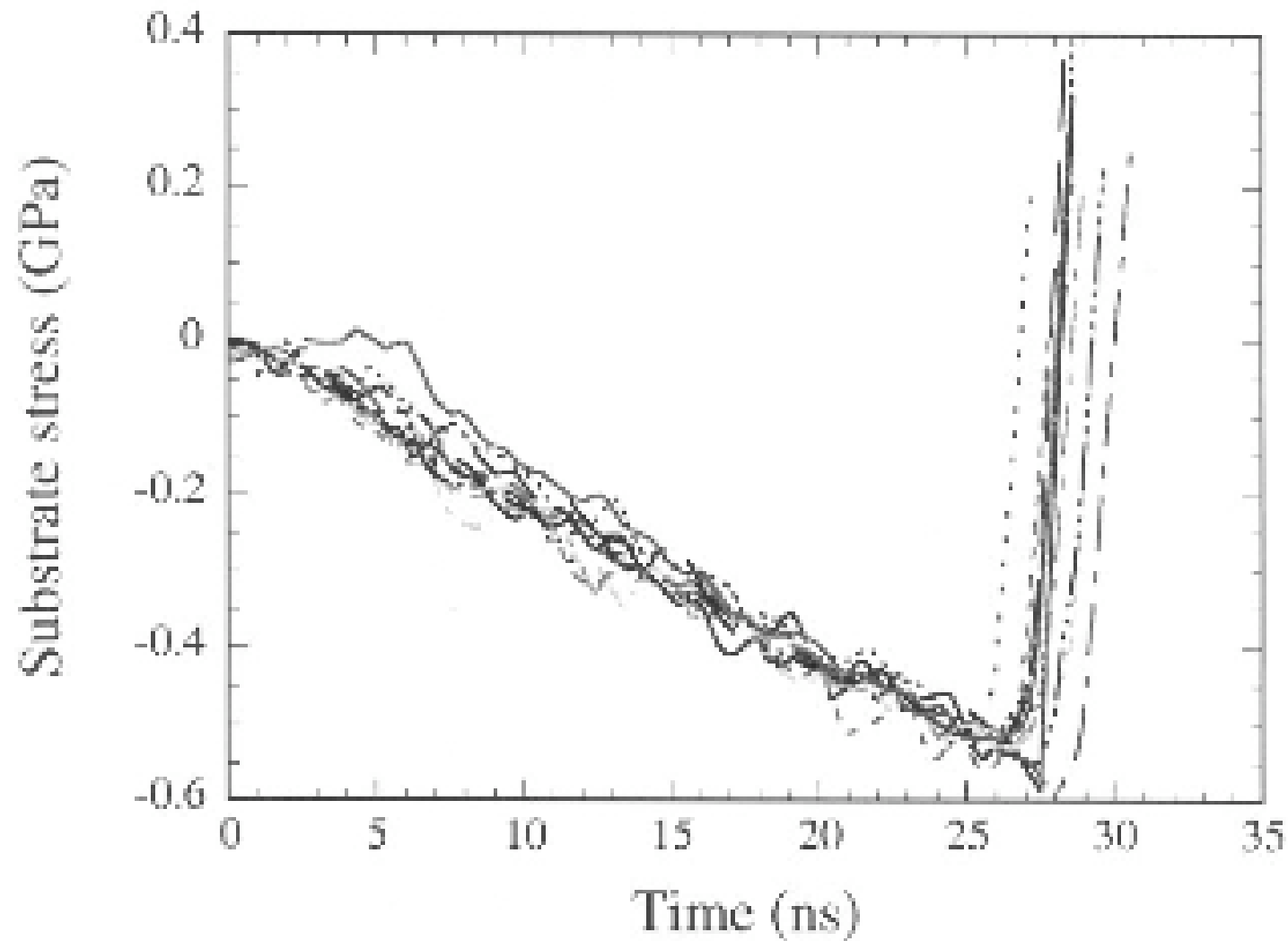


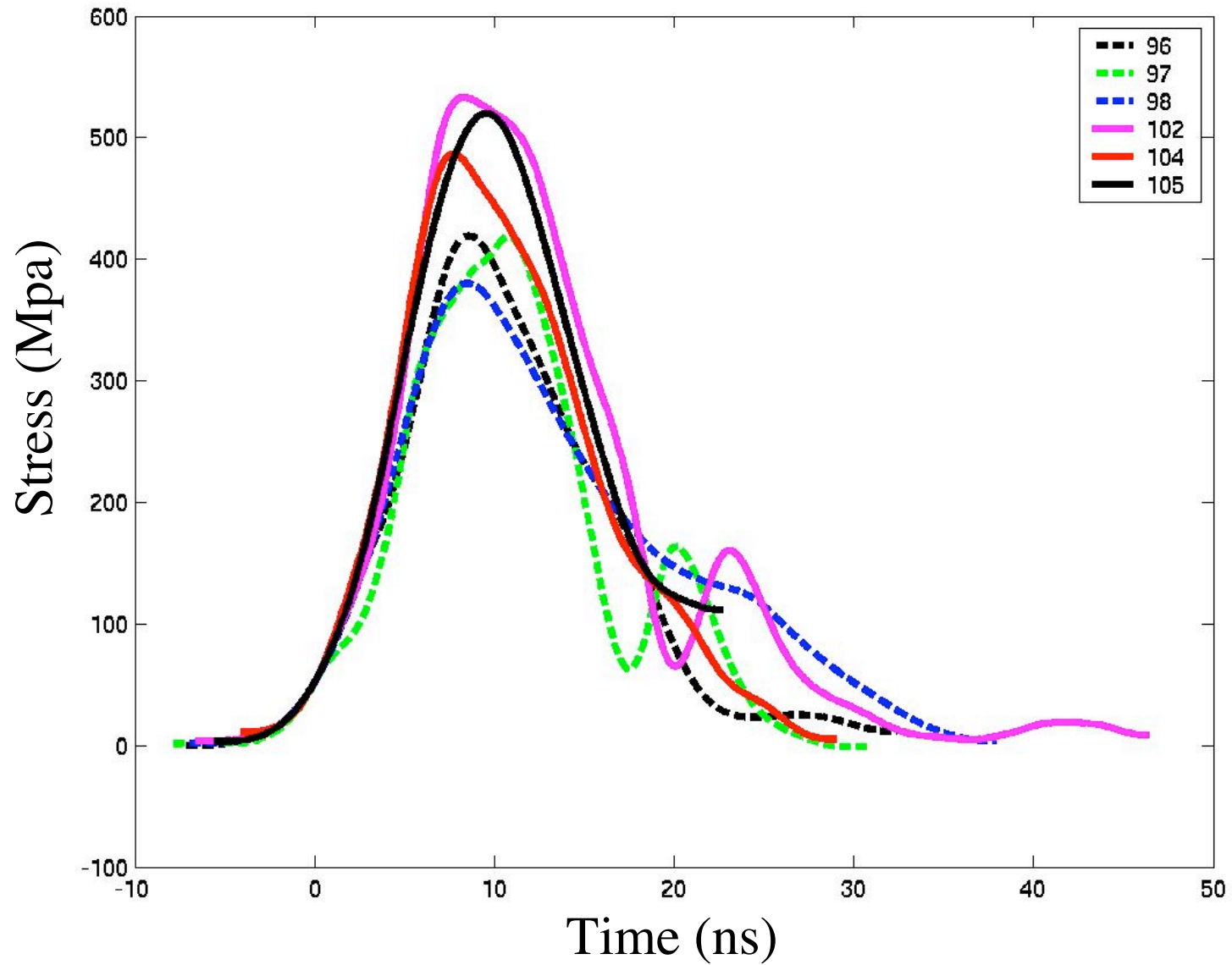
Waterglass Deposition

- Use a spin caster to deposit a uniform film thickness
- PDMS rubber mold creates uniform surface
- Spin speed and waterglass viscosity control layer thickness

Repeatability from Wang et. al.



Initial results, 17 μm coating

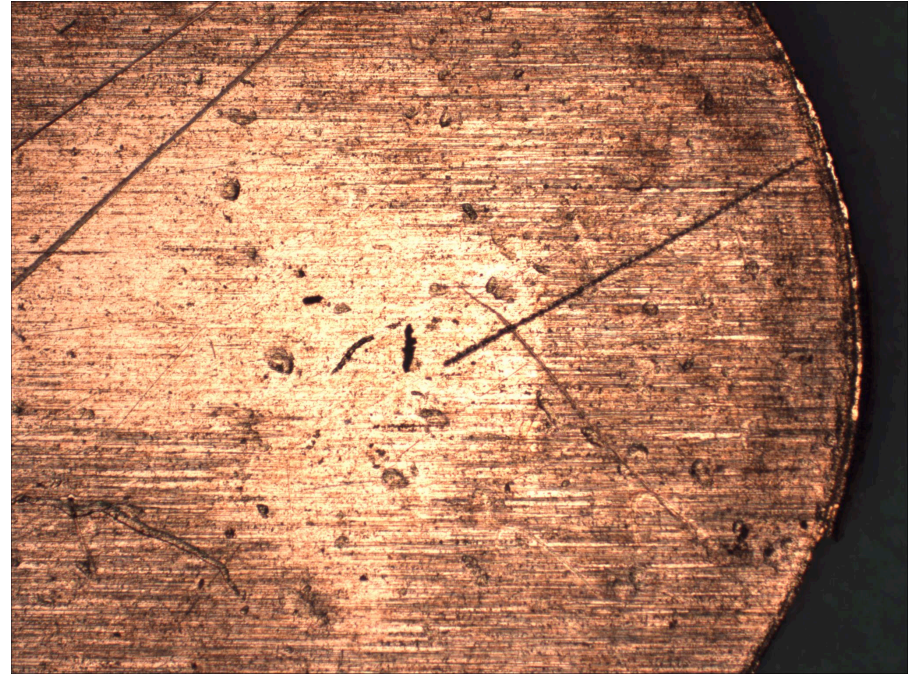
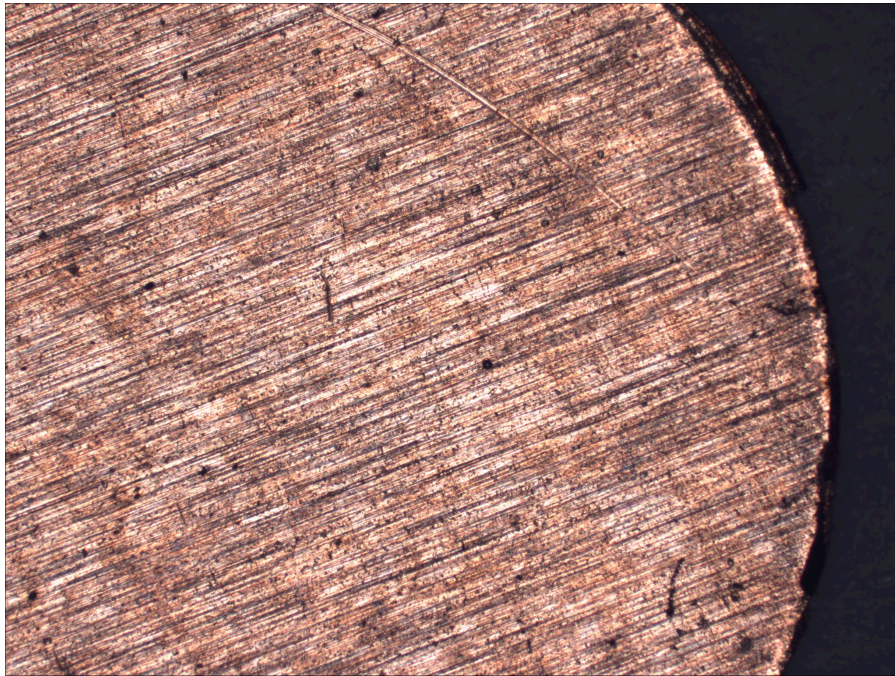


Copper Tests

- As-received rolled Cu sheet (150 μm)
- Annealed and polished Cu Sheet
- Single crystal Cu

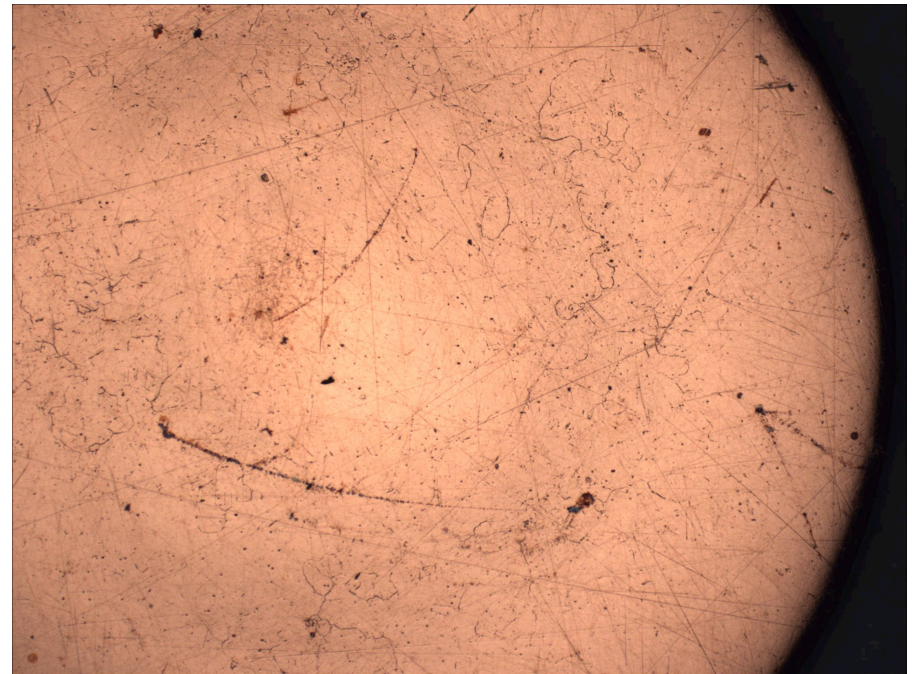
As-received Cu

- Sandwiched between polished Si
- Stress wave was not transmitted through specimen
- However, evidence of damage is present

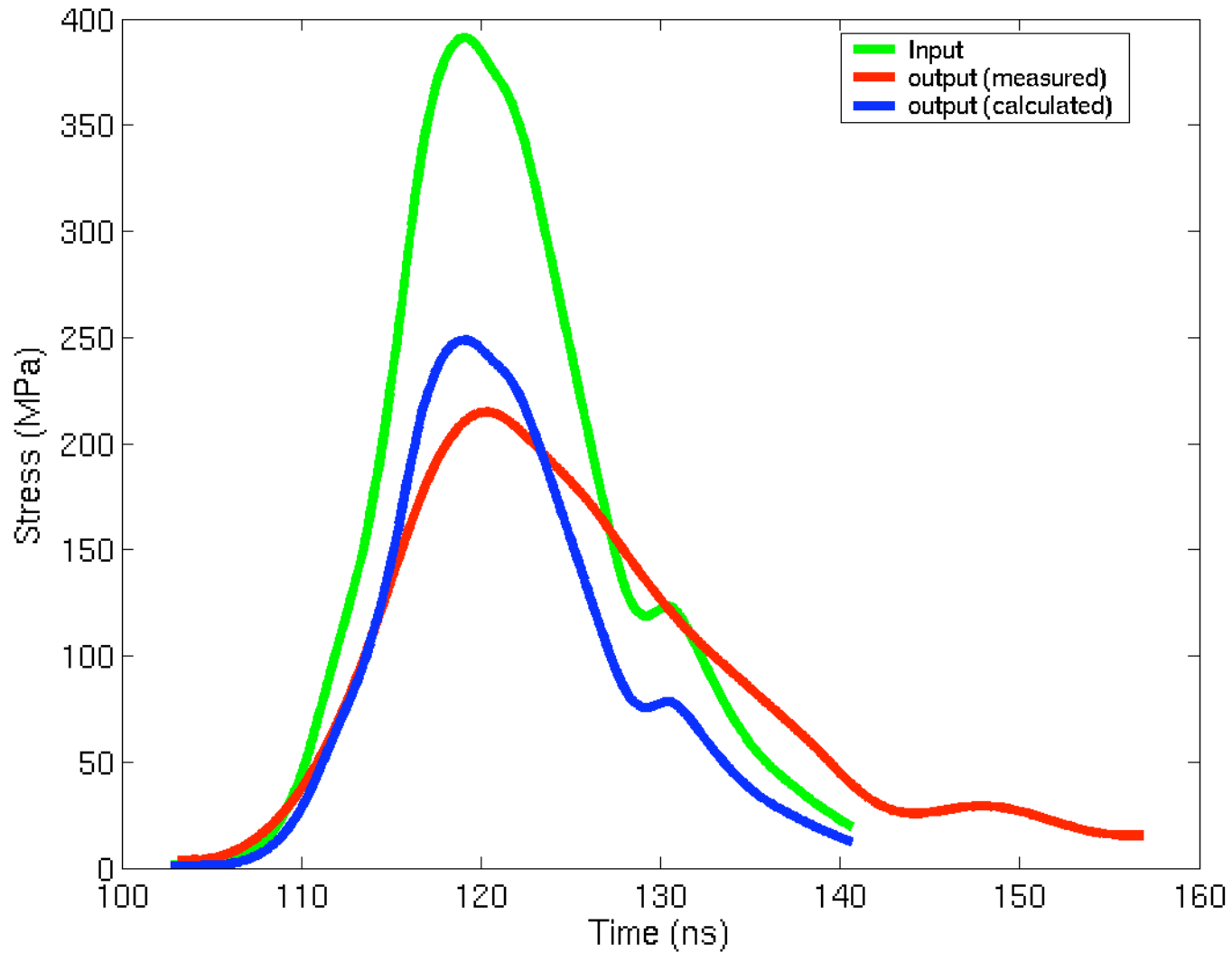


Polished Copper

- Sandwiched between polished Si
- Wave was transmitted through specimen
- No visible damage to specimen



Polished Copper



Single Crystal Copper

- Specimens cut from bulk crystal to have a $\bar{1}10$ normal.
- 150 μm thick, 4 mm x 4mm square
- Will be loaded at two stress levels
- May choose another orientation to facilitate twinning.

Semester goals

- Improve repeatability of waterglass coating
- Calibrate stress pulses for given fluence/coating
 - May need to calibrate each batch
- Test Cu (poly and single) at high and low stress
- Test Zr at high and low rate
- TEM analysis on tested specimens
(dislocation/twin generation)
- Calculate material properties from test

Future Work

- Finish calibration experiments
- Test single and polycrystal Cu at high and low stress levels
- Test Zr specimens
- TEM and Texture analysis on test specimens
- Develop laser based pressure-shear test
 - Laser pulses can only generate dilatational waves
 - Some form of mode conversion needed
 - Diagnostics will also be a challenge