Transfer Photocathode

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Goals

PMT
Photocathode

4”x4”
Photocathode

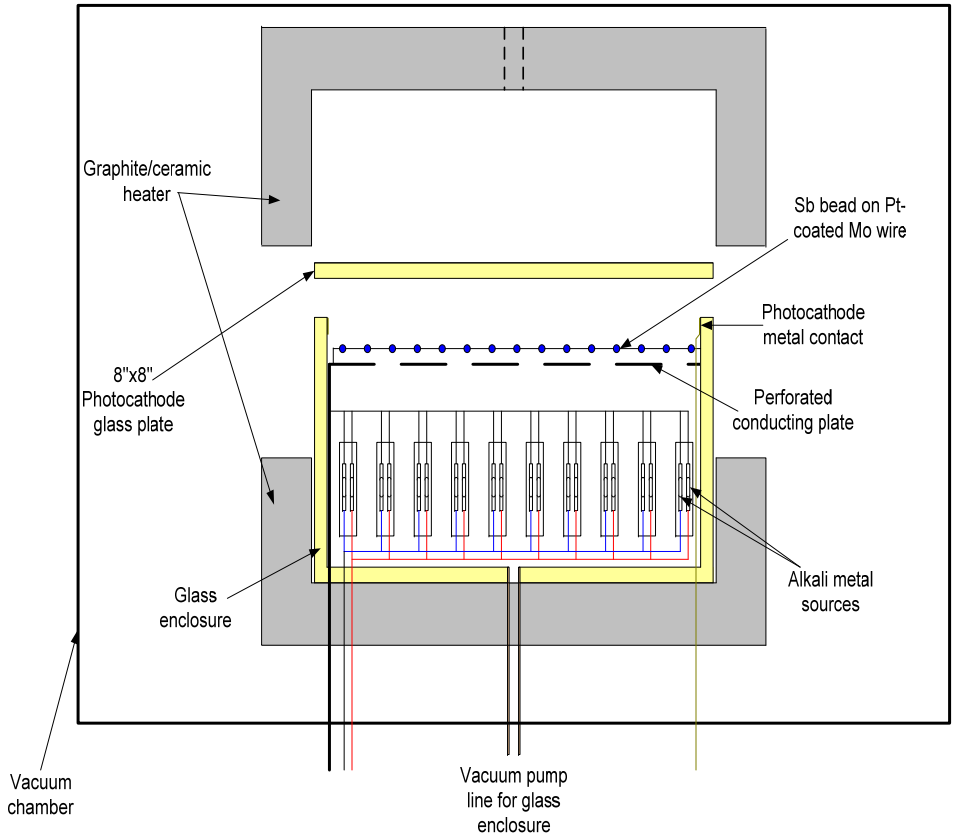
8”x8” Photocathode

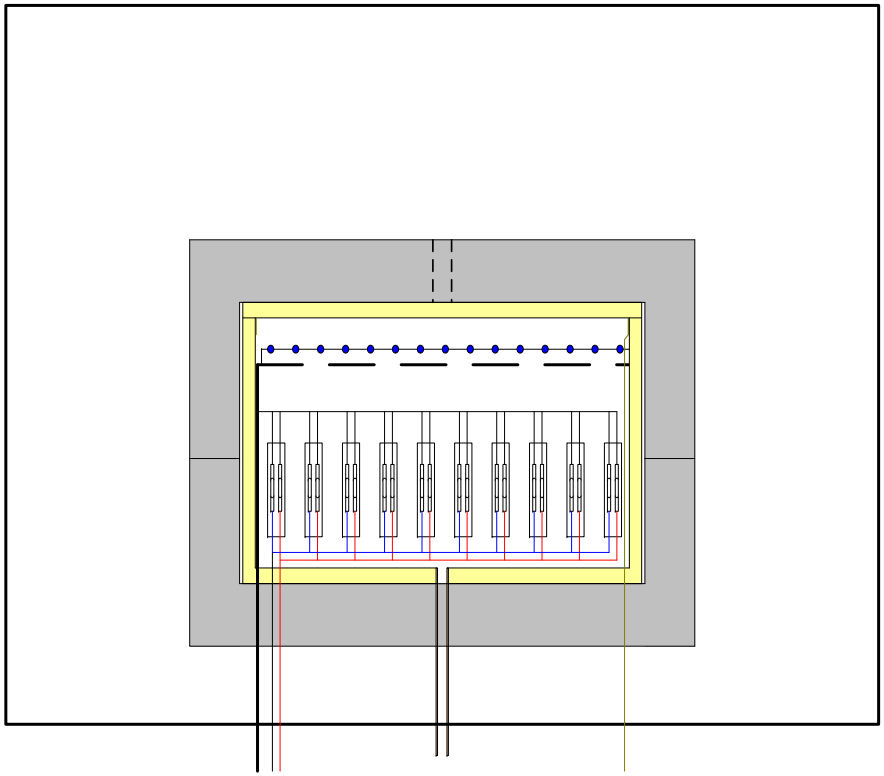
Lessons Learned From PMT Photocathode Fabrication

- Substrate cleaning procedure. Rudimentary cleaning for normal UHV components (Liqui-nox, alcohol, etc.). Bakeout duration and temperature;
- Oxygen discharge cleaning before Sb deposition;
- Oxygen discharge oxidation of first Sb layer to enhance long-wavelength absorption;
- Optical reflectivity monitoring of Sb layer to determine thickness;
- Alkali metals deposition in glass vessel – using vapor pressure to flood the chamber alkali metal vapor – no line-of-sight issues;
- Monitoring of photocurrent during alkali metals deposition – when to stop.

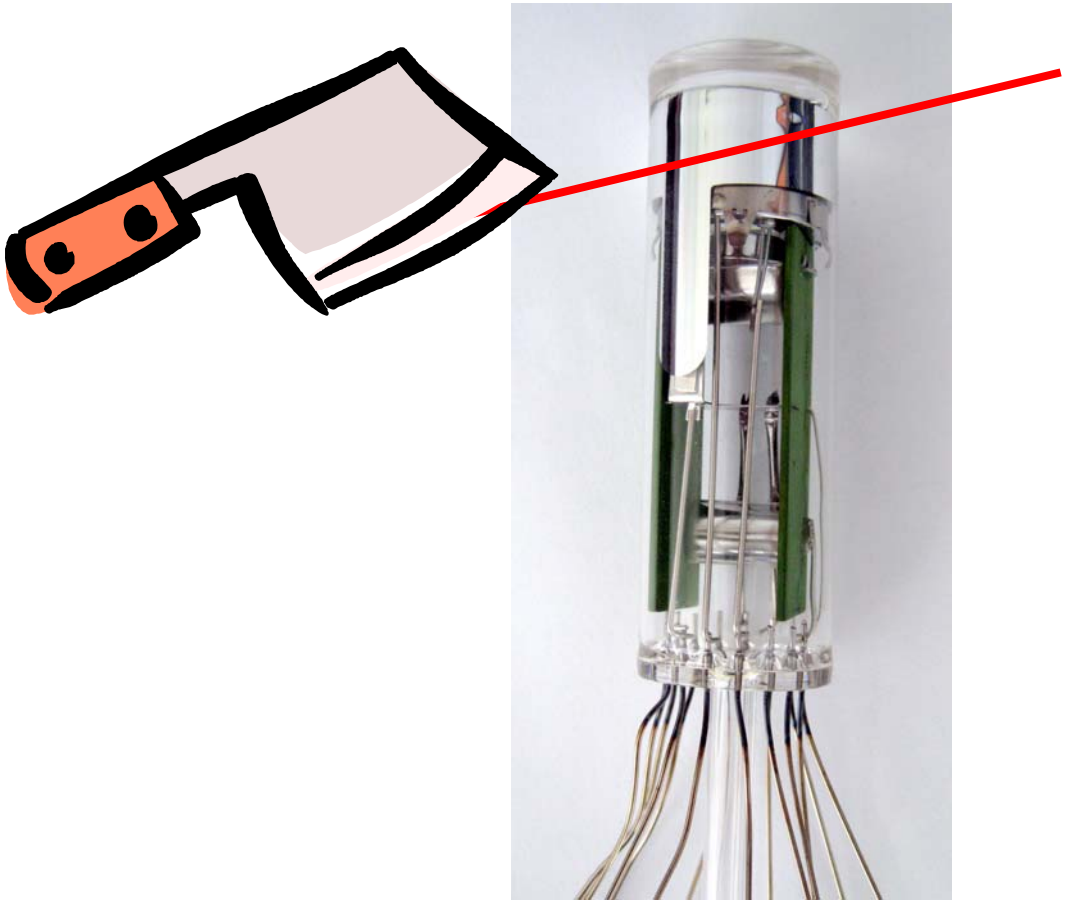
But can these lessons be transposed to a larger, transfer photocathode?

Current Ideas for 8”x8” Photocathode Fabrication (shown during last GP Review)





Configuration when closed for photocathode deposition

Can A PMT Photocathode Be Transferred in Vacuum? First-Order Test

- Break, in vacuum, a PMT tube that contains a photocathode;
- Check QE;
- This can be done in an existing vacuum system;
- If this is successful, go directly to the glass structure to make 8”x8” photocathode? Or do we need an intermediate step (chalice equivalent)?
- If not successful, what happened? Does the Cs partial pressure linger in the PMT tube to help preserve the QE?