

Linac Acceleration Structures Sorting & Lattice Opportunities Photo-Injector Physics

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Diagnostics Group
APS-ASD

t-cav/pc gun
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Introduction:

- Reconfiguration - Linac Beam Line Preparation for PC Gun **Completed**
- L1AS1 Survey Results (post reconfiguration solenoid removal)
- Opportunities for L1 Lattice Implementation (add quadrupoles?)
- Linac Accelerating Structure Sorting (see linac layout drawing)
 - Type 1 structure (4 strong back to girder supports, center dist)
 - Type 2 structure (2 strong back to girder supports, end dist)
 - Water Manifold Distribution Mixed for Lattice Change.
- Opportunities for L2, L5 Lattice Adjustment (quadrupole placement?)



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Key Personnel: {single point of contact engineering lead: *Bill Berg*}

Hardware Leads:

- Feed Waveguide: *Art Grelick*
- Rigging: *Ed Theres/Ralph Bechtold*
- Water: *Rob Wright*
- Vacuum: *John Hoyt*
- Supports, Beam Line Comps, Accelerating Structure: *Leonard Morrison*
- Diagnostics, Laser Transport: *Bill Berg*
- Virtual Cathode, Laser Table: *Jeff Dooling*
- Kicker Delay Line & Power Supplies: *Al Hillman*
- ACIS Validation: *John Forrestal, Ken Belcher*
- Survey & Alignment: *Merrick Penicka*
- AC Power: *Glenn Kailus*

Support Personnel

- Health Physics: *John Vacca*
- ESH: *Jim Lang*

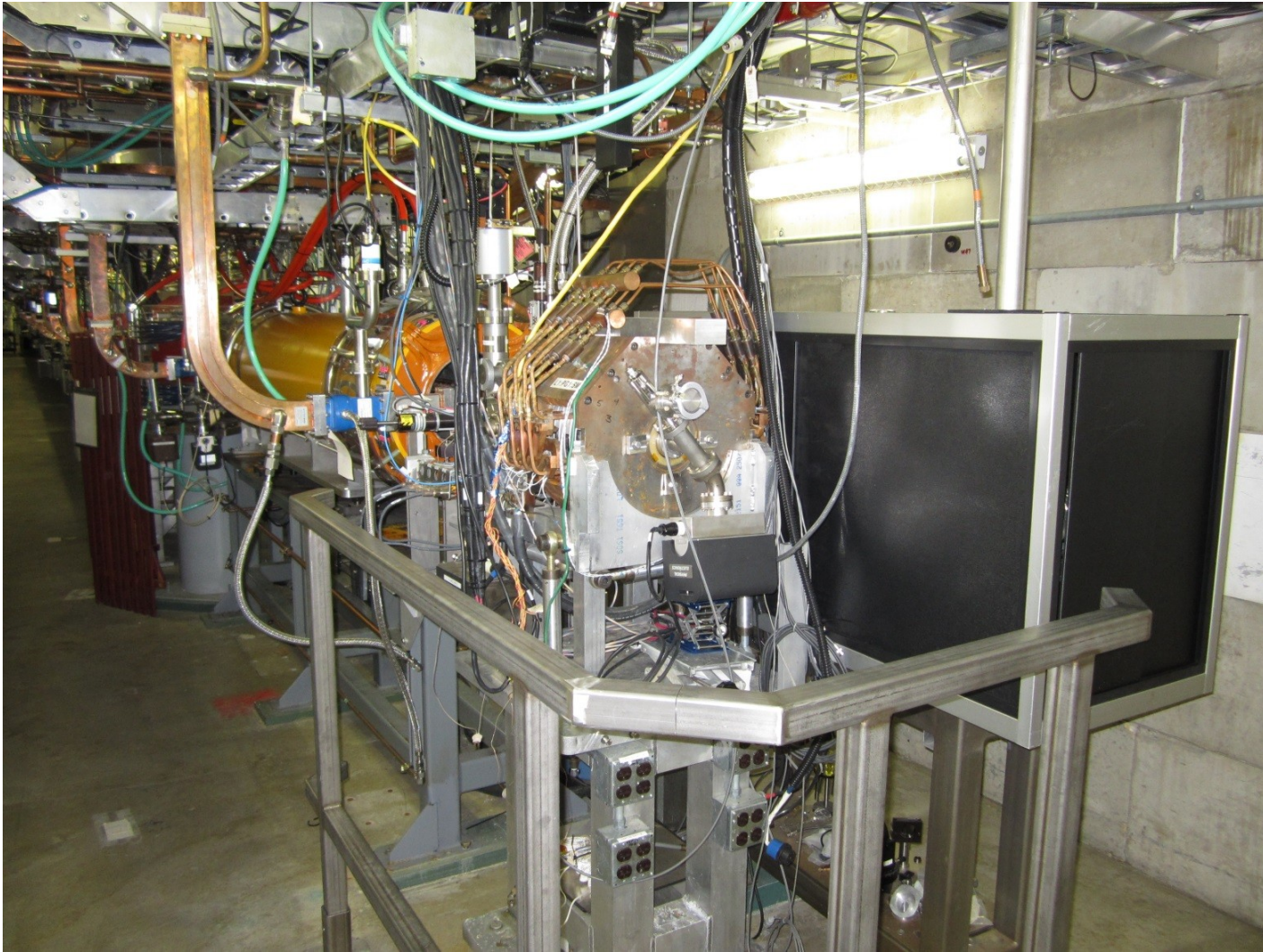


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Linac Reconfiguration Technical System Readiness Signoff Sheet	5/10/2013			
	Date	Name	Signature	Comments
Feed Waveguide and SFG Switching Network	5/10/13	Terry Smith	Terry Smith	
Rigging & Shielding Wall	5/13/13	Ed Theres	Ed Theres	
Water Systems	5-10-13	Rob Wright	Rob Wright	
Vacuum Systems	5-10-13	John Hoyt	John Hoyt	
Supports, Beam Line Comps, Accelerating Structure	5/10/13	Leonard Morrison	Leonard Morrison	
Diagnostics, Laser Transport	5/10/13	Bill Berg	William J. Berg	
Controls	5/10/13	Steve Shoaf	Steve Shoaf	
Virtual Cathode & Laser Table	5/10/13	Jeff Dooling	Jeffrey C. Dooling	
Kicker Delay Line & Power Supplies	5/10/13	Al Hillman	Al Hillman	
RSS ACIS Interface & Validation	5/10/13	Ken Belcher	Ken Belcher	
Survey & Alignment	5/13/13	Merrick Penicka	Merrick Penicka	
AC Power Modifications	5/13/13	Glenn Kallus	Glenn Kallus	
Shielding Configuration & HP Hardware Survey	5/13/13	John Vacca	John Vacca	
ESH	5/16/13	Jim Lang	Jim Lang	
Global Linac Reconfiguration Hardware Readiness	5/13/13	Bill Berg	William J. Berg	



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Linac Front End Reconfiguration “Before”- Sector L1



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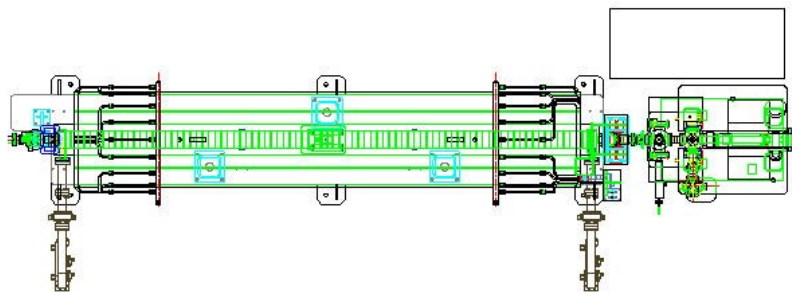
Linac Front End Reconfiguration “After”- Sector L1



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Beam Line Reconfiguration:

BEFORE



AFTER

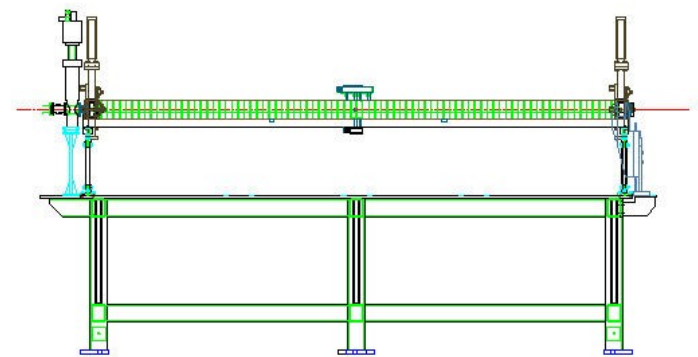
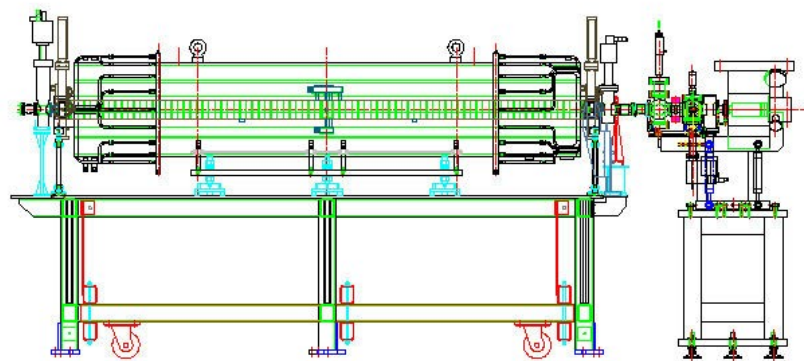
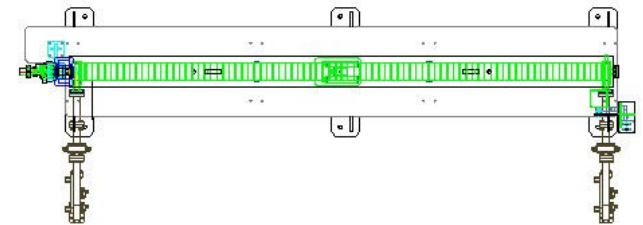
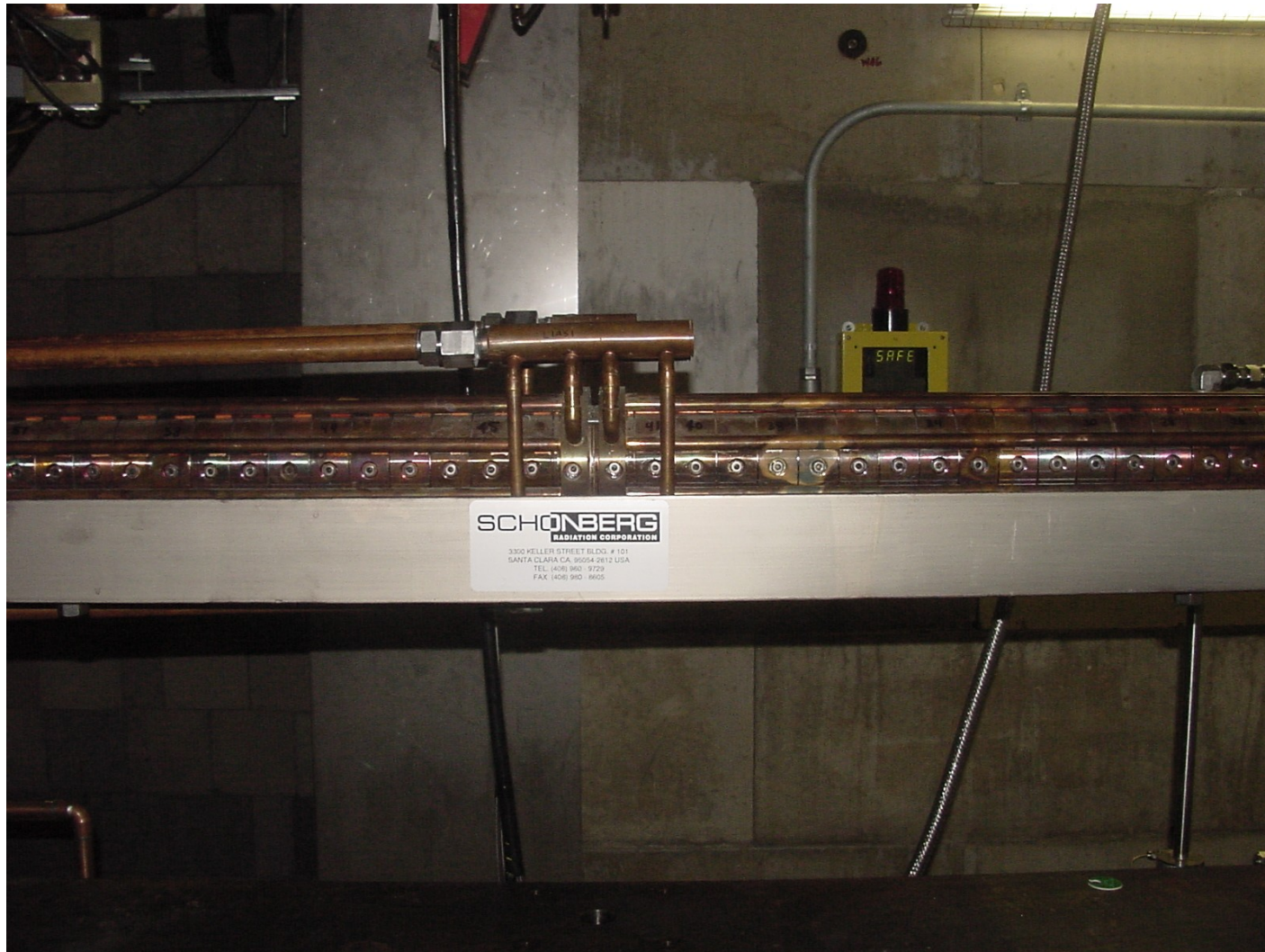


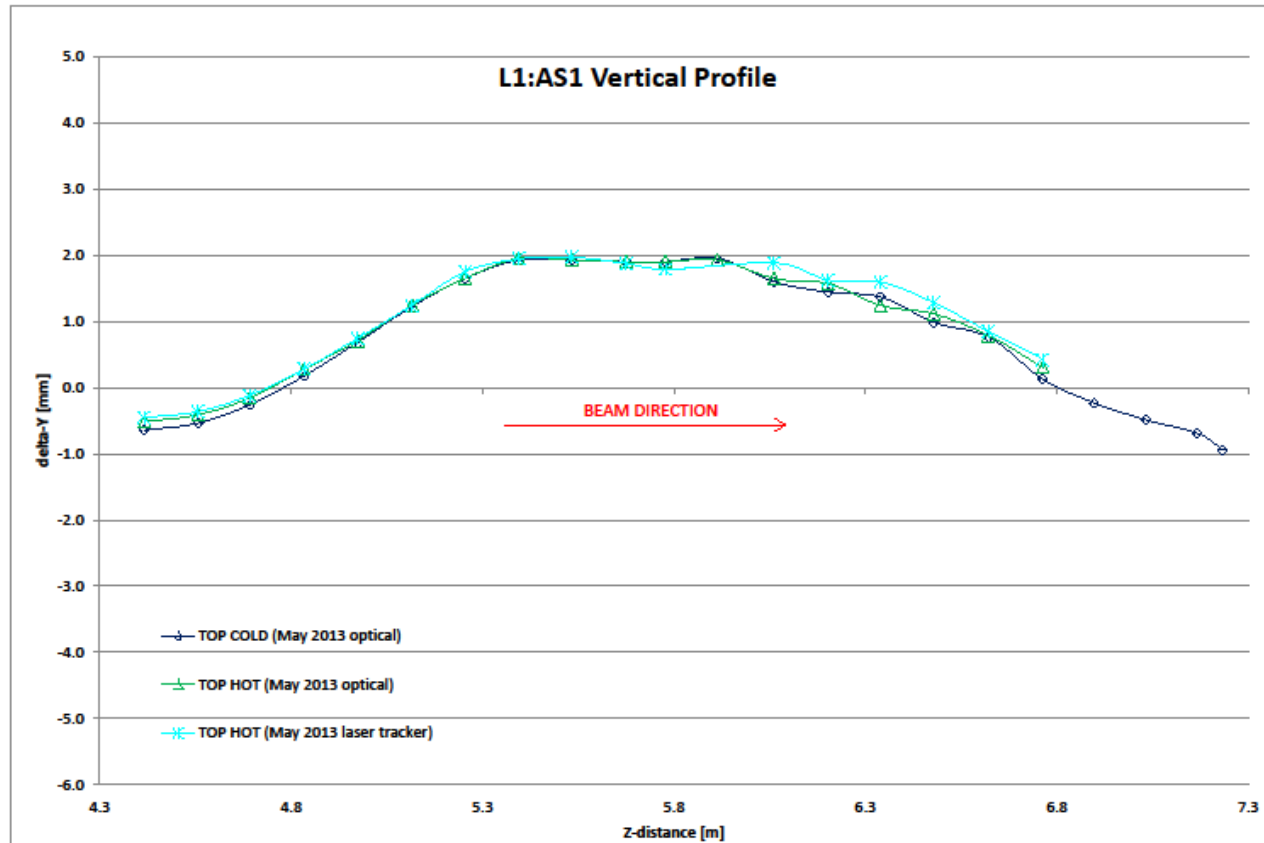
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Linac Front End Reconfiguration “After”- Sector L1:AS1



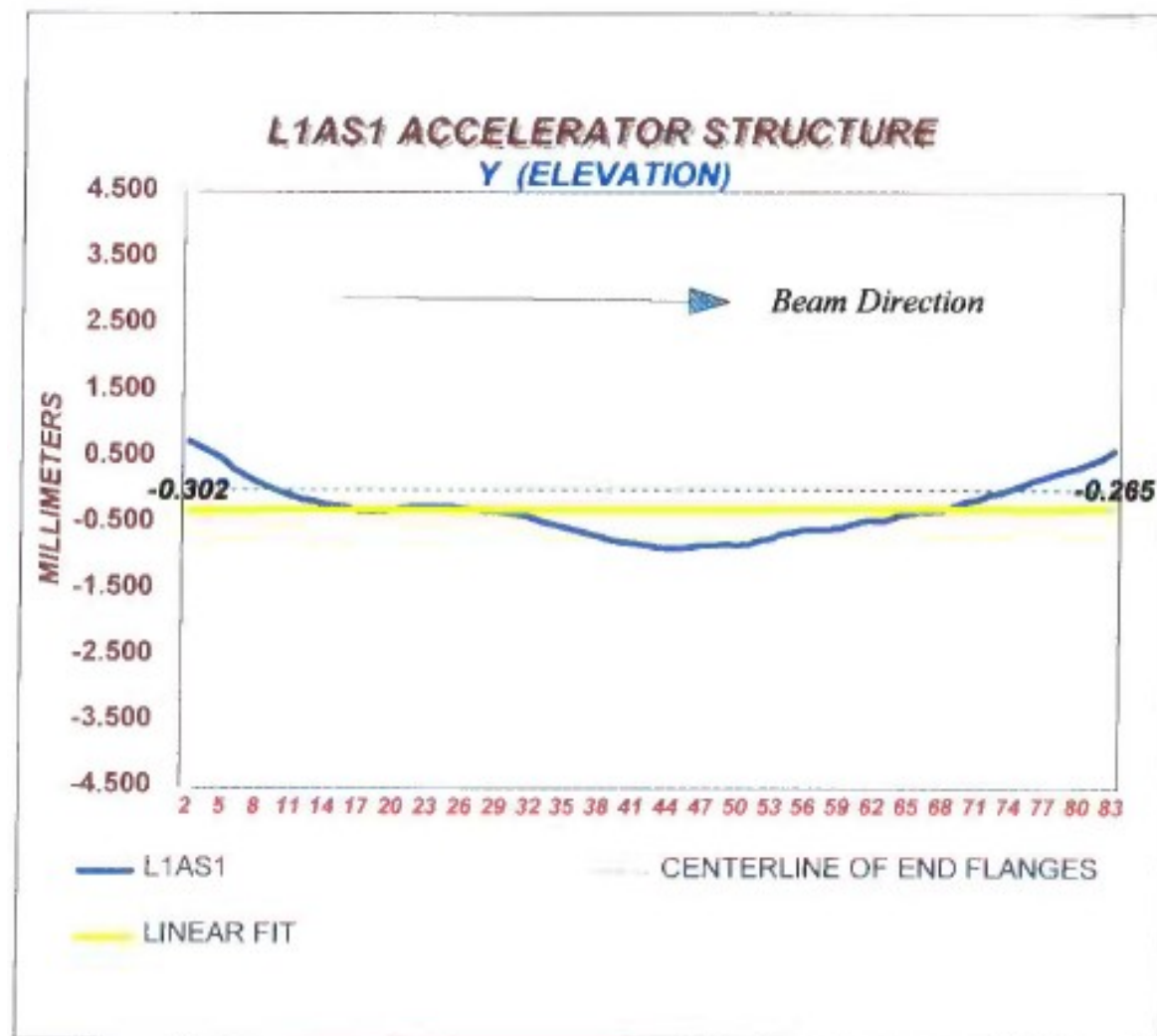
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Sector L1: AS1 Vertical Profile, May 2013

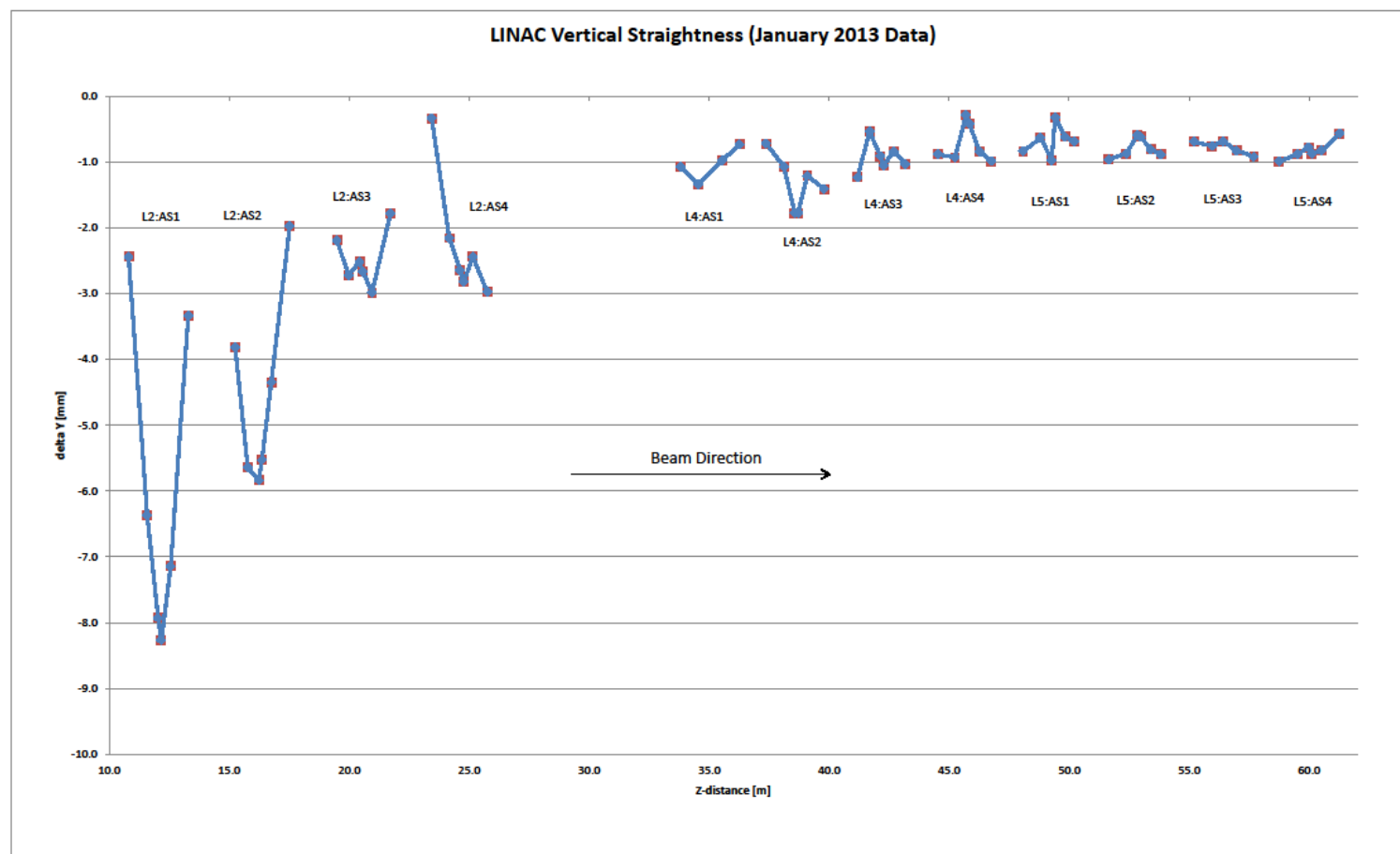


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Sector L1: AS1 Vertical Profile, October 1999

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L2 through L5 Accelerating Structures, January 2013



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Sector L1 Center of AS1, Water Manifold at Center



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Sector L5 Center of AS3, No Manifold at Center (right of quad)

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Sector L5 Down Stream End of AS3, Water Manifold at Ends



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Conclusions:

- Reconfiguration Opens Opportunity for New Lattice Implementation in L1
- Sorting of Accelerator Structure Types Must Consider Quad Placement
- Significantly Bent Structures are Likely to be Rotated Out of the Machine
- Sorting Opens Opportunity for Broader Lattice Adjustment (L2, L4, L5)



End of Presentation