

# Fringe Fields for Two Configurations of the SiD Iron

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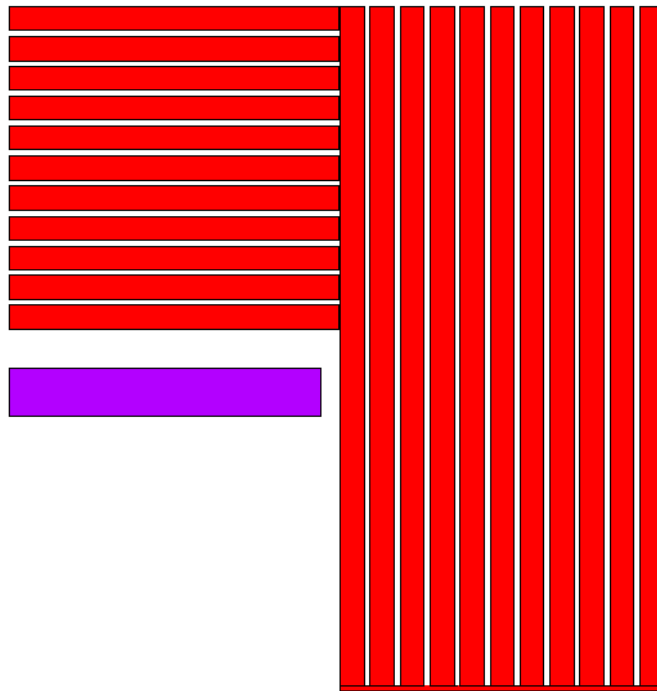
# Introduction and Summary

- Projective and Non-Projective Iron Geometries were compared for Fringe Fields outside the barrel region
- The projective geometry produces dramatically lower fringe fields with much reduced spike near endwall/barrel junction
- Some statistics for each endwall geometry are presented (weight, magnetic forces, deflections)

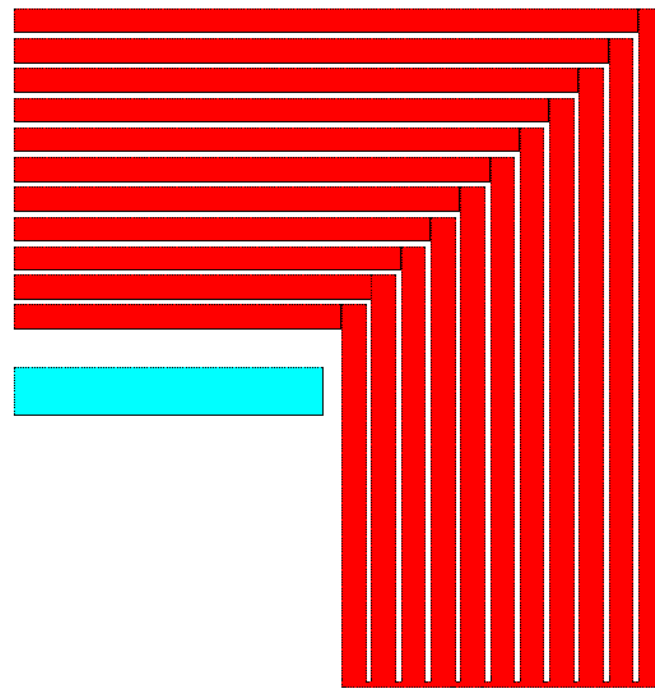
# The Two Iron Geometries

plates are 20 cm; gaps are 5 cm

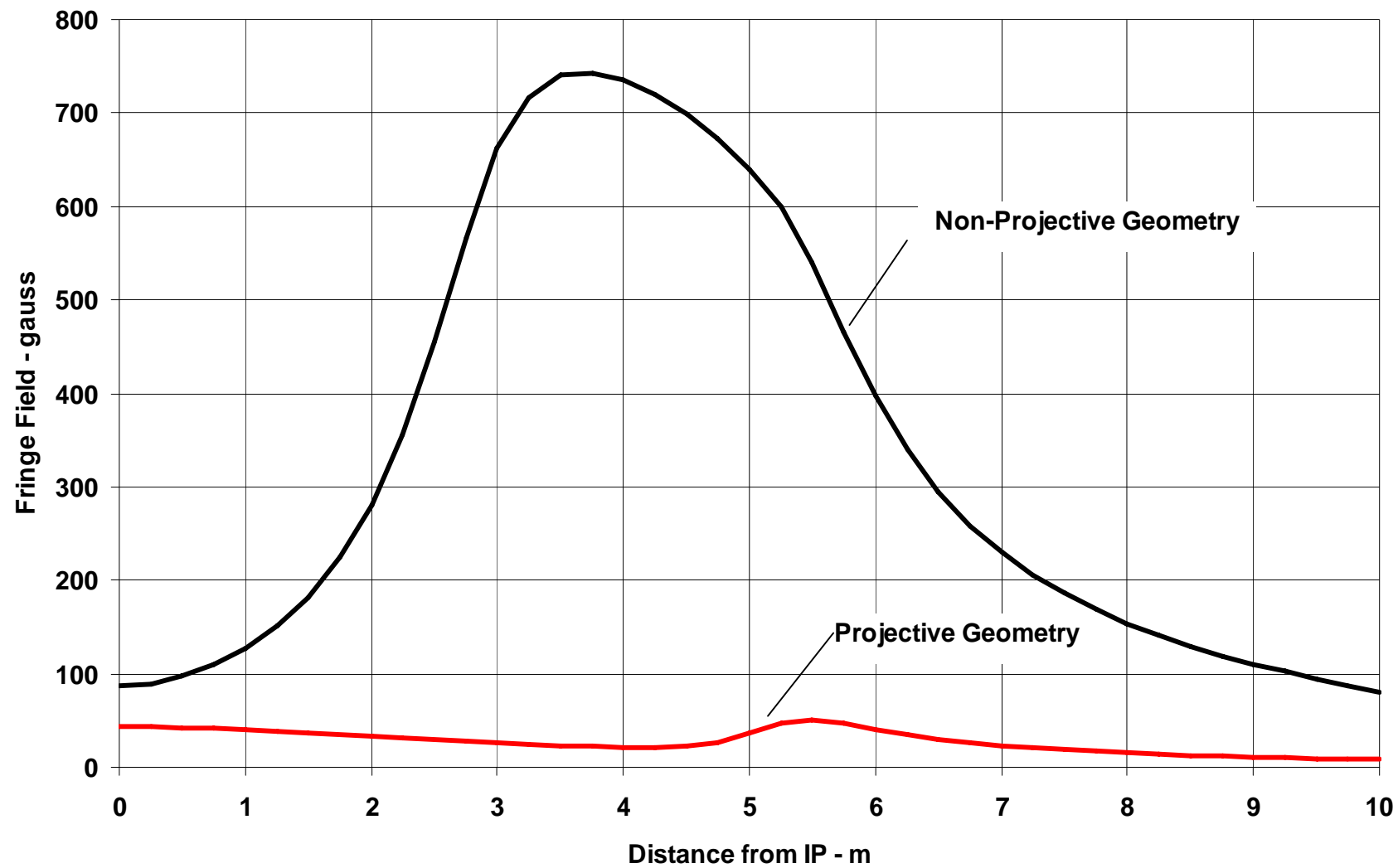
clearance is 1 cm



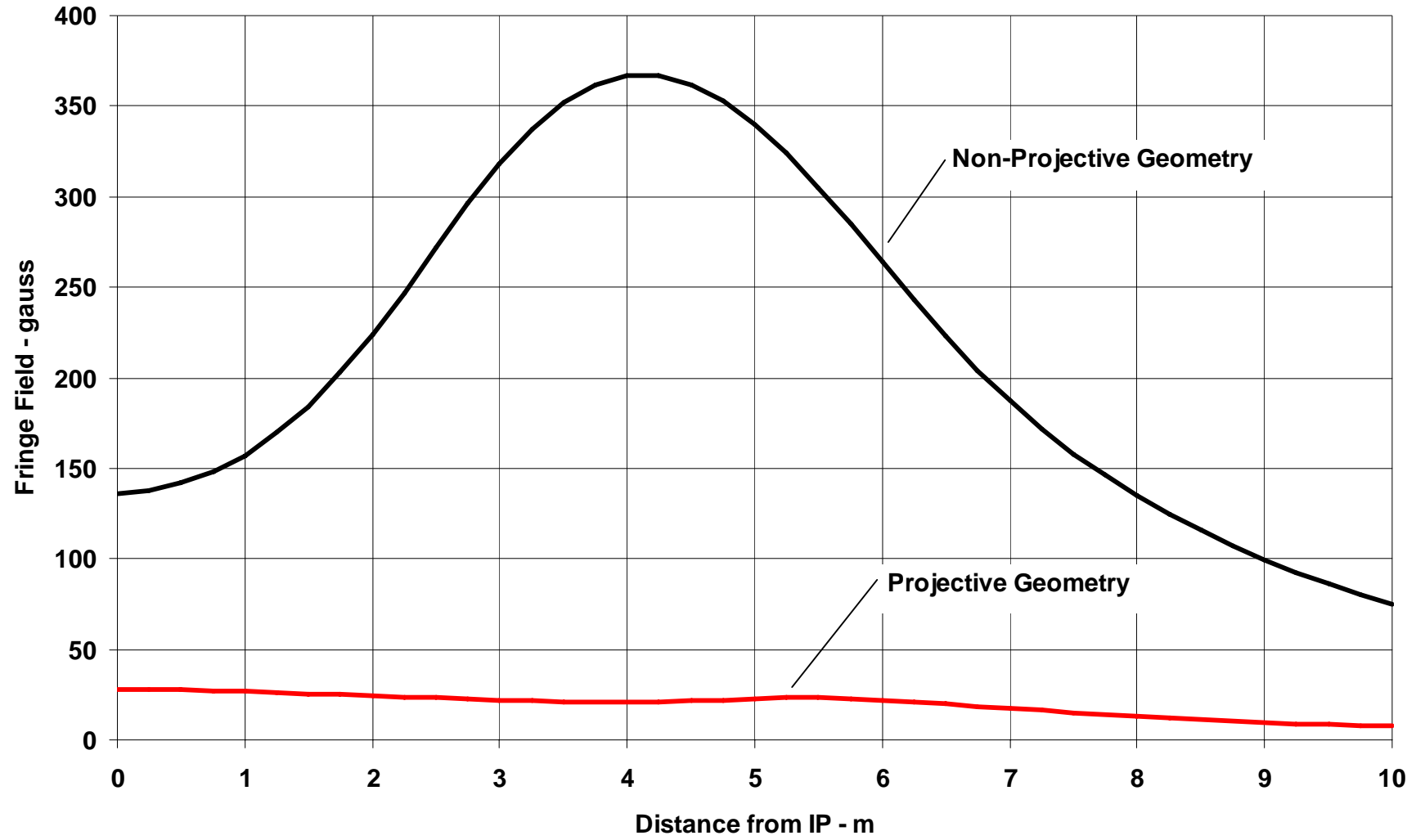
clearance is 1 cm



Fringe Fields at R = 6.5 m (~ 0.5 m outside barrel)

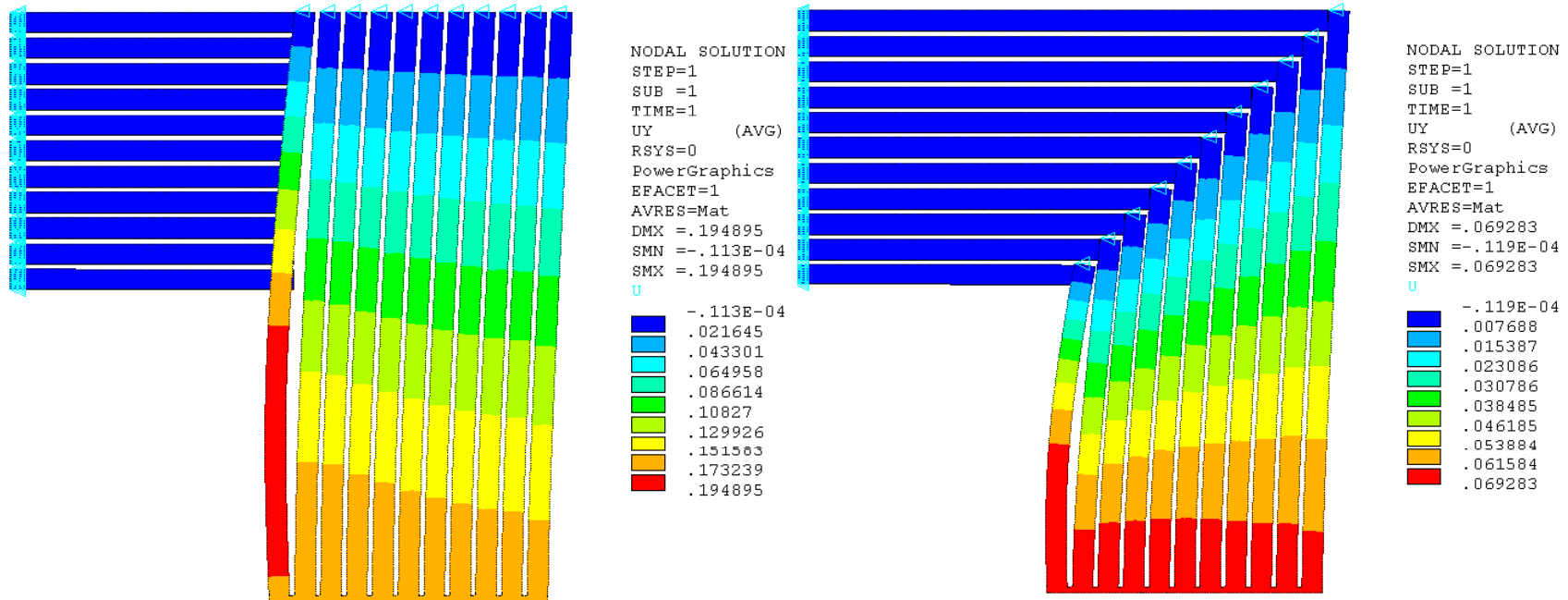


Fringe Fields at R = 7.5 m (~1.5 m outside barrel)



# Comparison of Axial Deflections

- Plates were constrained on outer radius
- Inner tube connects ID of plates



inner plate of projective geometry has ~ 50% more load than inner plate of non-projective geometry, but smaller diameter plate is inherently stiffer

# Plate Weights and Magnetic Forces

## Non-Projective Geometry

Plate	Axial Magnetic force - tons	Weight - tons
1	5430	190
2	2570	190
3	2350	190
4	2150	190
5	1980	190
6	1840	190
7	1730	190
8	1640	190
9	1580	190
10	1540	190
11	1490	190
<b>Total</b>	<b>24300</b>	<b>2090</b>

## Projective Geometry

Plate	Axial Magnetic force - tons	Weight - tons
1	8050	63
2	2600	73
3	2240	83
4	1920	94
5	1660	106
6	1460	118
7	1280	131
8	1160	145
9	1030	160
10	930	175
11	830	190
<b>Total</b>	<b>23160</b>	<b>1338</b>

# Support Considerations

- Non-projective endwall may be supported from underneath
- Projective endwall will have to be cantilevered from something (barrel? external frame?)
- Both geometries would benefit from a strongback to stiffen assembly
- Begin the turf wars – structure vs instrumentation