

NLC - The Next Linear Collider Project



# SLC Positron Target Analysis

**Analysis of the failed SLC positron production target. Work to be done at LANL.**

*Vinod Bharadwaj  
26th May, 1999*

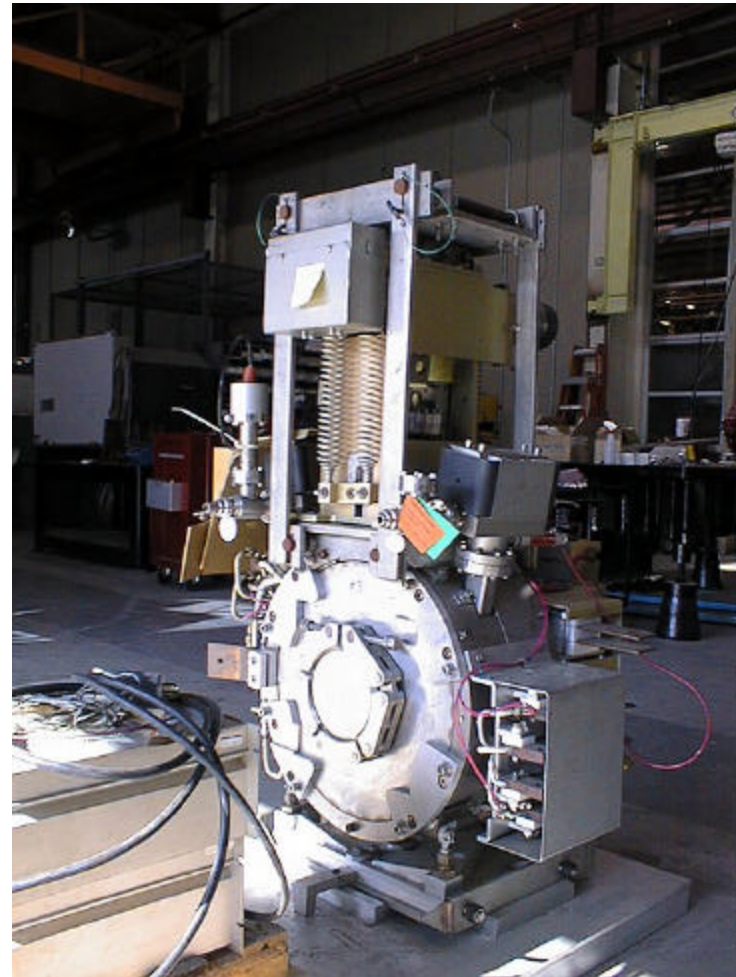
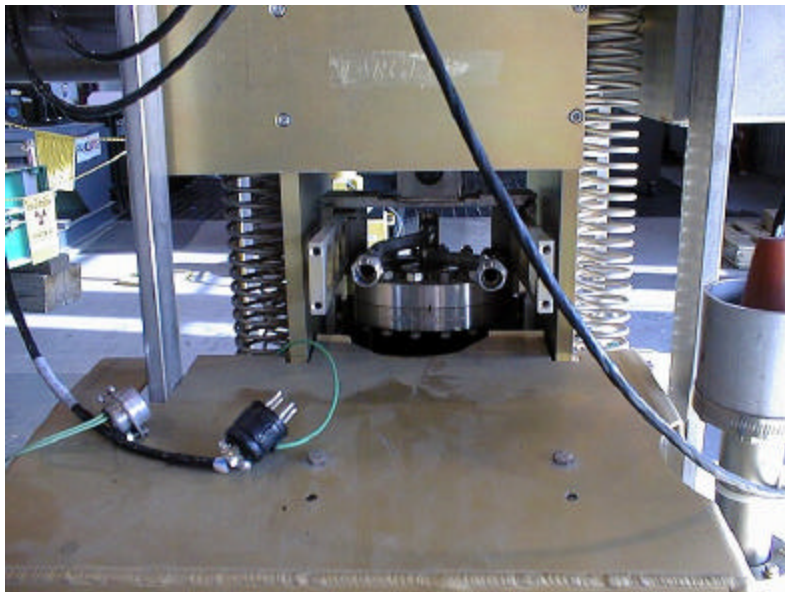
# SLC Positron Target Analysis

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- Baseline NLC target design based on calculations and beam measurements done for the original SLC positron production system.
- The SLC target failed on a water-to-vacuum leak and some damage was seen to the target material. This was almost co-incident with a 10% increase in the drive intensity.
- Need to analyze the target and determine whether target failed due to age or because it exceeded some threshold
- Target station is highly radioactive - disassembly and analysis will be done at LANL
- Two stages / visual & non-destructive / destructive
- LANL has good knowledge of targets > help with design

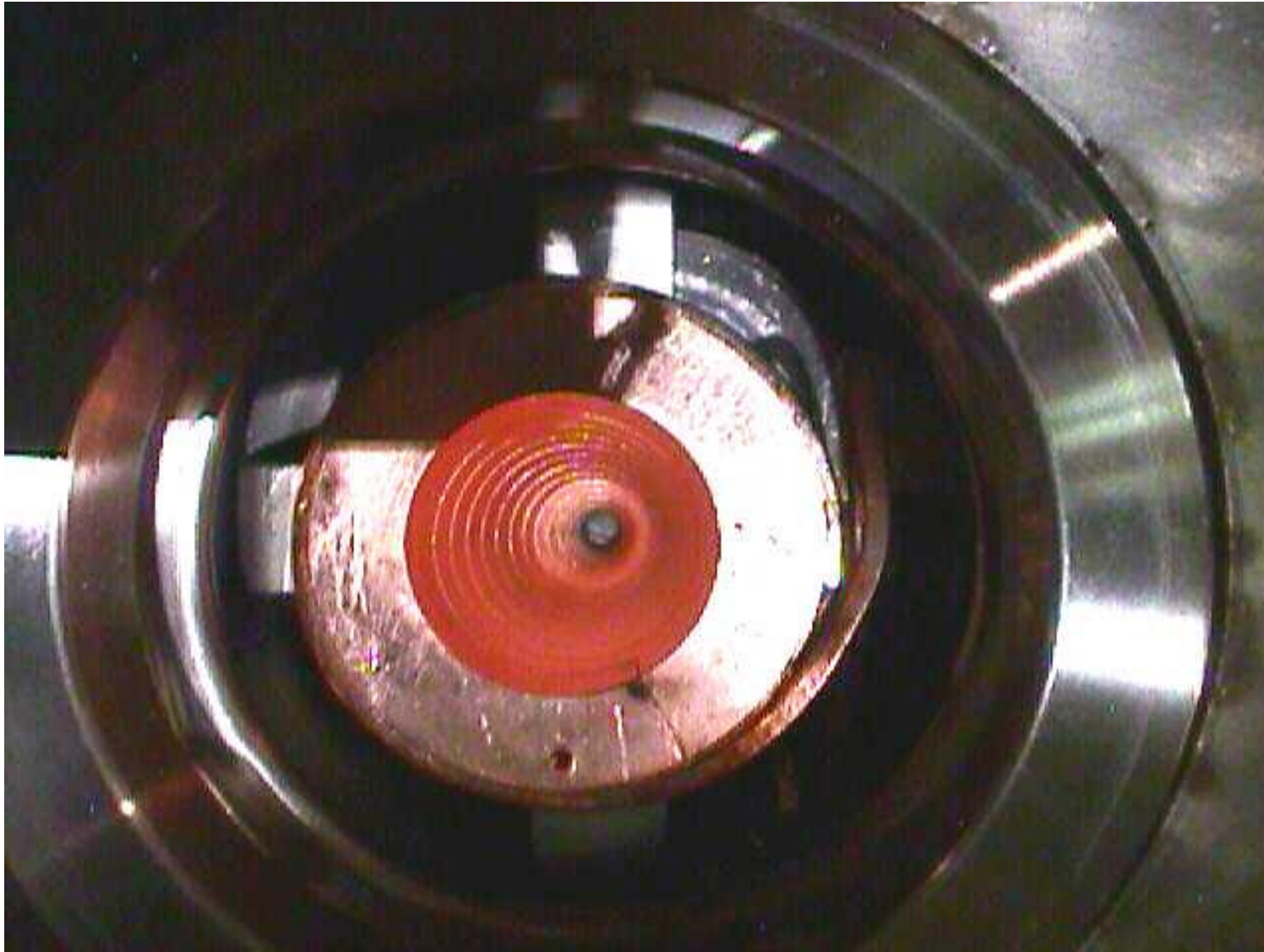
# SLC Positron Target Station

- SLC target station
- target detail



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# SLC Target Damage



*Vinod Bharadwaj  
May 26, 1999*

## Analysis - Planning

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- **Documentation:** Amend the USQ (determine if performing work on the target presents unresolved safety questions) and write a procedure and a hazard control plan
- **Mock-up tests**
  - Determine if an X-ray could be performed to examine the target. Determine the power needed.
  - Determine target dose levels.
  - Determine the parameters needed for cutting and polishing slices from the tungsten/rhenium target.
  - Observe another target set-up to determine if it is feasible to loosen the bolts in the corridor of the hot cells to remove the irradiated target. Plan a trip to SLAC to see a target set-up
  - Set-up and test a method for leak testing the target in a hot cell or in the corridor.



## Analysis - Non-destructive

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- **Hot cell work**
  - Ship the target and holder from Stanford to the LANL CMR building.
  - Open the box before entering the corridor
  - Remove the target in the hot cells or corridor by unscrewing the bolts which hold it in place.
  - Place the target in cell 16.
  - Send other pieces disposal.
  - Use macroscopic camera to examine the target.
  - Leak check
  - X-ray target
- **Discuss data and determine how to proceed**



## Analysis - destructive

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- Remove the stainless steel arm from the target using the bandsaw.
- Use a slow speed cutting saw or a wire cutting saw to cut wedges from the target.
- Polish slices from the target and perform microhardness traces across the target.
- examine the tungsten-rhenium/silver interface and the silver/stainless steel tubing interface
- examine the inside of the stainless steel tubing
- chemical analysis of the target material
- Share results with researchers at Stanford.
- Analysis finished by end of this fiscal year
- Cost \$150 K + \$ 10 K for shipping + 0.1 SLAC FTE.