WINDOW MANUFACTURE AND MEASUREMENT

Don Summers
University of Mississippi-Oxford

Absorber Review
Neutrino Factory and Muon Collider Collaboration
WH8 Hornet’s Nest / WH7X Racetrack
Wilson Hall
Fermi National Accelerator Lab
Batavia, Illinois 60510
17 May 2004
Manufacturing Thin Aluminum Windows

- Windows contain LH$_2$ for muon cooling
- Aluminum Alloy 6061-T6
- New Romi M27 NC Lathe at Mississippi
- Convex backing plate is essential

- Two “bellows” windows are now complete
Measurement: Alvin’s Anvil

- Need to confirm NC lathe measurement
- Use two Starrett T468 micrometer heads
- Two inch barrels readout 0.0001” directly
- Electrical contact aids the measurement
Measurement Result

- Central thickness = 0.0046” = 117 microns

- Future windows
- 2% Lithium – Aluminum / Alloy 2195
- Used in Space Shuttle LH$_2$ tanks
- 80 ksi vs. 45 ksi 6061-T6 yield strength
- Aluminum is 40% stronger @ 200K
- Additional safety margin
- Need to check for outgassing