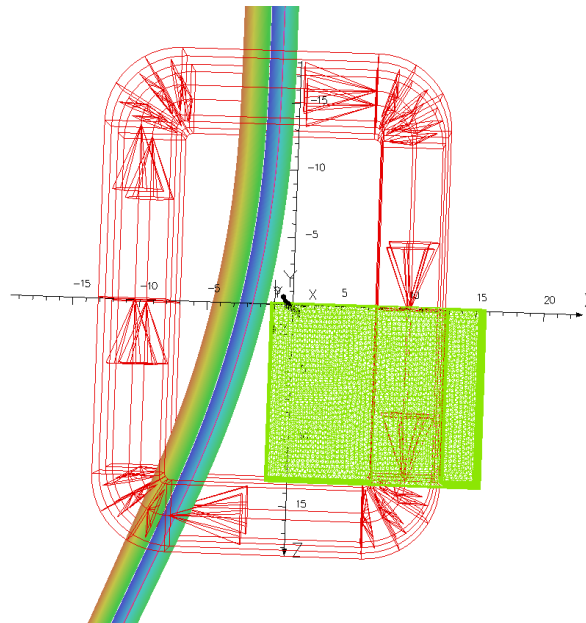




New Design for the 4-inch Switchyard Dipole Magnet

J.A. Crittenden, B. Dunham, K. Smolenski

*Design presently in operation
in the injector prototype beamline*



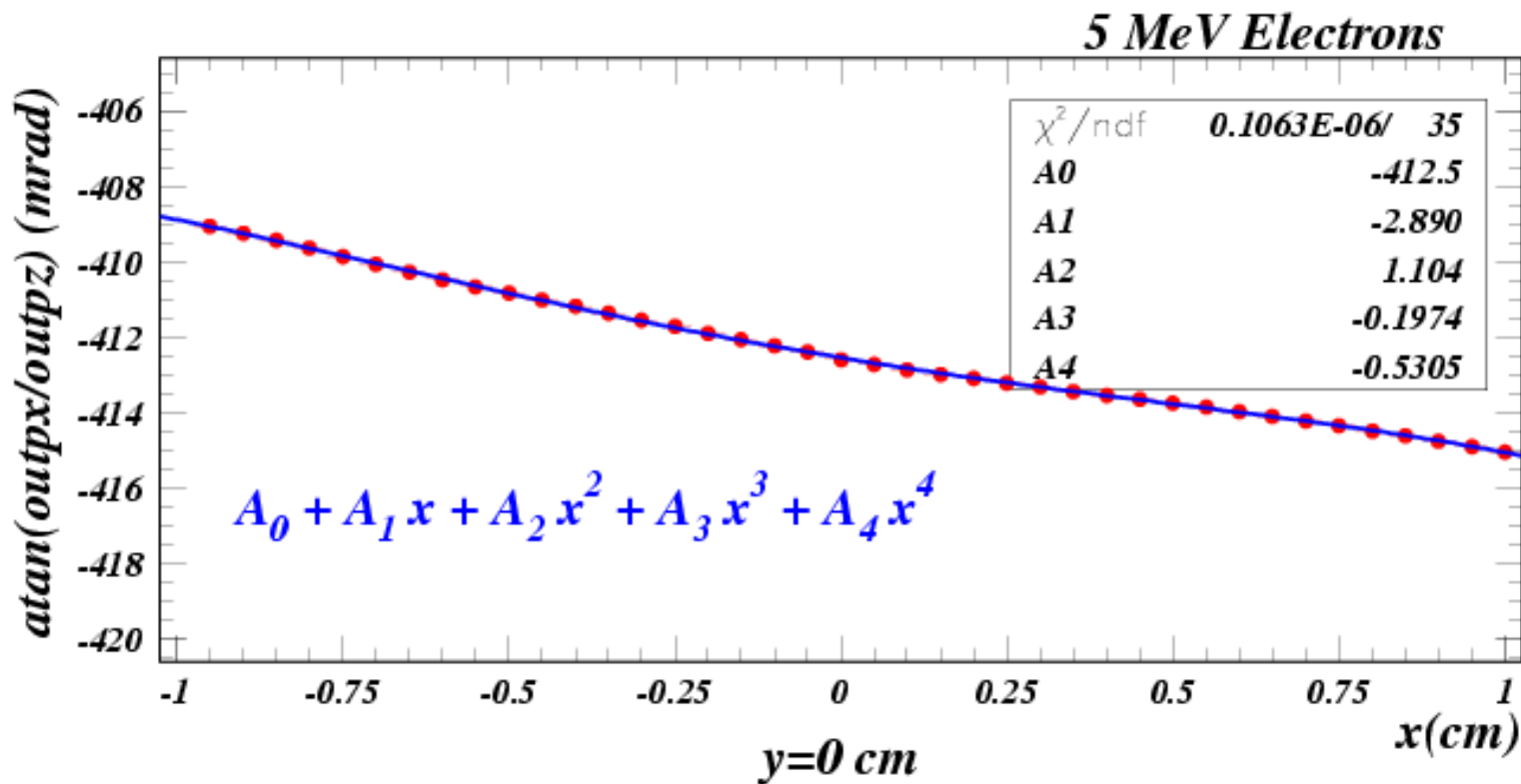
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Cornell Laboratory for Accelerator-Based Sciences and Education

ERL General Meeting

24 June 2010





The bend angle is 24 degrees (419 mrad) for a current of about 2×266 amp-turns.

The beampipe is 1-inch diameter.

This variation of 6 mrad is much greater than the energy spread $0.1\% \times 419 \text{ mrad} = 0.4 \text{ mrad}$.

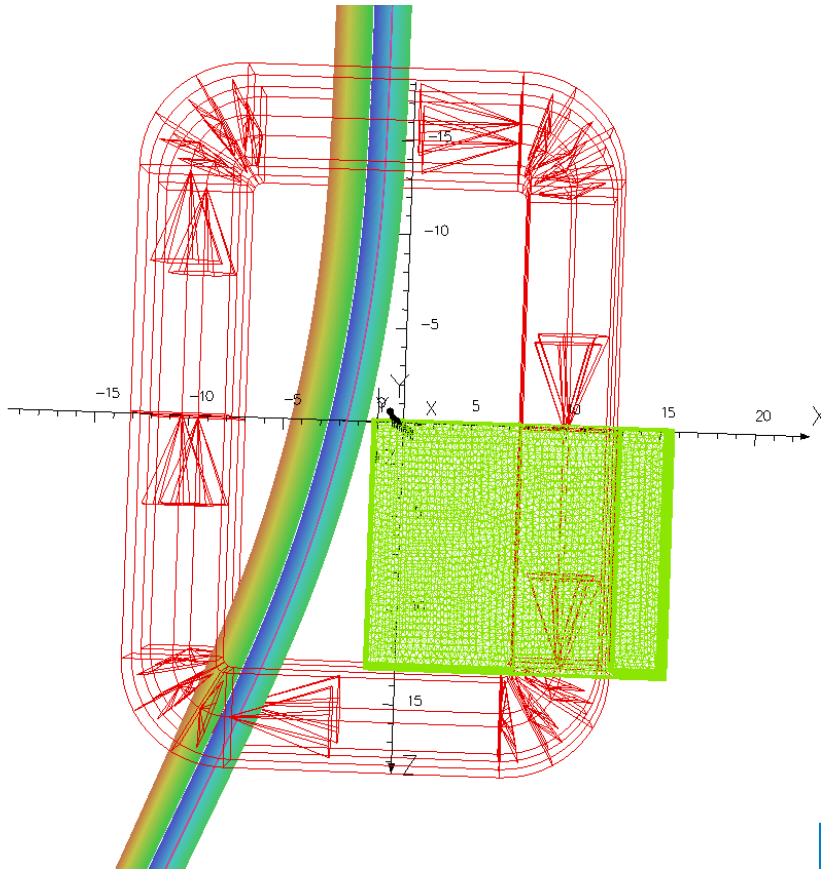


*Redesign: increase steel width sufficiently
to avoid cutting the corner*

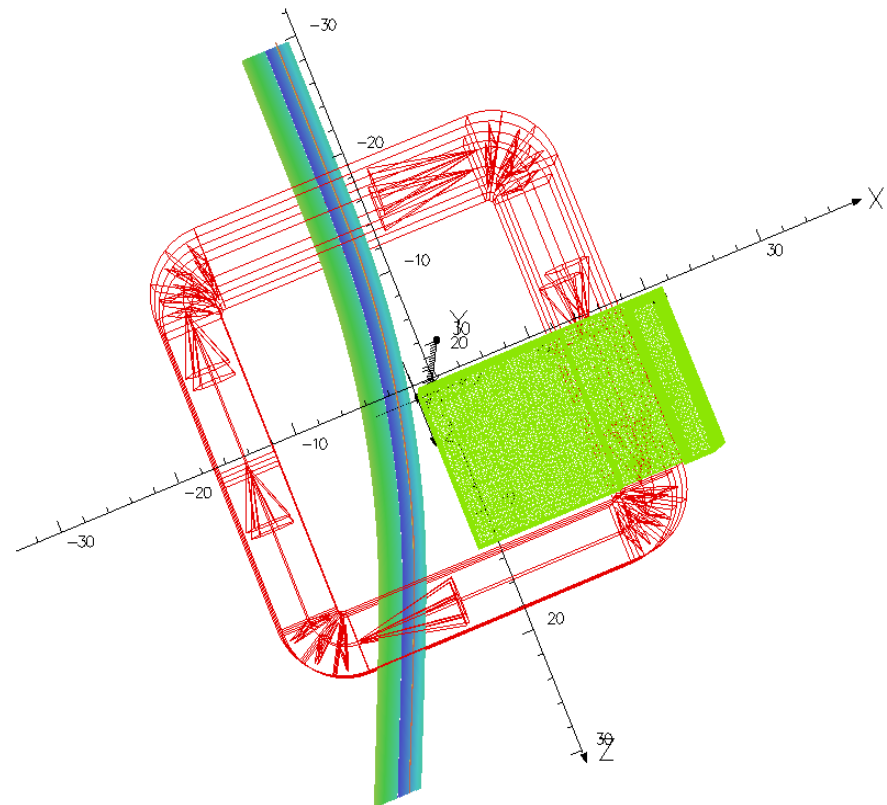
Present Design: 12-inch-wide steel

Scales differ

16-inch-wide steel



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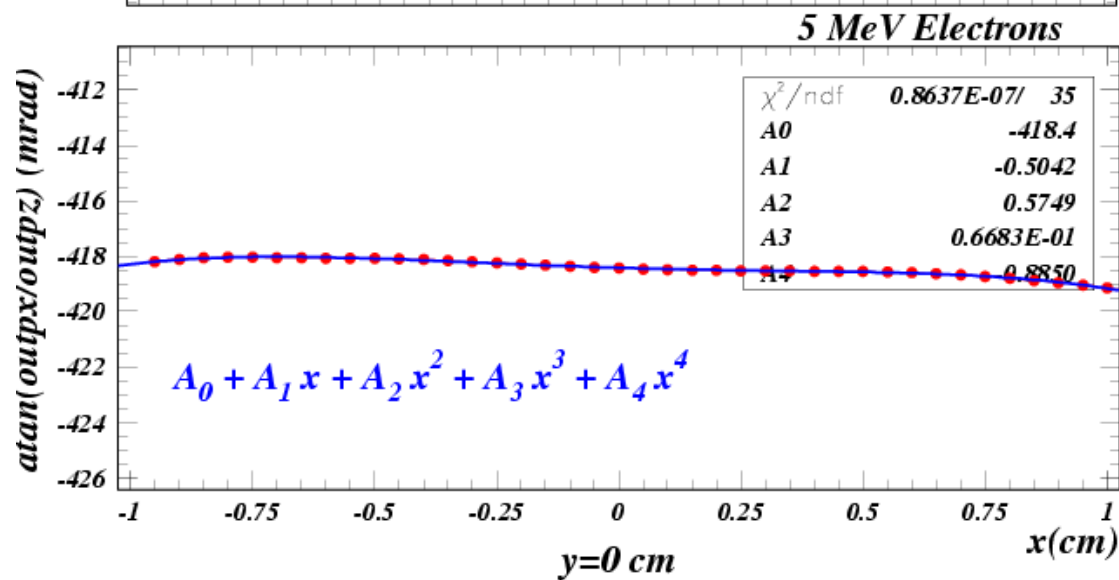
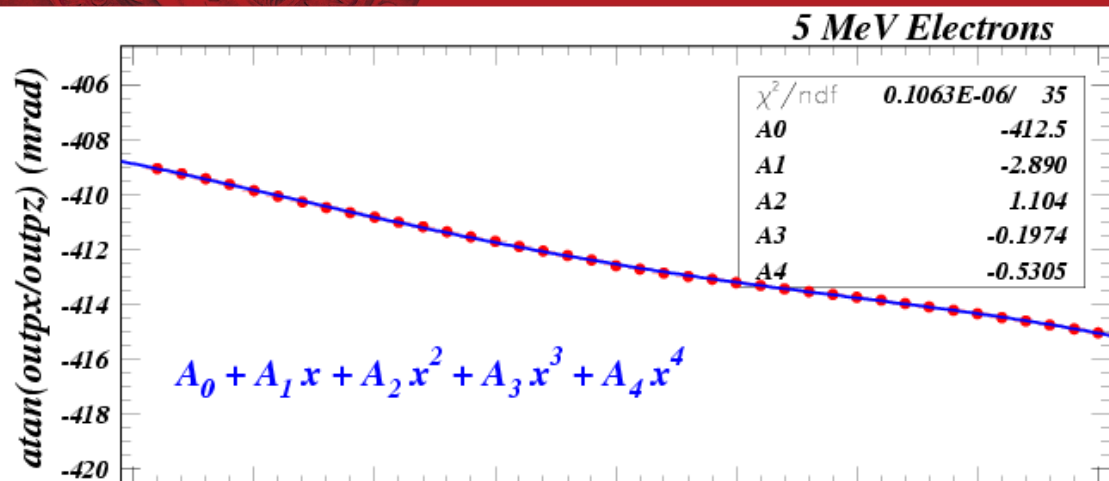


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Present Design: 12-inch-wide steel

16-inch-wide steel



Variation of horizontal bend strength is less than 0.5 mrad.