Designing PMT Optical Interface

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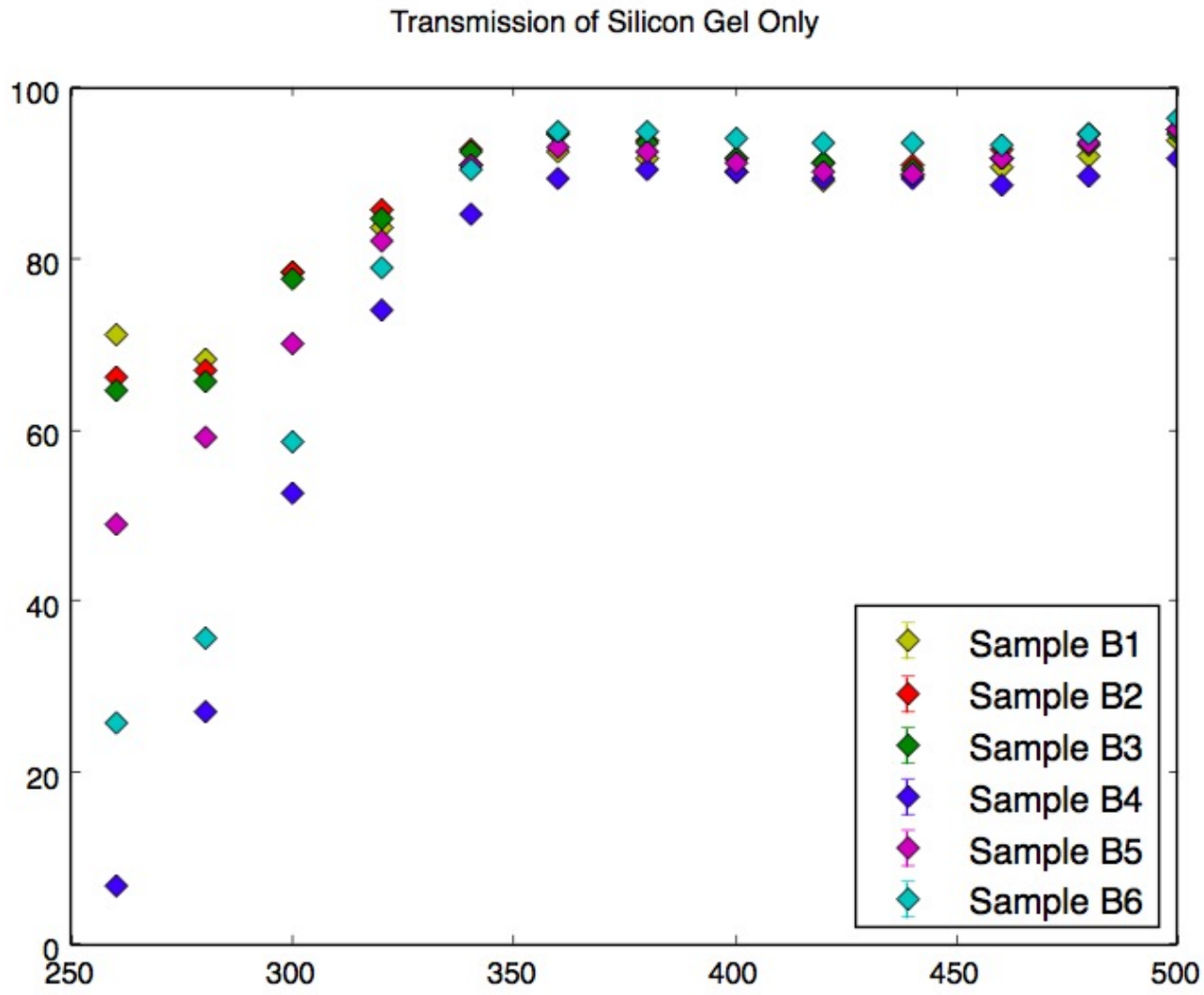
Update

Minor Adjustments to Set-Up

- Using larger photodiode (1010BQ)

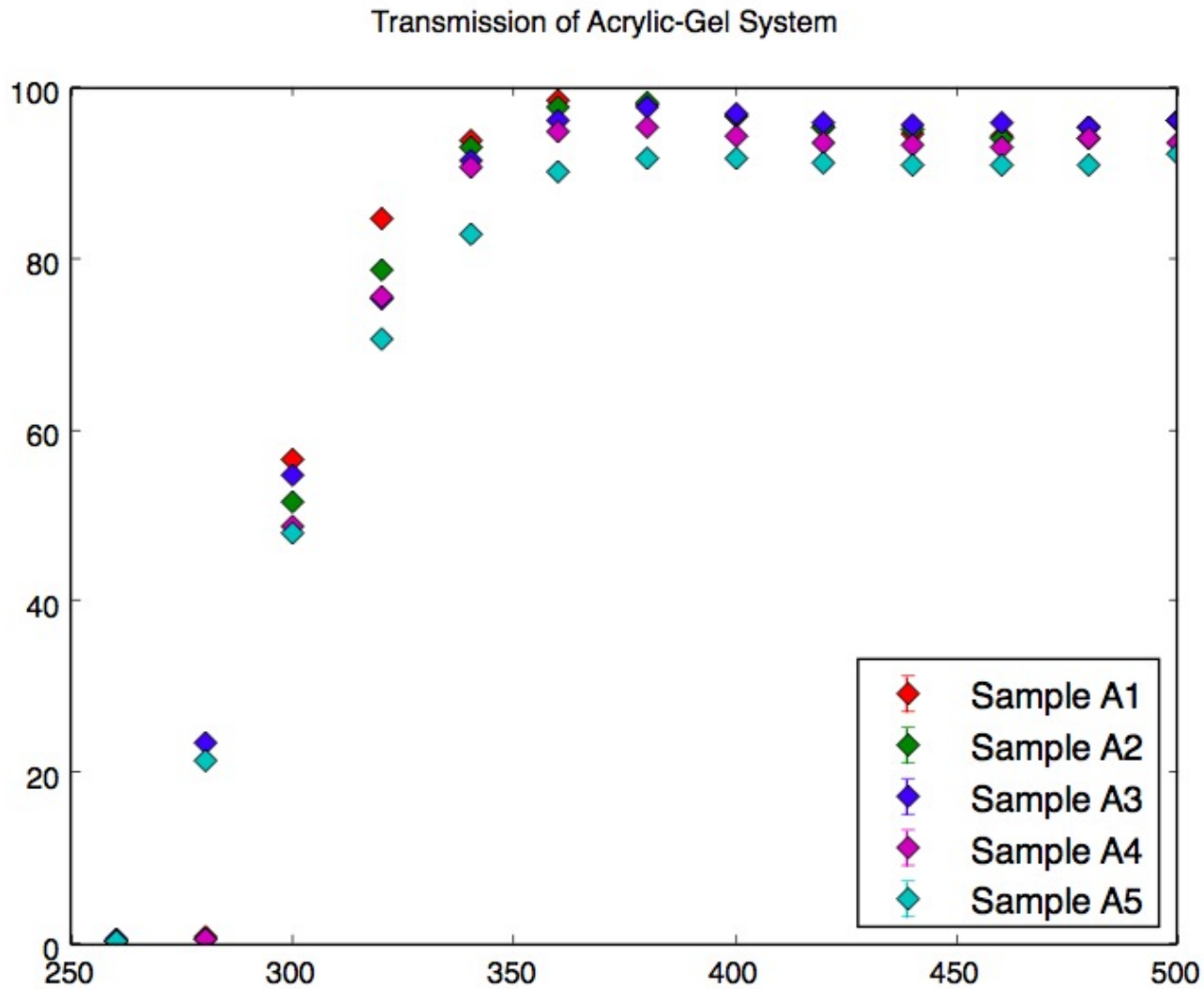
Transmission Measurements for Silicon Gel



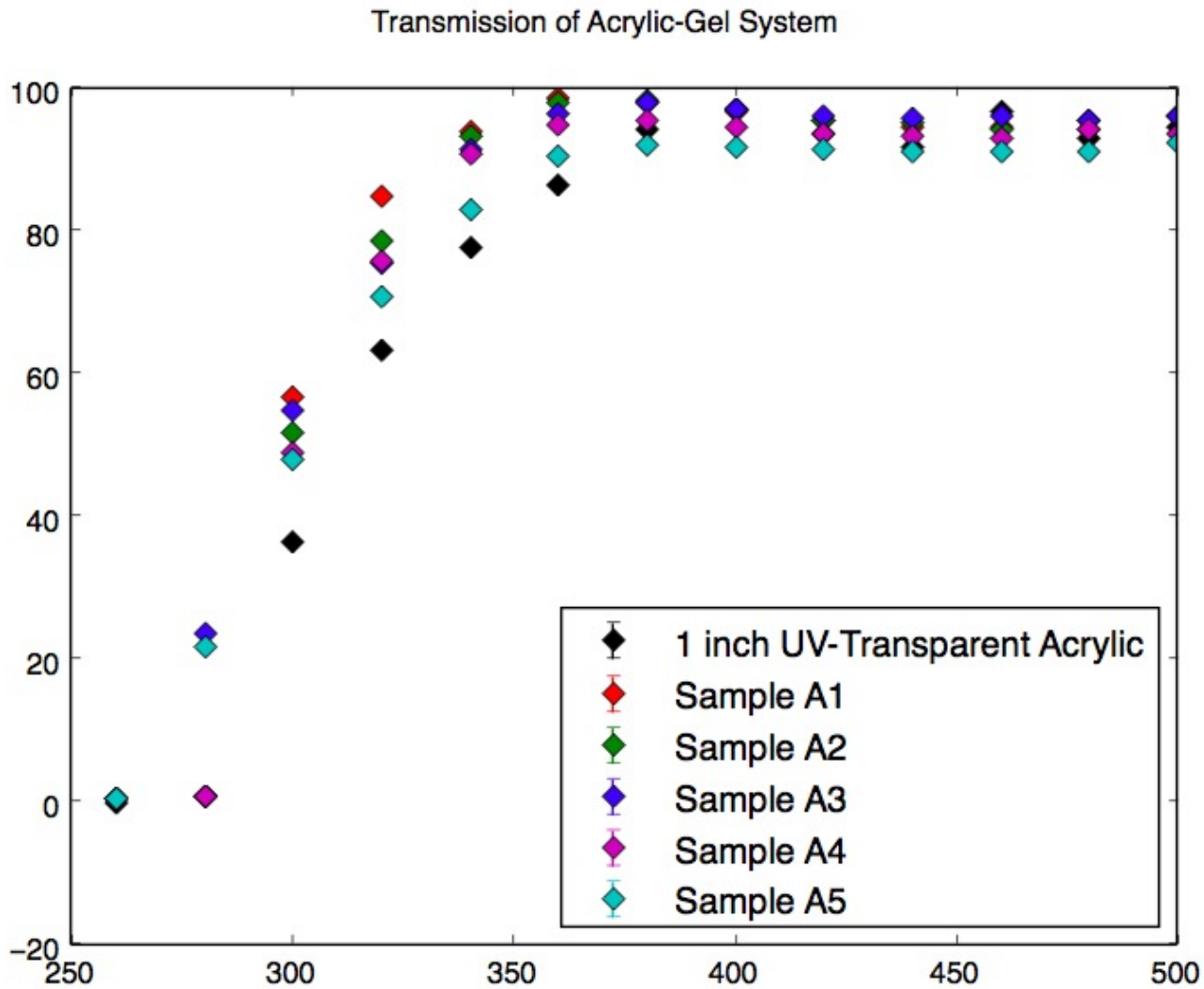
Transmission Measurements for Silicon Gel - Notes

- Gel transmits light at lower wavelengths better than acrylic does
- May still contribute to loss of light at lower wavelengths
- B4 seems to be the odd one out

Transmission Measurements for Silicon Gel-Acrylic Combined System



Transmission Measurements for Silicon Gel-Acrylic Combined System - In Comparison to 1" Acrylic

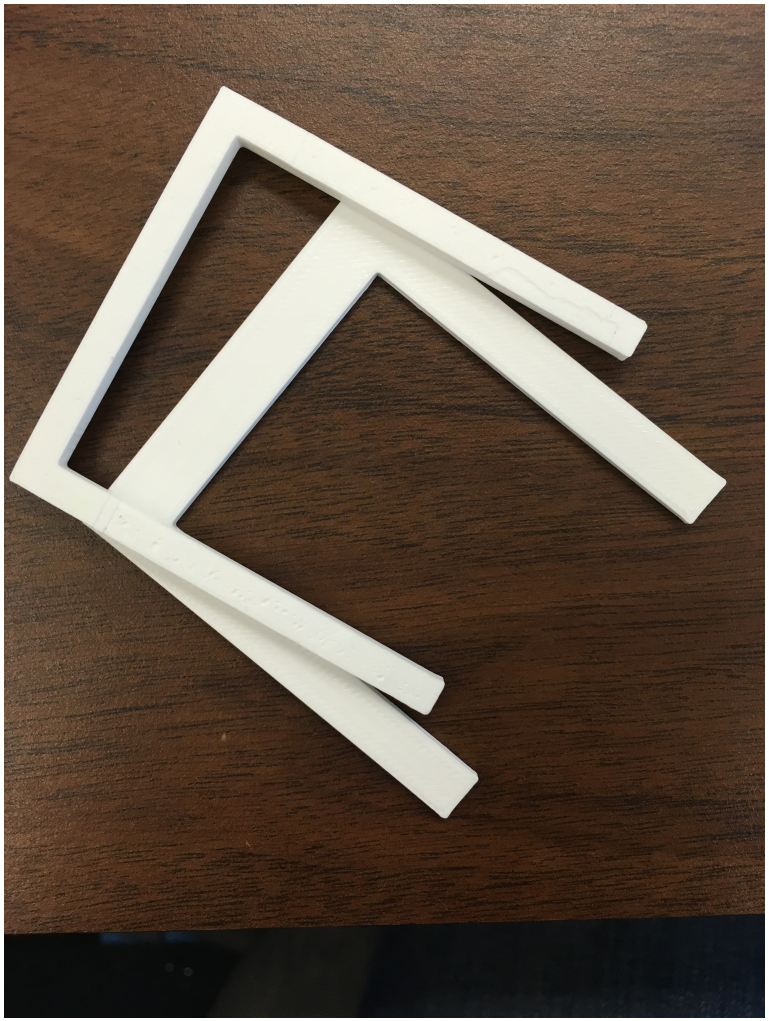


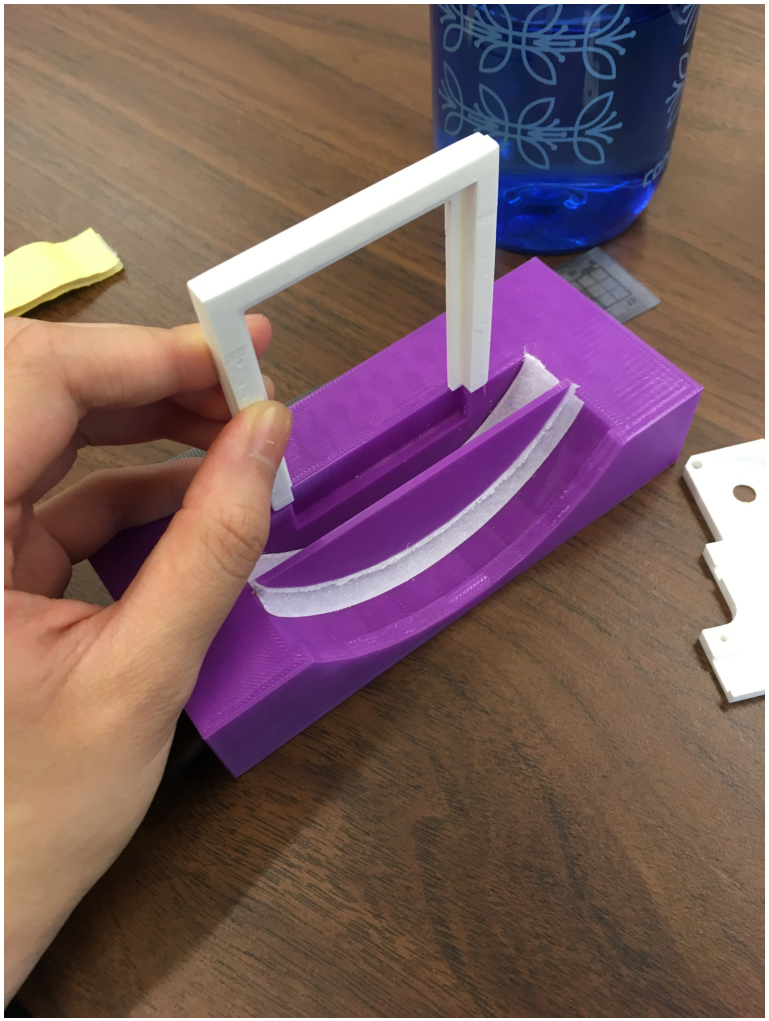
Transmission Measurements for Silicon Gel-Acrylic Combined System - Notes

- Could focus on improving transmission for light of wavelengths below 350 nm
- Thinner silicon gel layer results in greater light transmission
- Gel-acrylic systems with 5 mm acrylic seem to perform better than 1" acrylic alone
- Sample A3 and A5 at 280 nm

Designing Sample Mount - Initial Design

Designing Sample Mount - Add-Ons

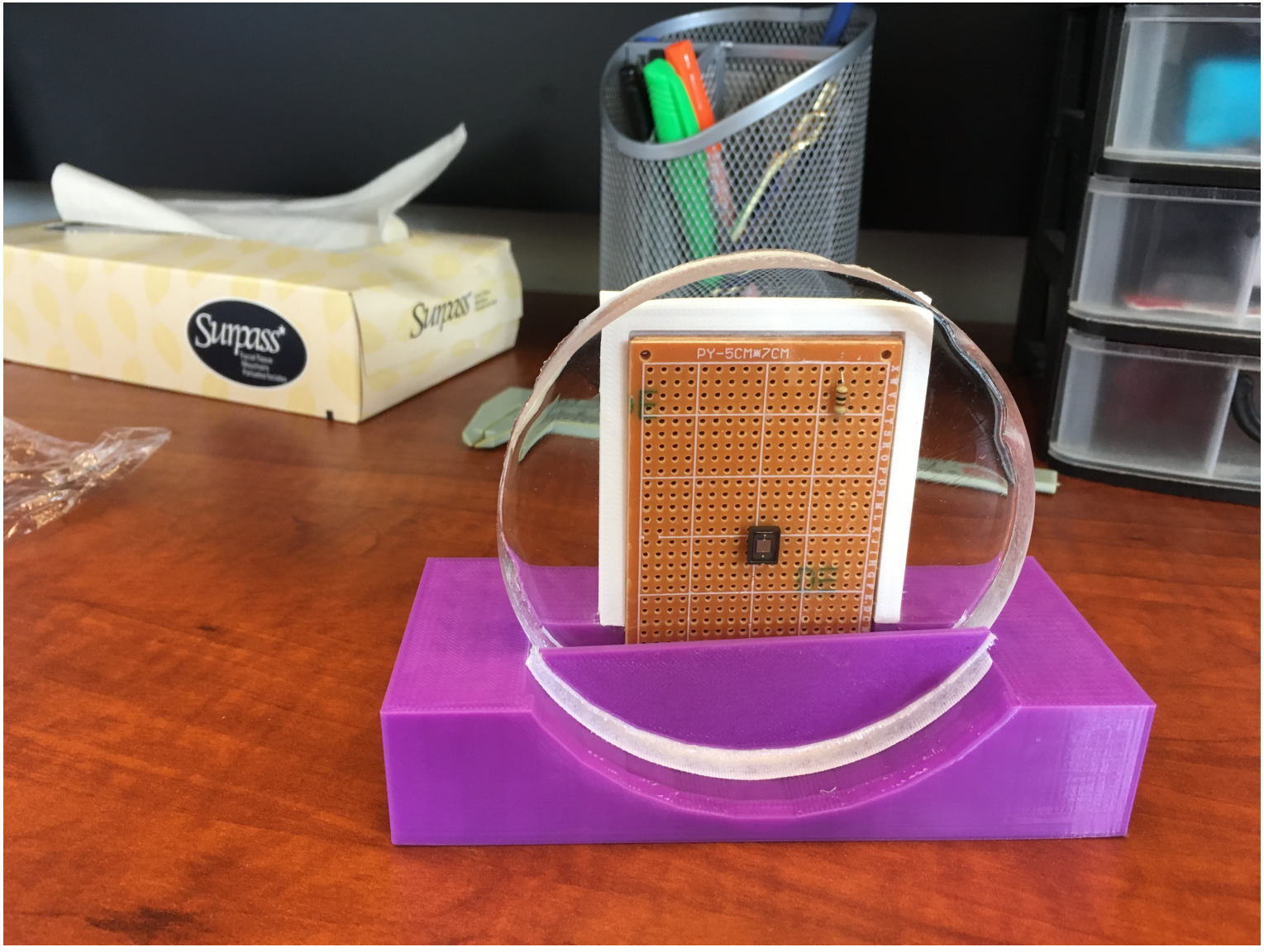




Designing Sample Mount - Features

- Circular well to hold puck samples
- Rectangular well to hold photodiode board
- Bottom of circular well lined with velcro
- Tapped metal insert at the bottom to mount onto optical post
- Additional photodiode board bracket to ensure board is upright

Designing Sample Mount - Mount in Action



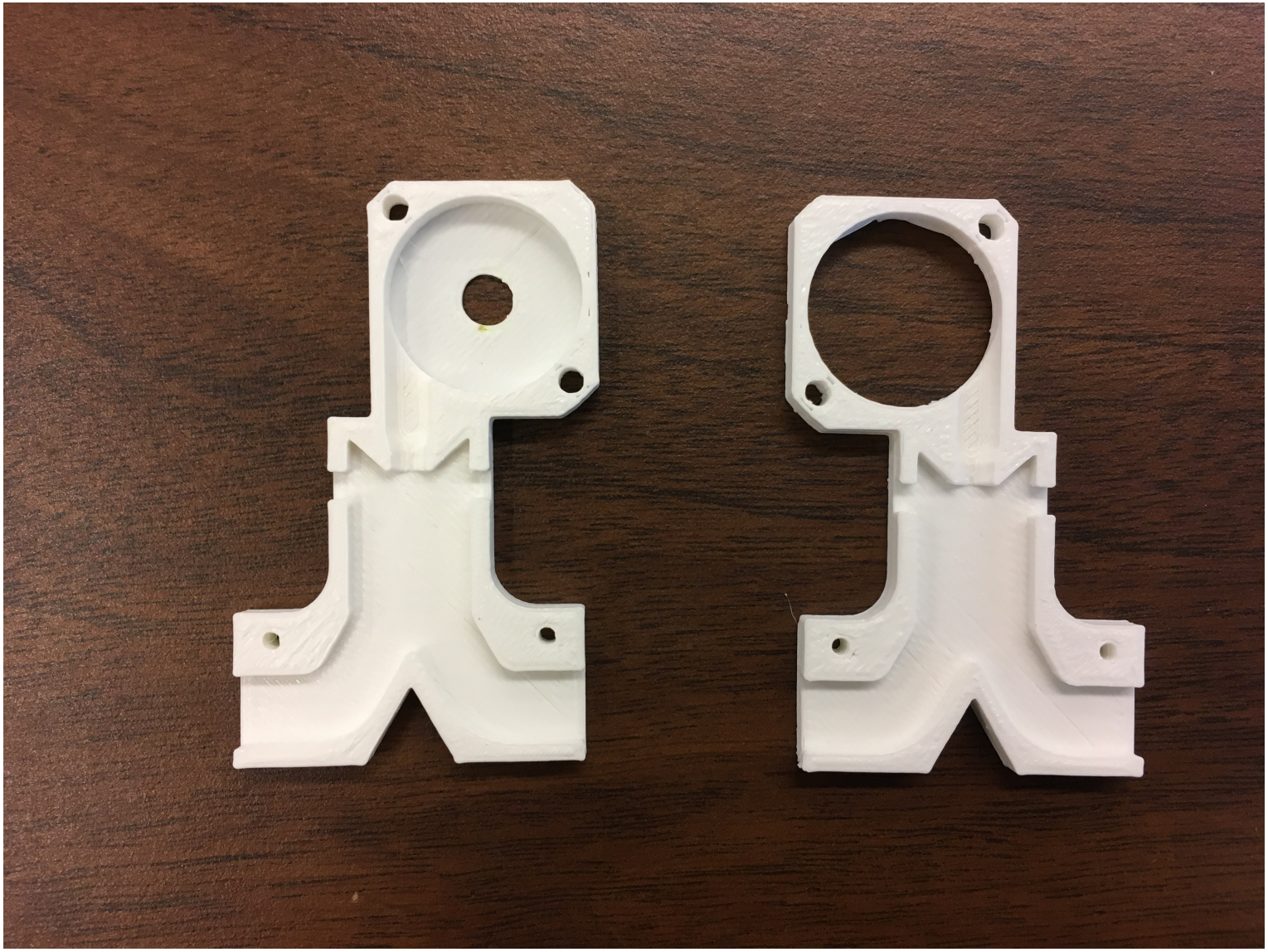
Designing Sample Mount - Current Problems

- **Problem:** Bracket not sticked securely onto the mount
- **Potential Fix:** Use stronger glue, considering printing mount as one whole piece
- **Problem:** Top of puck not completely pushed up against photodiode board
- **Potential Fix:** Hold top together with a clamp, position photodiode lower on the board

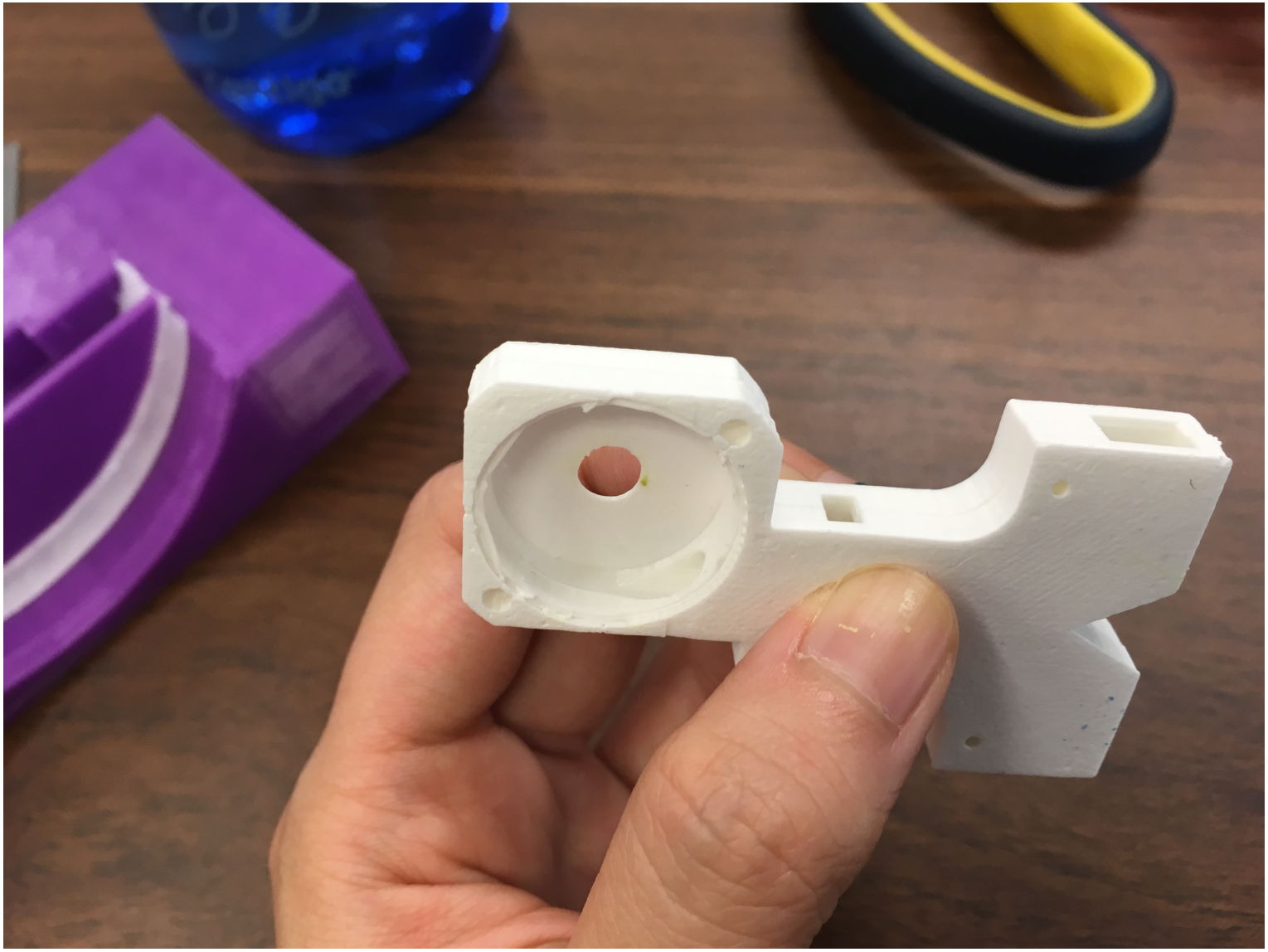
Prototyping Alev's Valve - General Comments

- Valve design involves some overhangs
- 3D printer doesn't handle overhangs
- Design sliced in half and each half printed separately
- 2 parts can be glued together later

Prototyping Alev's Valve - Valve Halved



Prototyping Alev's Valve - Valve In One Piece



Next Steps

Some Next Steps...

- Continue improving sample mount
- Possibly add water tank to more faithfully simulate detector conditions
- Perform more transmission measurements if needed
- Prepare for podium presentation (on 2017-08-15)