

8inch MCP vacuum coating system at Fermilab status update

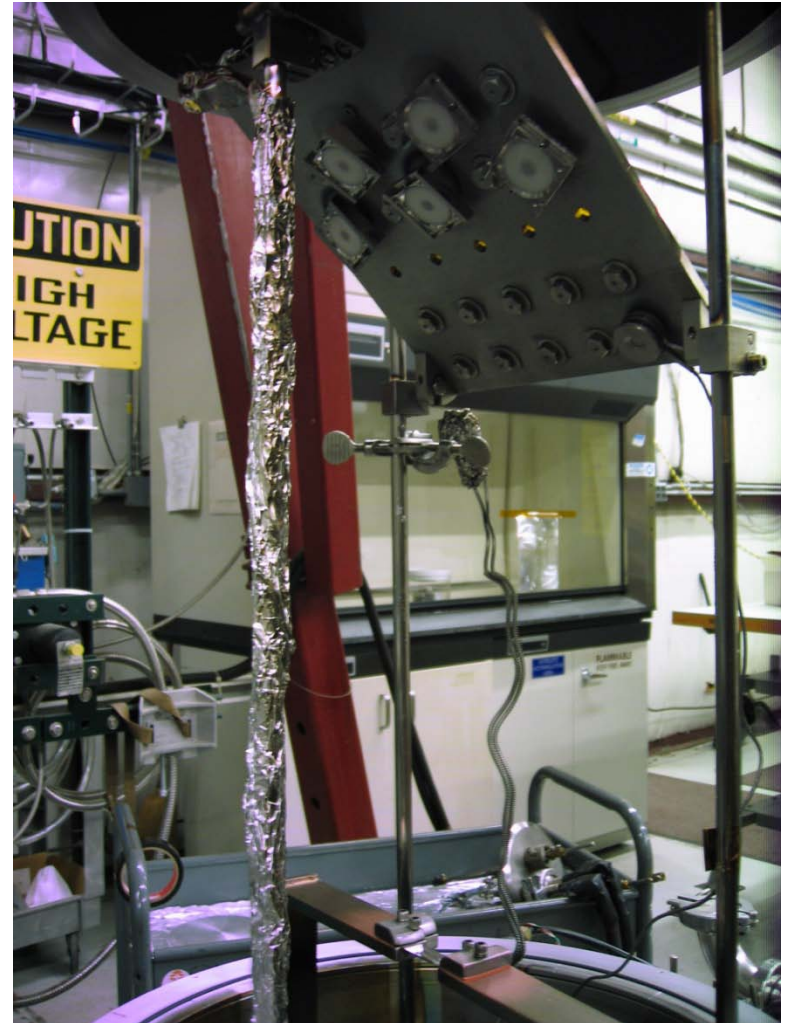
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Group Leader Thin Film Facility

9 December, 2011

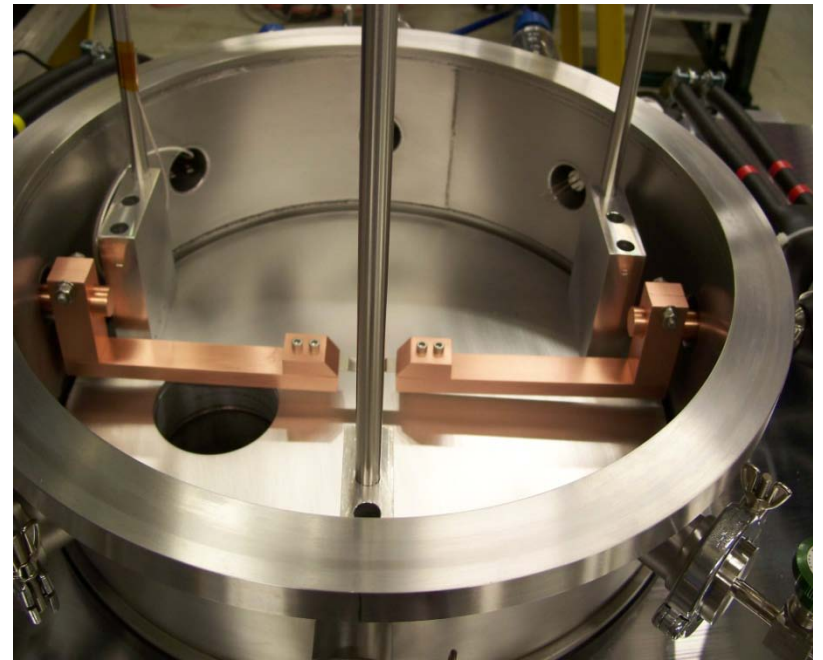
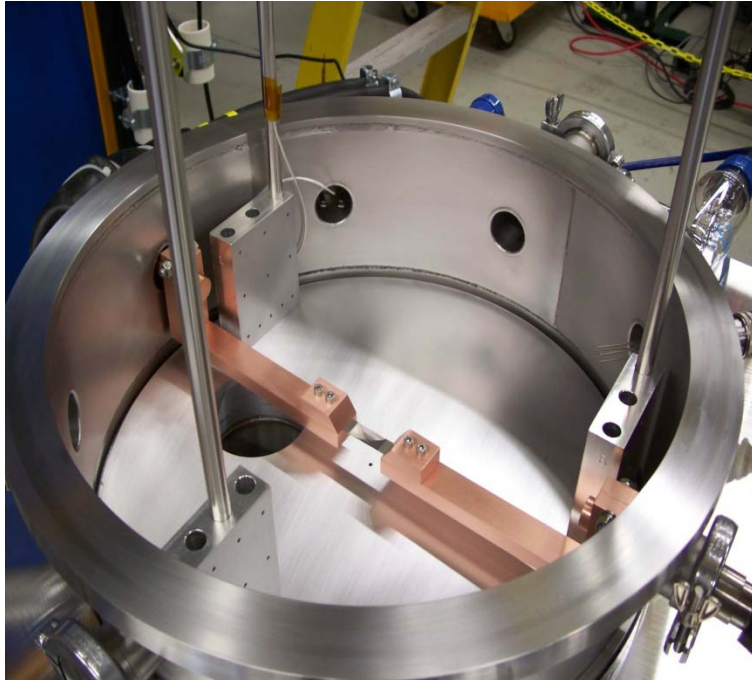
NiCr “electroding” of 33mmDIA MCPs at Lab 7

- Have coated more than 120 of the 33mm disks to date
- Resistive evaporation of NiCr 80/20 (99% pure) in W boat
- Vacuum low -6 to high -7 TORR achieved with overnight pump
- 151l/s molecular turbo pump & dual rotary vane roughing pump
- Coating current 250Amps
- Actual evaporation time <20 minutes
- Rotation speed 30rpm
- Direct geometry rotation distance is 18 inches from boat to center of holding plate
- Quartz crystal thickness and rate monitoring



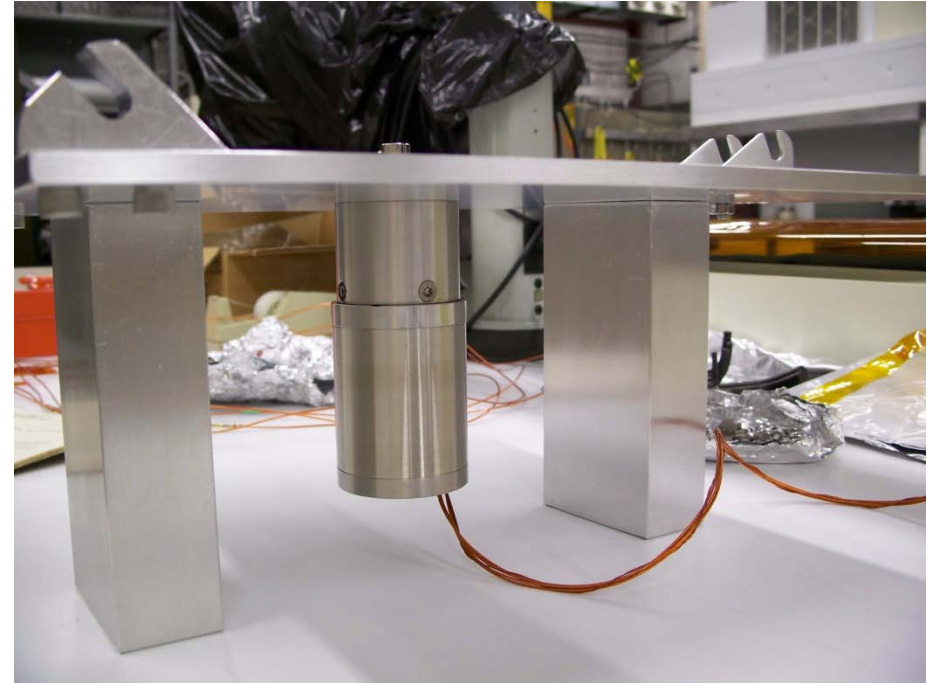
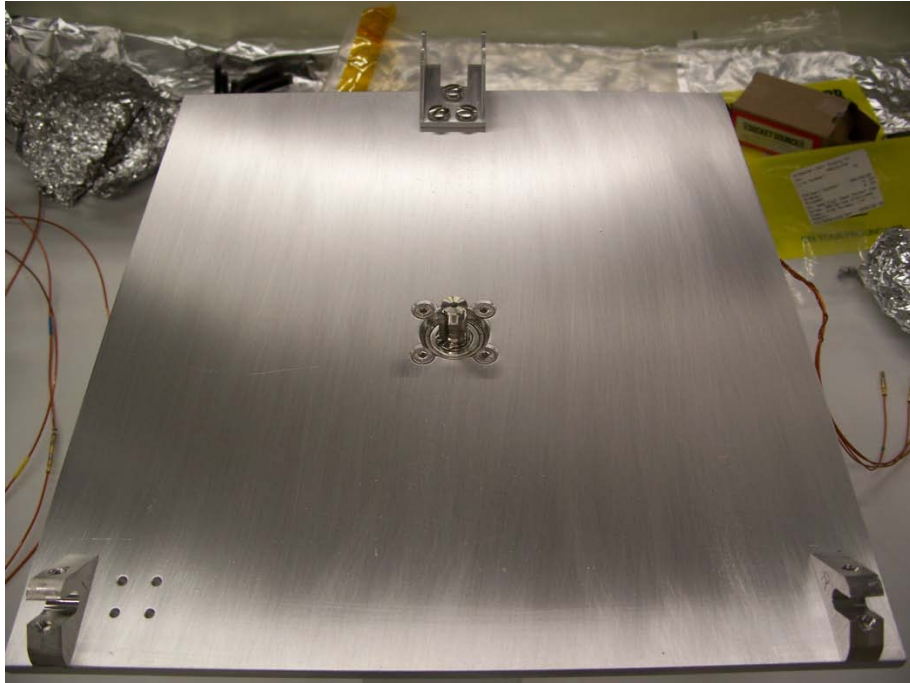
Internal parts completed

Copper electrical feeds installed



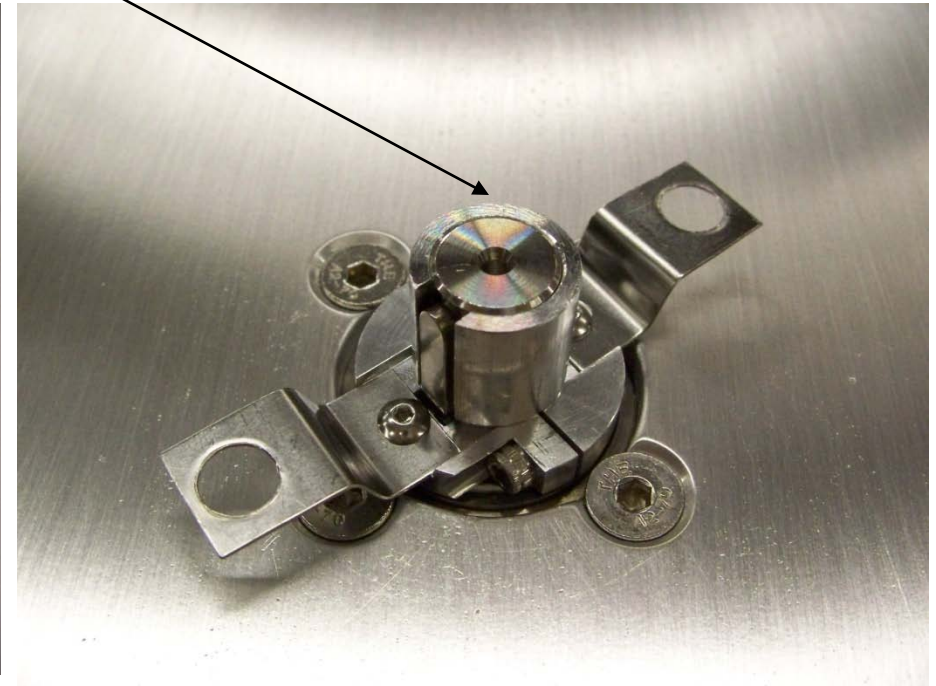
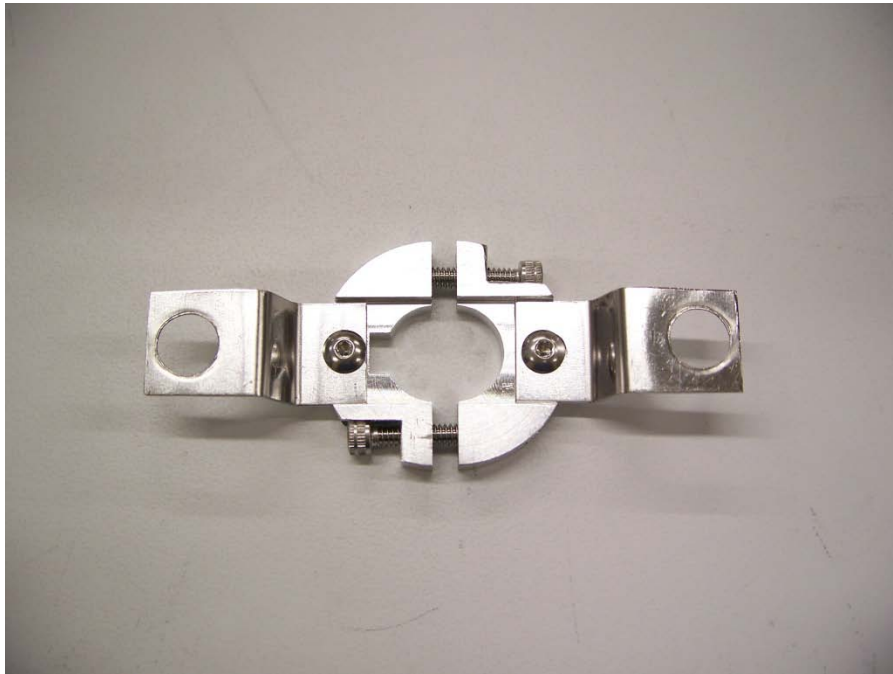
Holder Plate completed, cleaned, and motor mounted

- UHV stepper motor VSS 57.200.2.5 VG 8:1 ratio - 4 leads



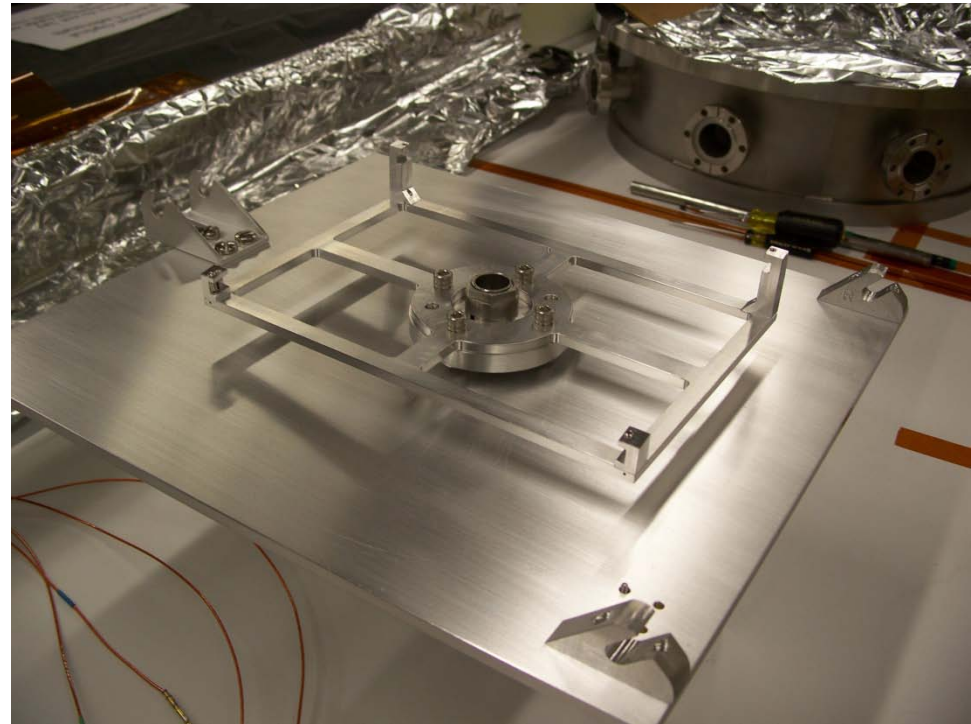
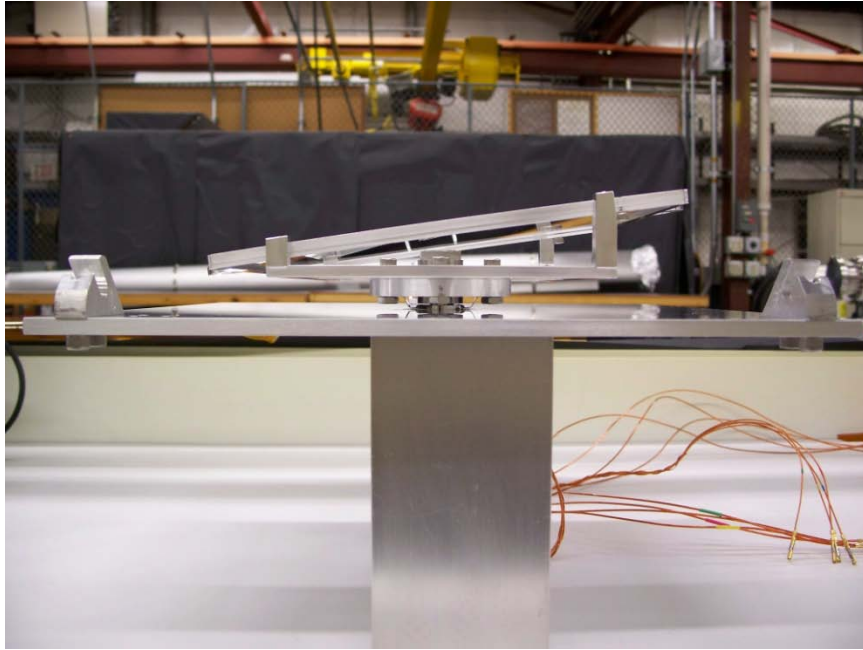
Safety Retainer designed, fabricated & installed

Safety retainer & spacer for bushing clamp installed on motor shaft



Holder plate and MCP base fixture assembled

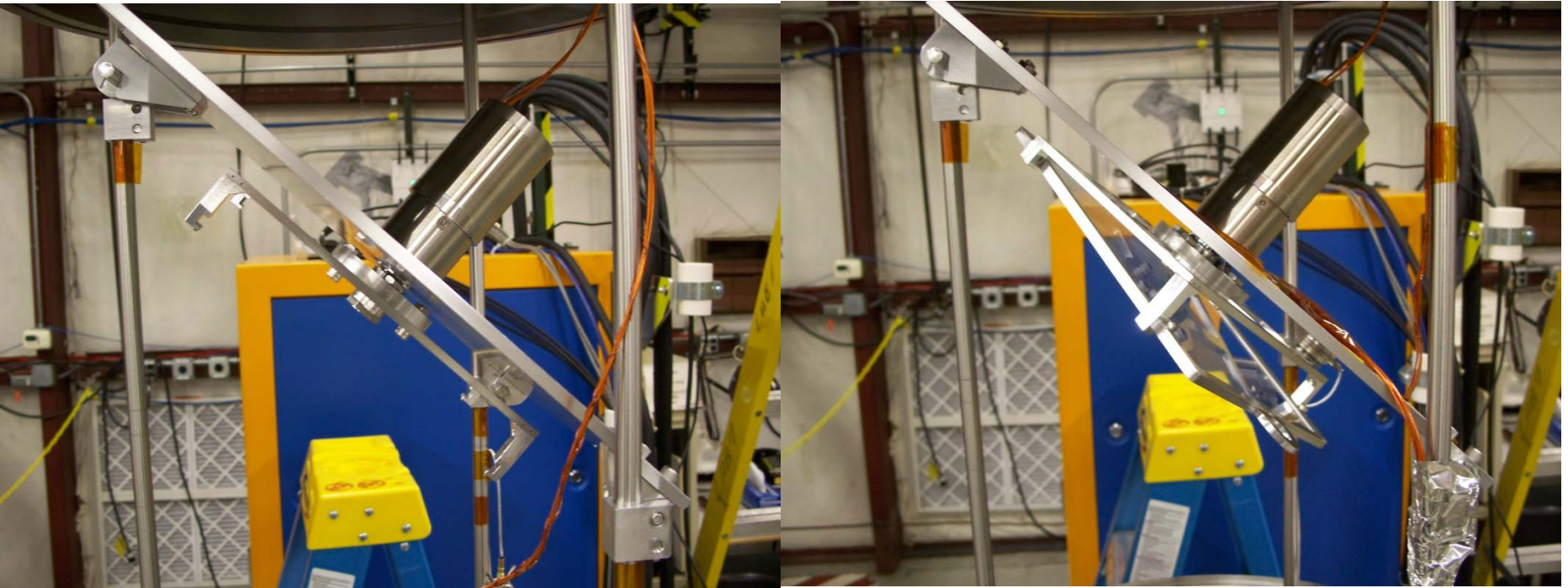
Everything fits!!!



Motor Assembly and Holding Plate in-situ

Assembly with MCP base fixture

Assembly with MCP frame & glass



6 speed choices-1 rpm, 3 rpm, 5 rpm, 10 rpm, 15 rpm, 30 rpm & an analog dial

Total view of system with top bell open for mounting MCP frame



Tasks still to complete

- Complete installation of internal motor wiring
- Testing of motor rotation & adjustment of voltage inputs (controller was set up with another motor)
- Testing of coating on several 8inch glass substrates to fine tune operation (initial tests to be at ~6 rpm)

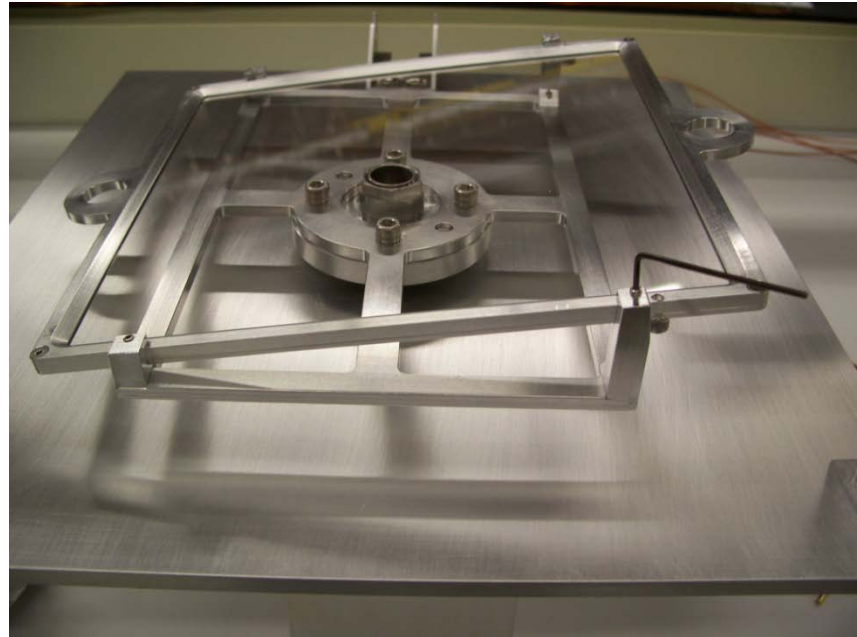


8inch MCP coating system specs

- Total height of 8 port MDC collar plus Fermilab fabricated “extension collar” plus 30”MDC bell jar = 65 inches
- Internal working diameter = 17 inches
- Volume of chamber ~ 10 cubic feet
- Distance from boat to substrate center = 51 inches

Concerns in production

- Small screws that clamp MCP frame to MCP base fixture-close attention needed to prevent screws falling out. Review design of capturing the frame.



Potential schedule of commitment and rate for production of 8inch MCPs “electroded”

- January 2012
- 1 MCP per week
- Training 2 other persons to perform coating-install MCPs-monitor system
- Under current setup-potential output can be 5 MCPs every 2 weeks.

