



HOUGHTON
UNIVERSITY

DEPOSITION SYSTEM FOR THIN LITHIUM NUCLEAR TARGETS

Chunsun Lei

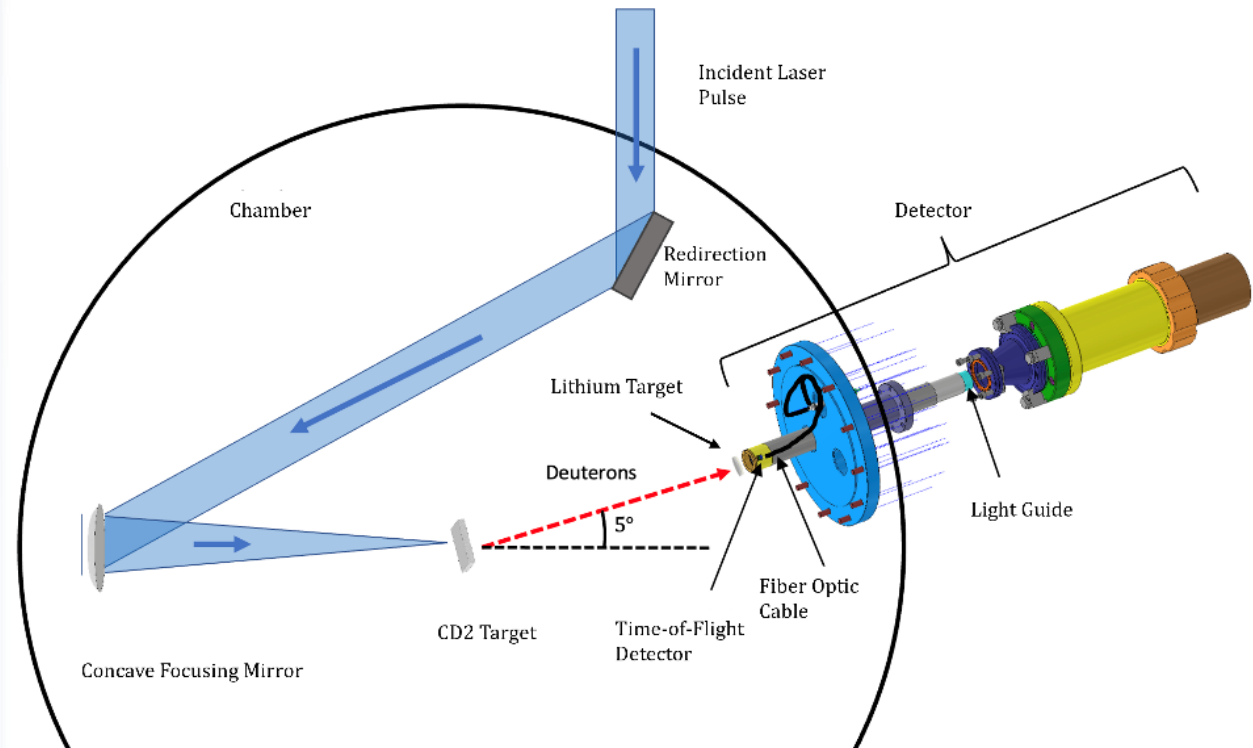
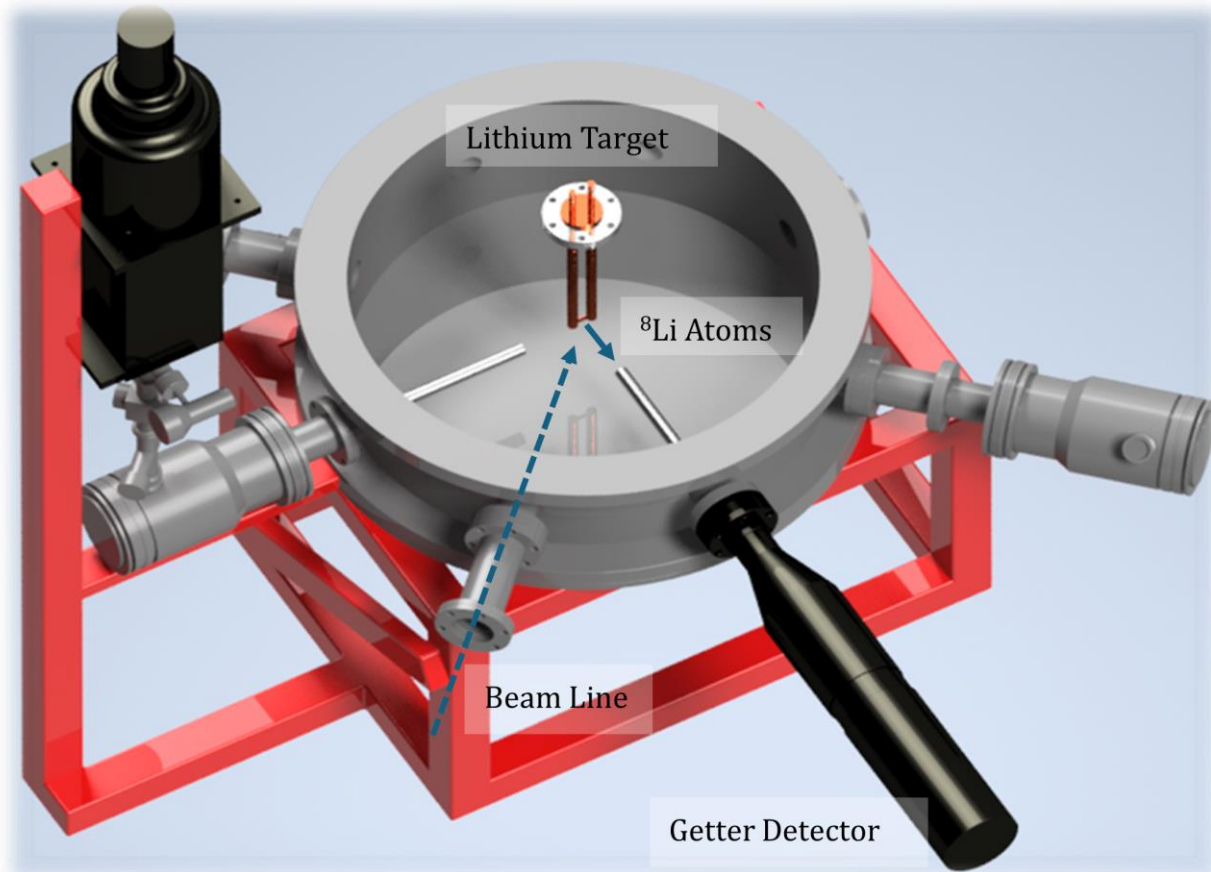
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April 20th, 2024

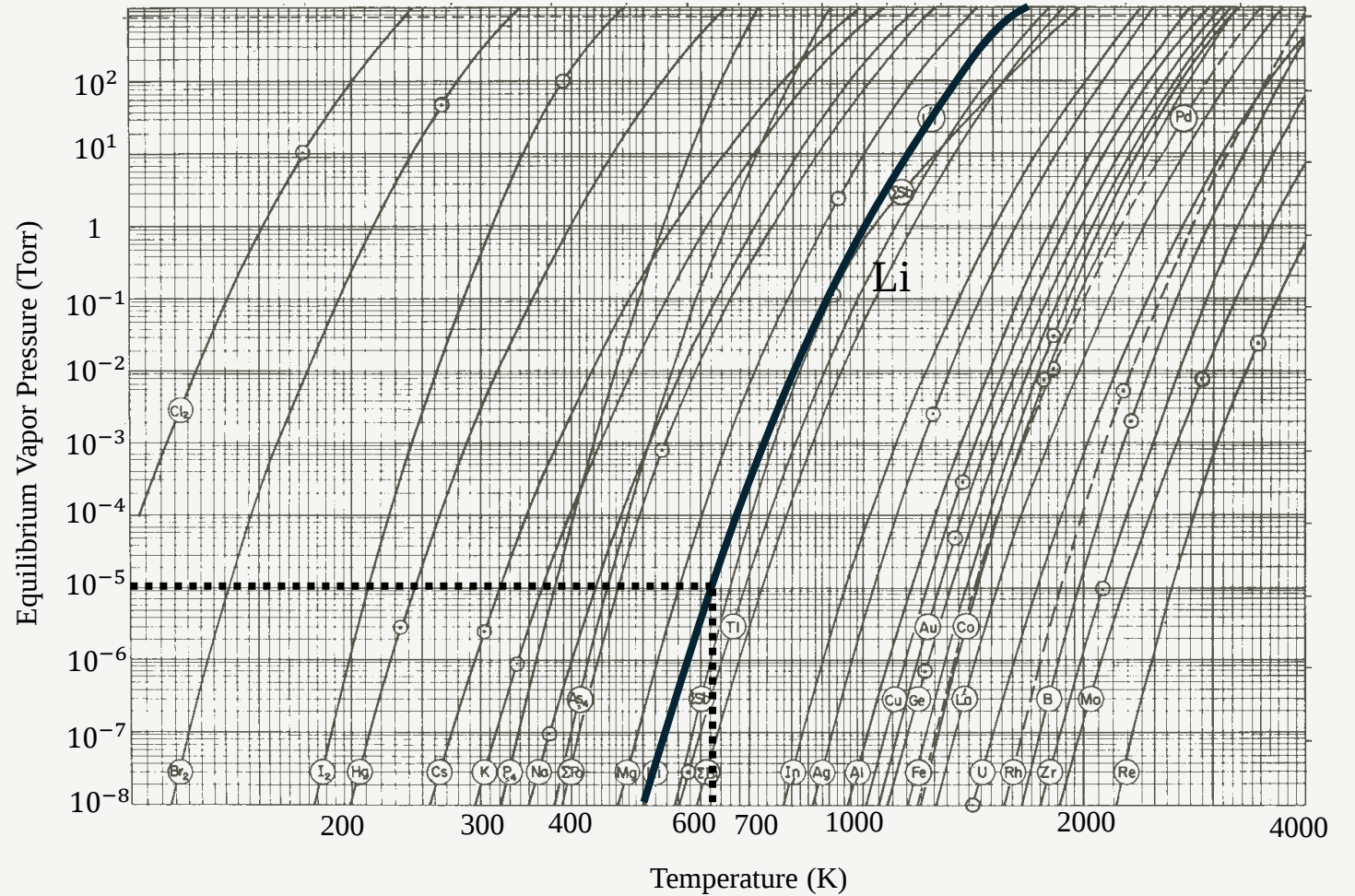
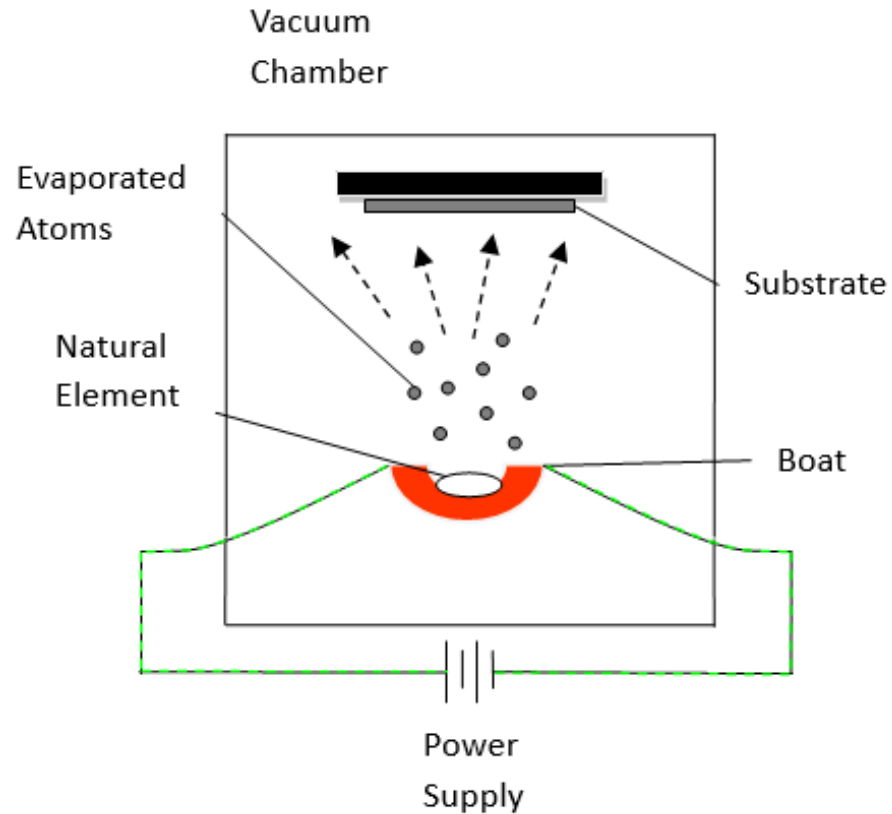


Thin Film Target For Nuclear Experiments



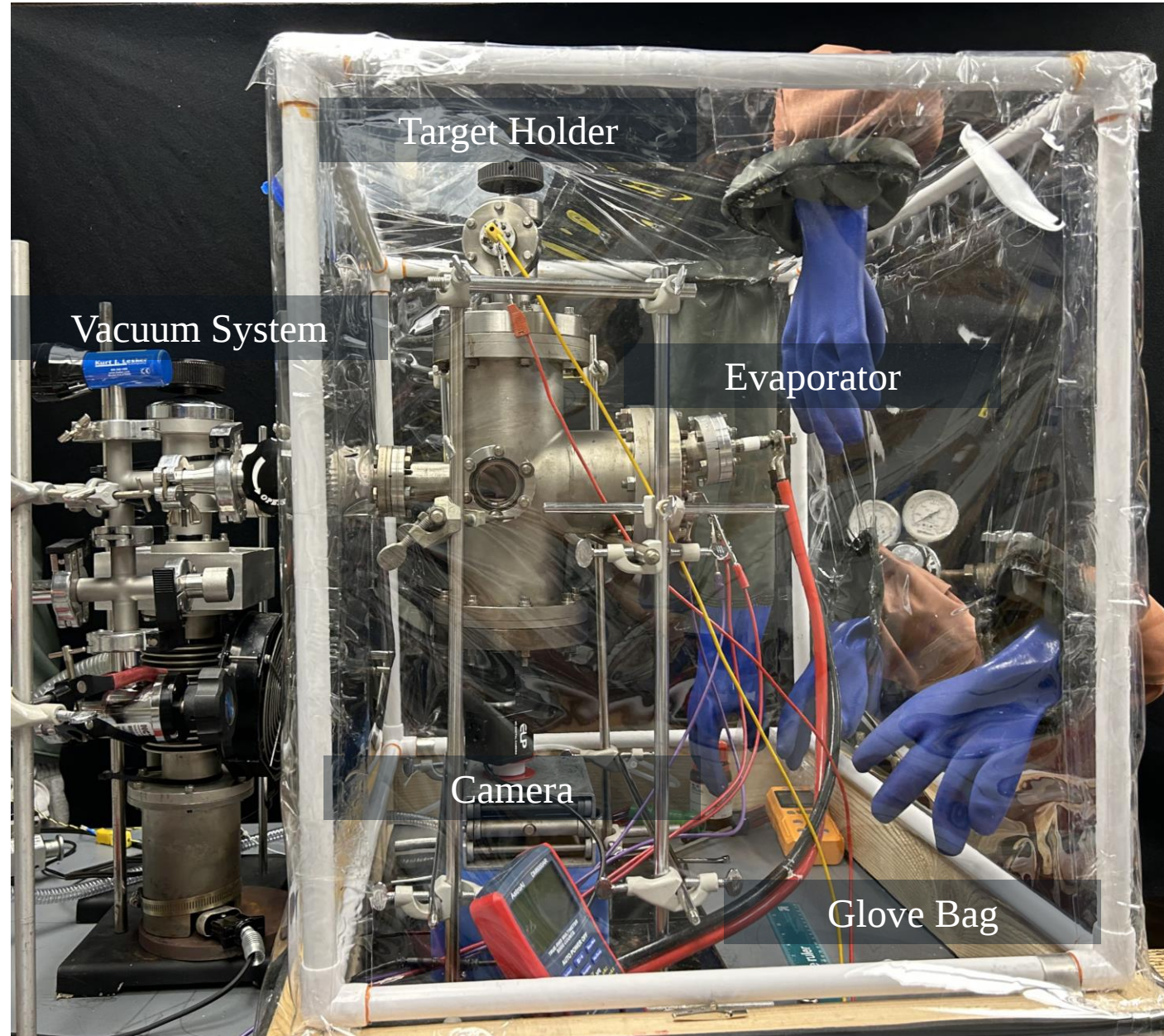


Physical Vapor Deposition

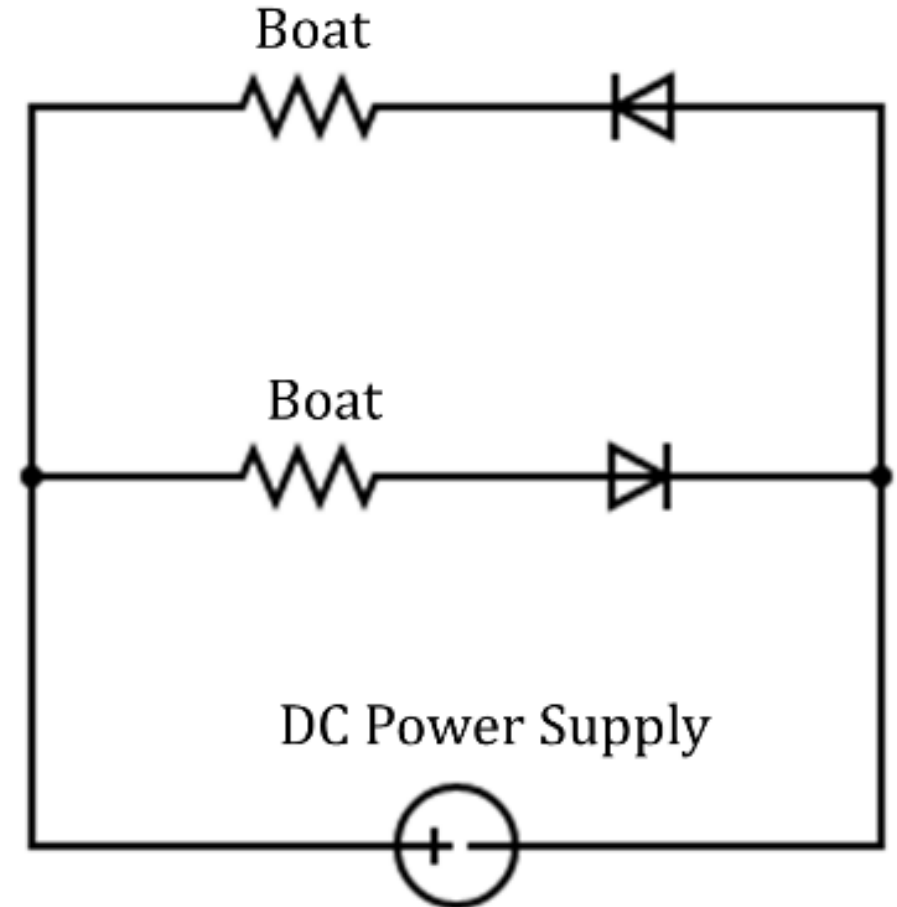
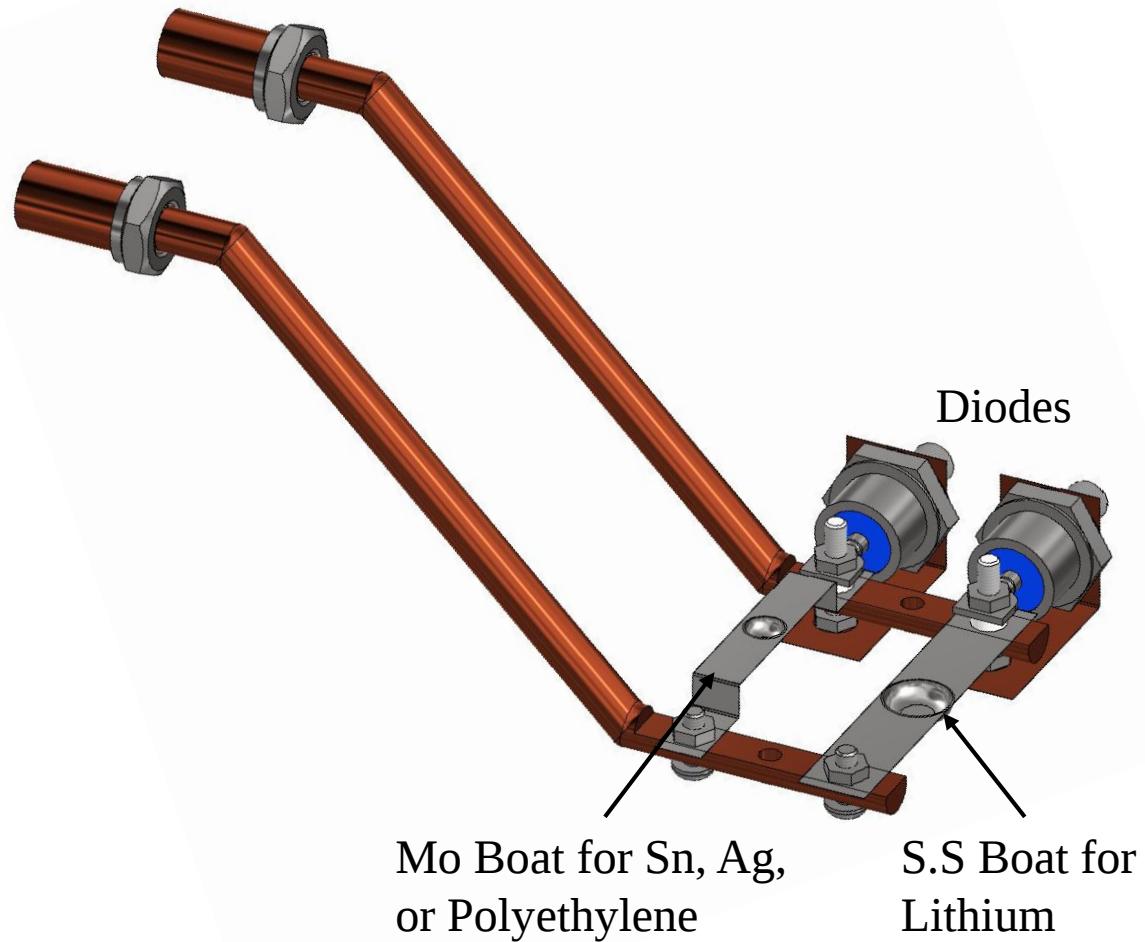




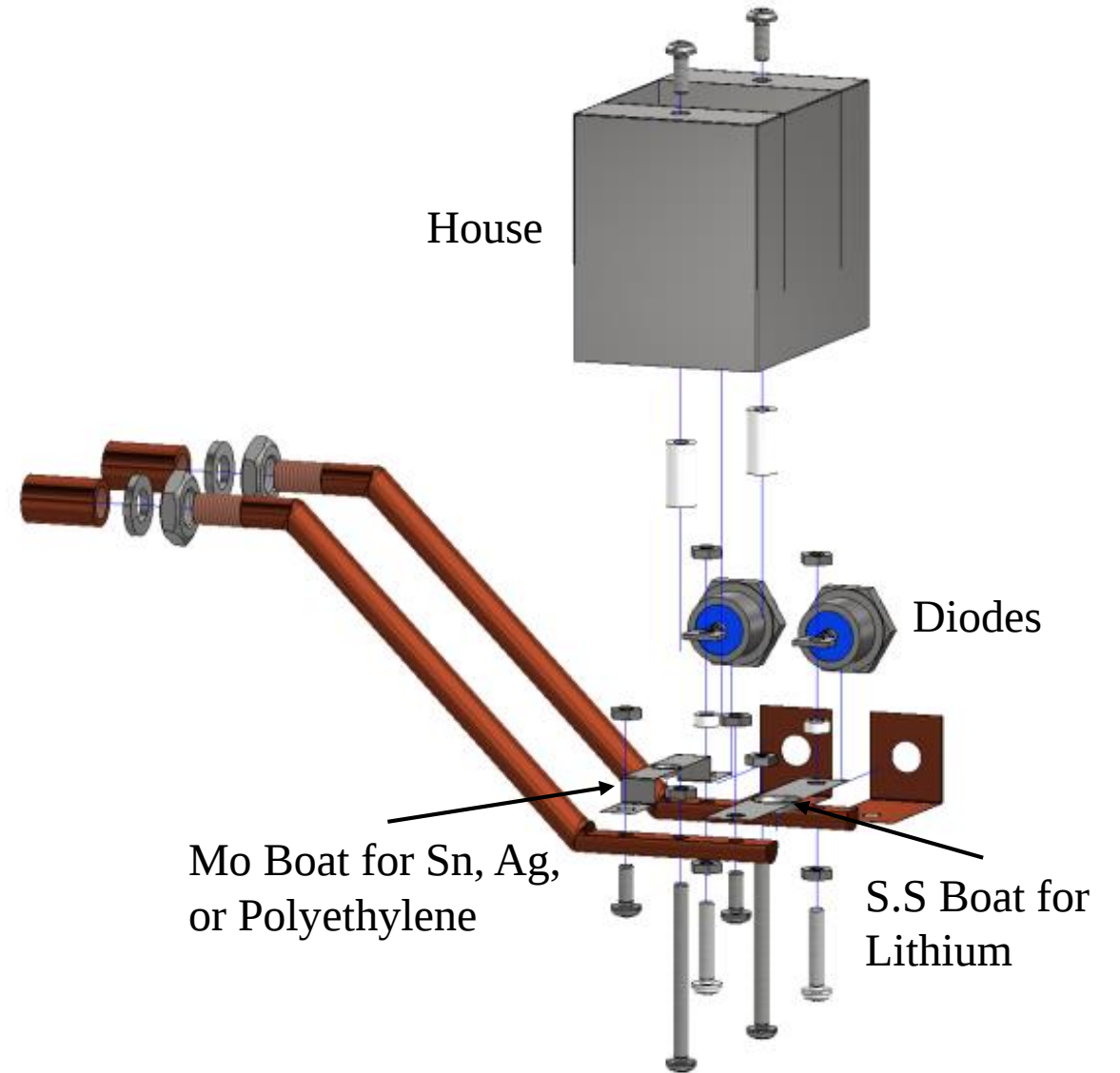
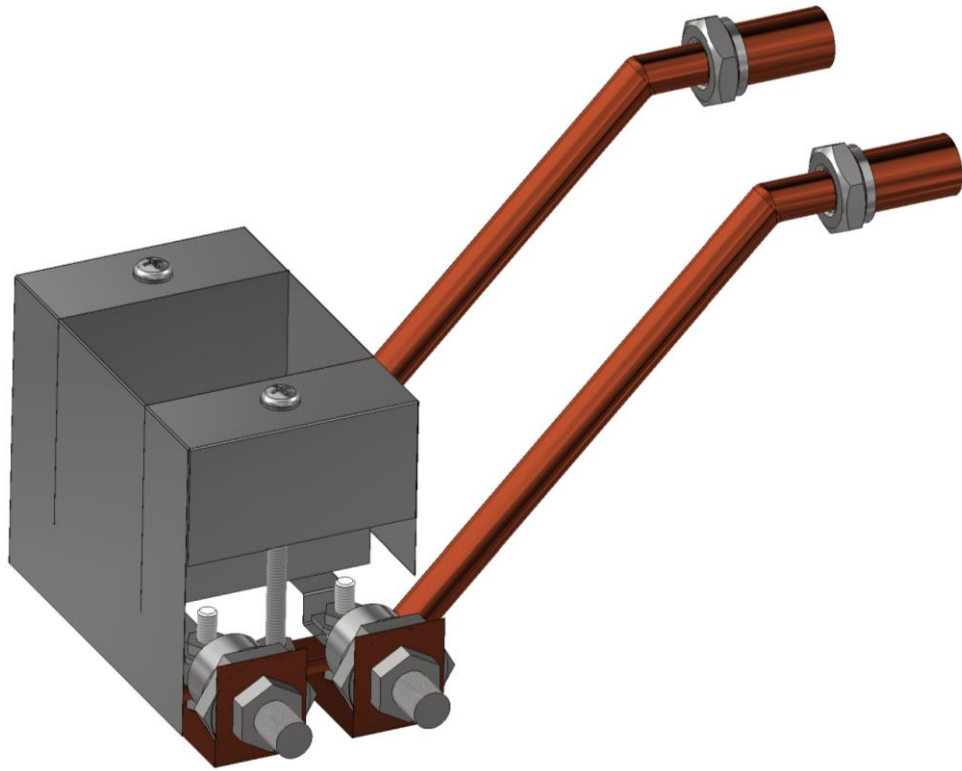
Deposition System



Evaporator



Evaporator



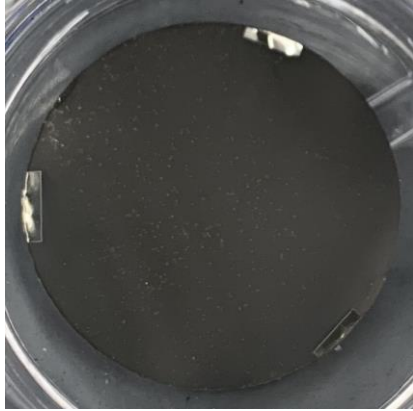
Deposition Process



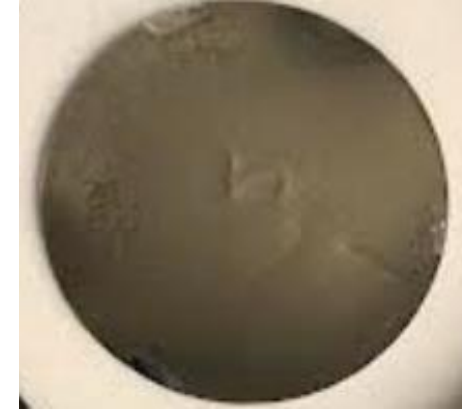


Lithium Films

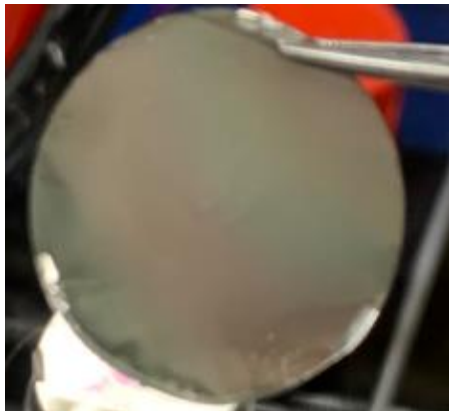
Uncoated Li Film



Sn coated Li Film



Polyethylene coated Li Film



Ag coated Li Film



Issues observed

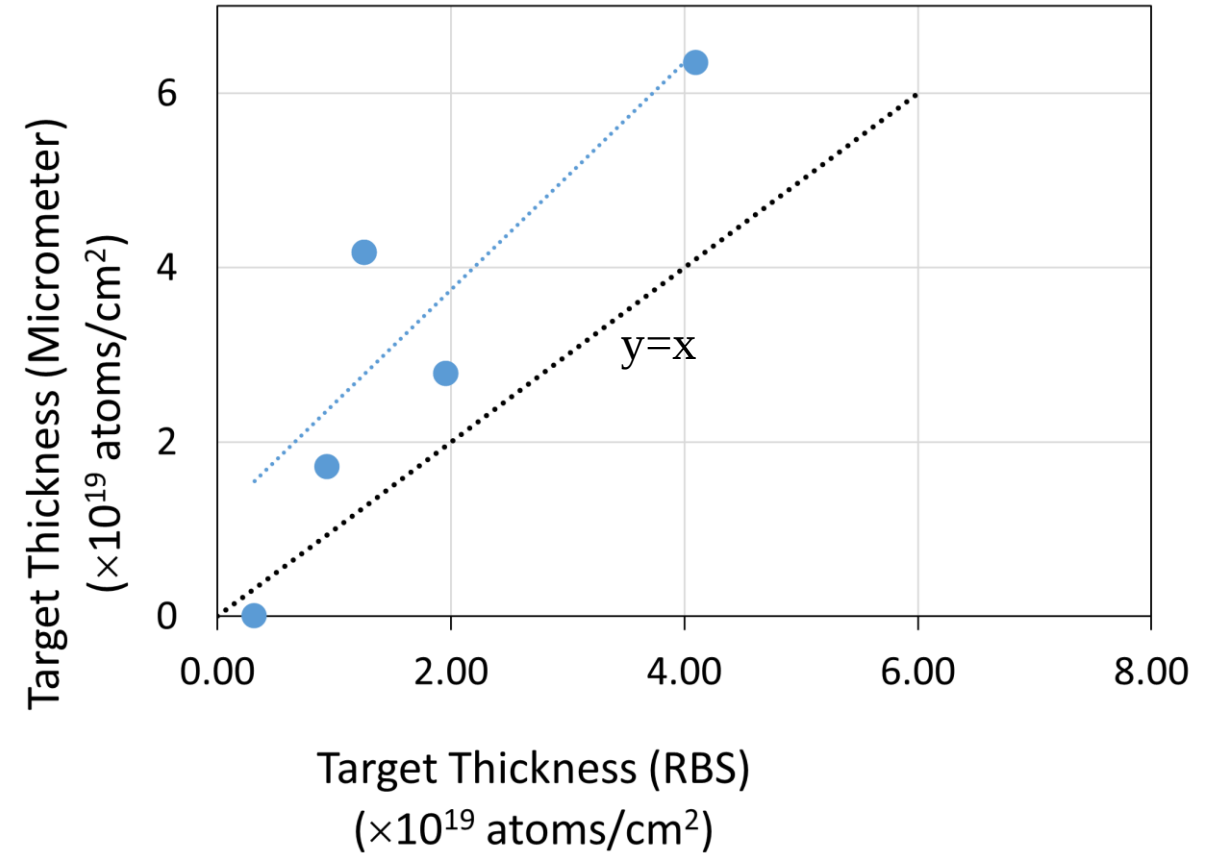
Cross-contamination and substrate overheating that caused the formation of alloy

Oxidization starting from the edge of the films

Non-uniform coating of film

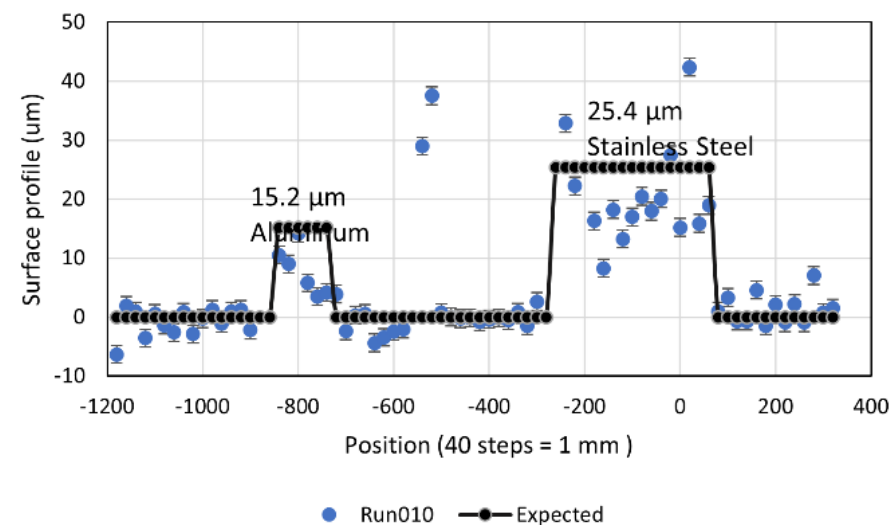
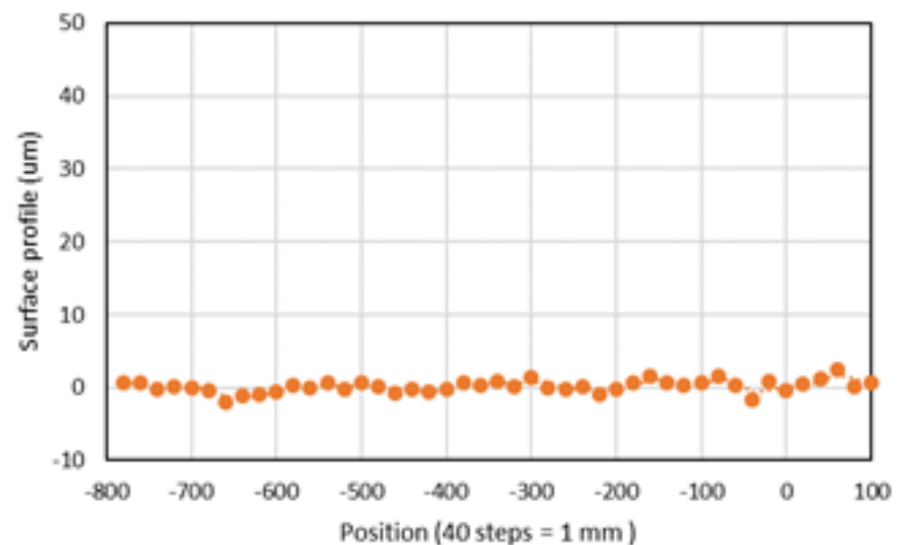
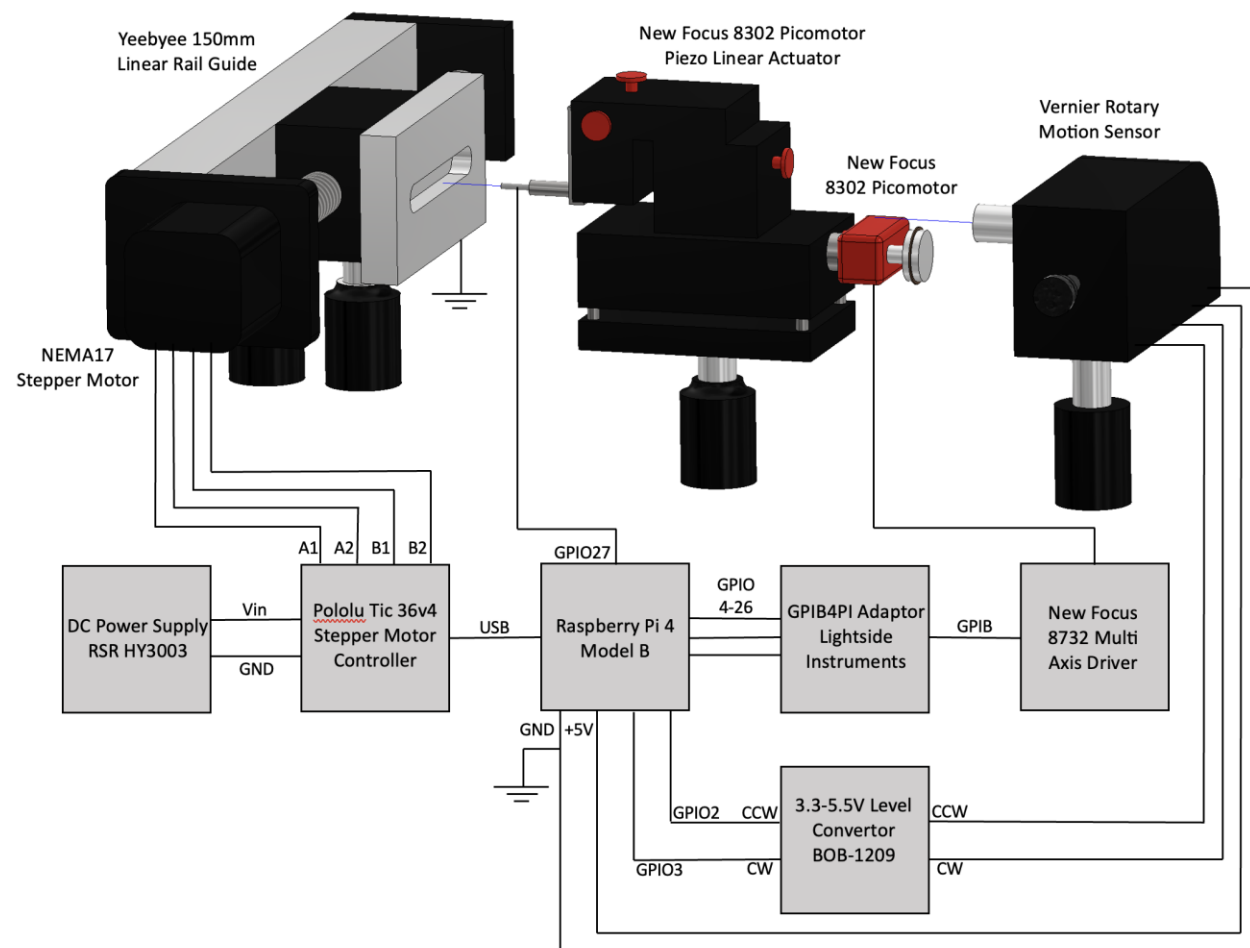
Thickness Measurement Methods

Method	Comment
Mechanical Micrometer	May cause scratching
Rutherford backscattering	May be used to measure thickness for different layers
Mechanical profilometer	May cause deformation and scratching.

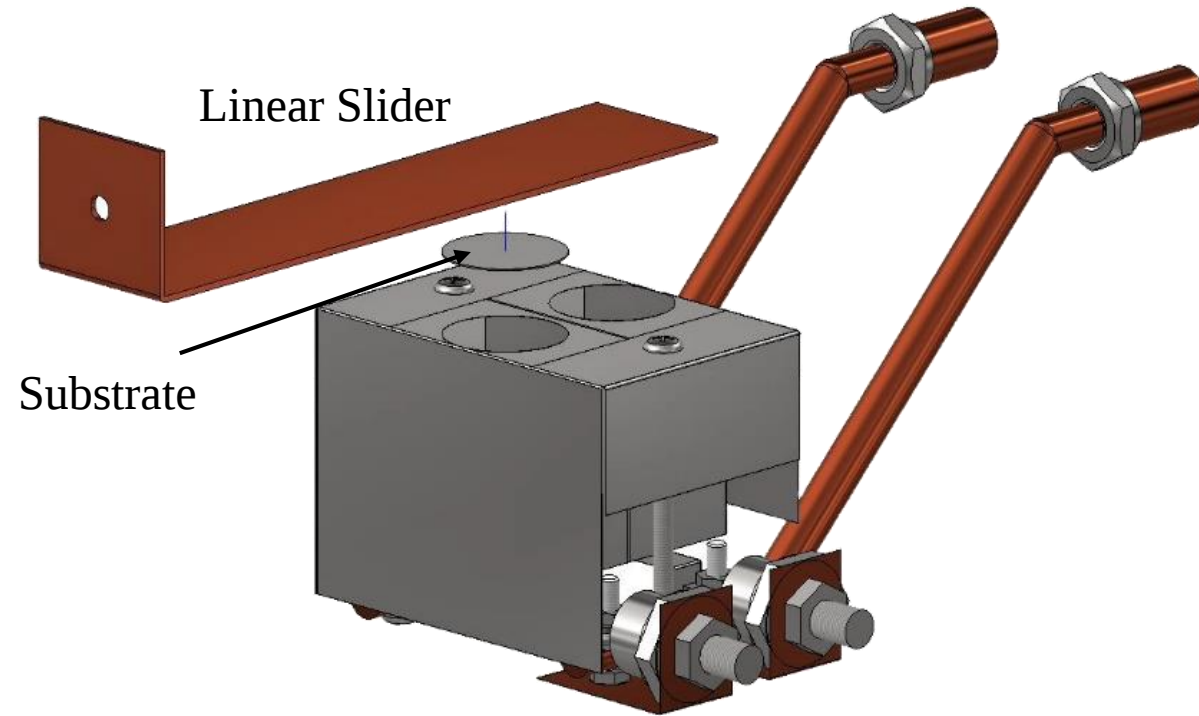




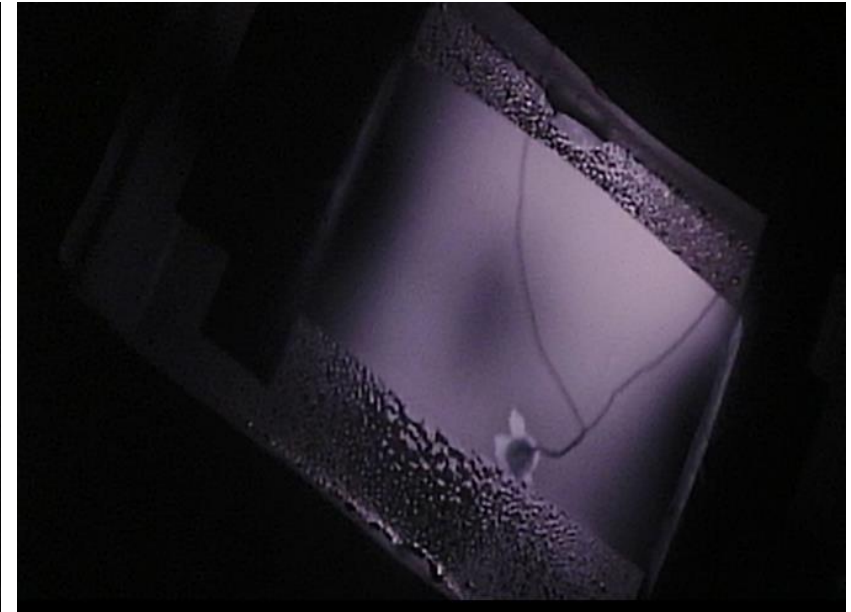
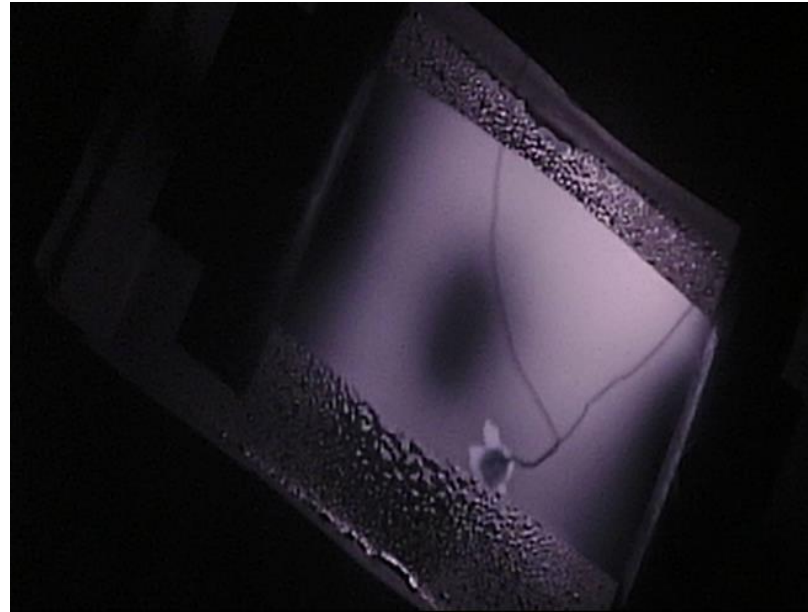
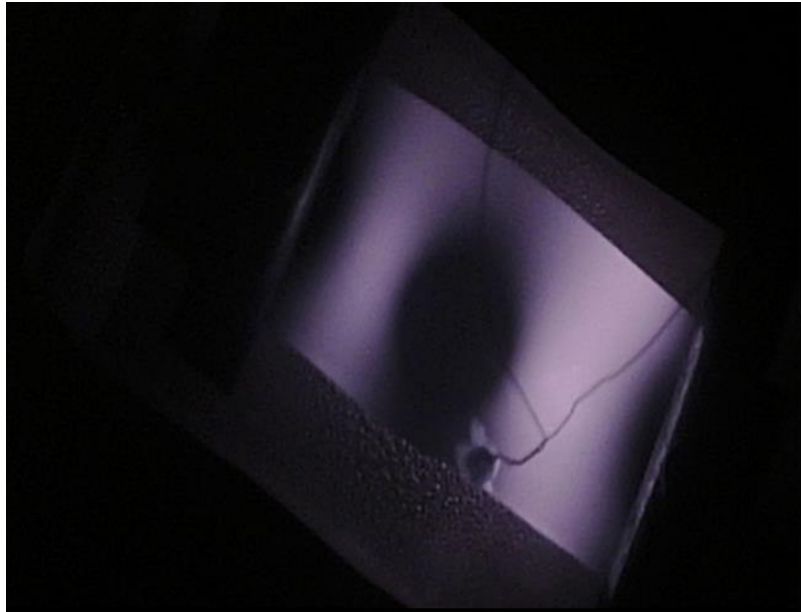
Profilometer



Future



Deposition Process



Deposition Process

