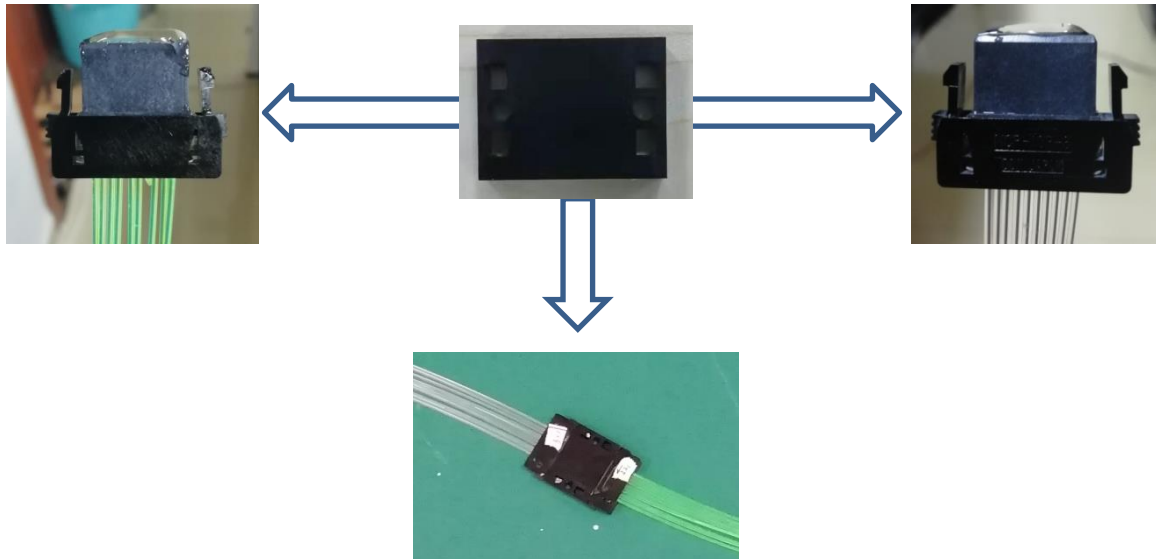
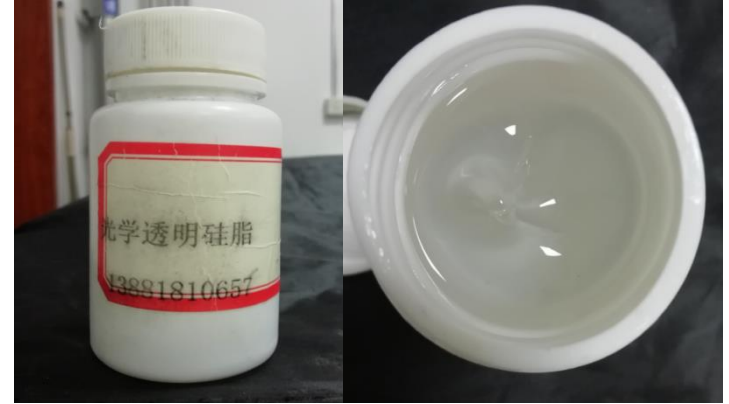


# Light loss from WLS to clear fiber (silicone grease coupling)

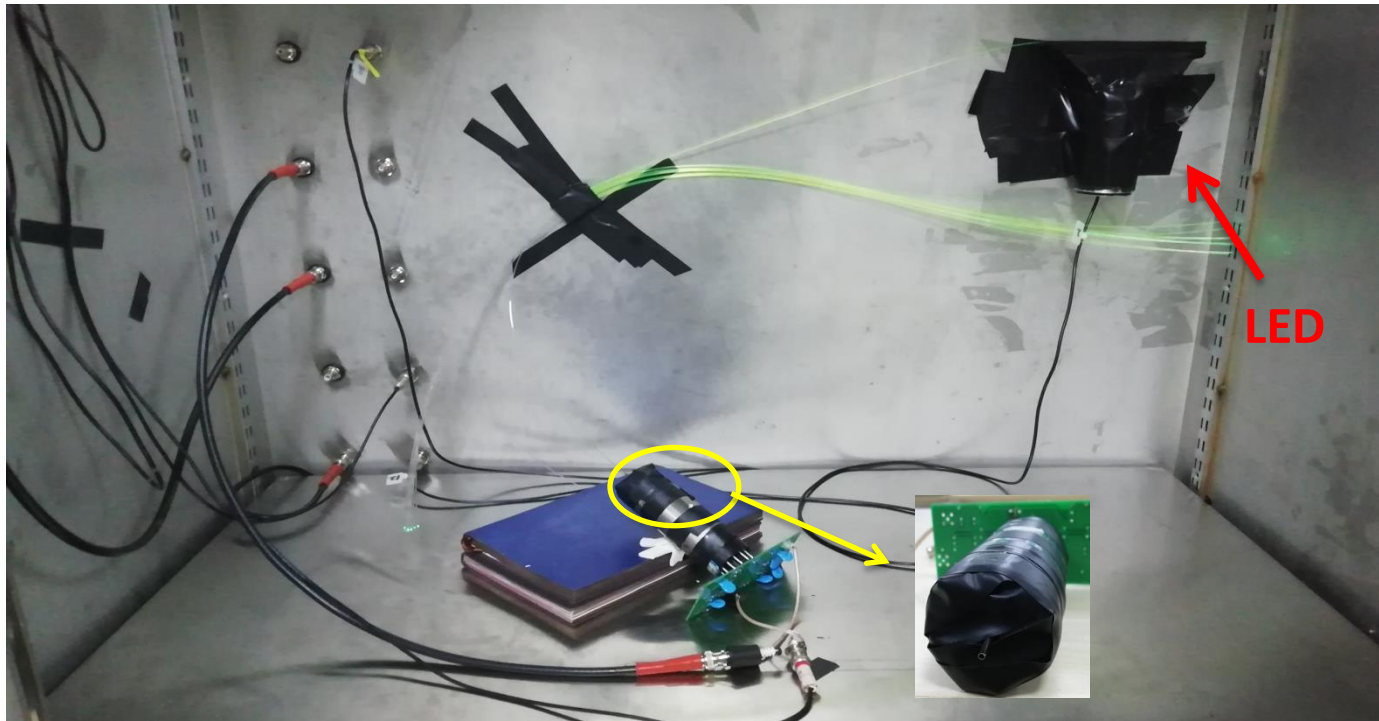
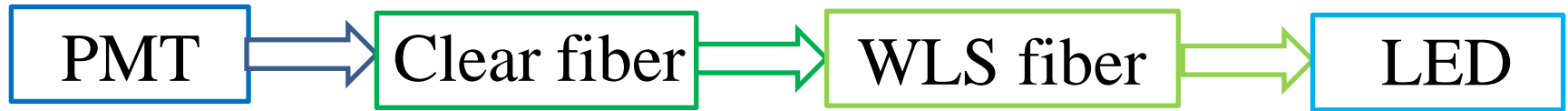
Liping Wang Ye Tian  
Shandong University  
Jul.11<sup>th</sup>,2019

# WLS to clear fiber through silicone grease coupling

Add silicone grease to the fiber end



# Testing configuration



To fix the LED , then replace the WLS fiber and clear fiber ,finally record the ADC channel count.

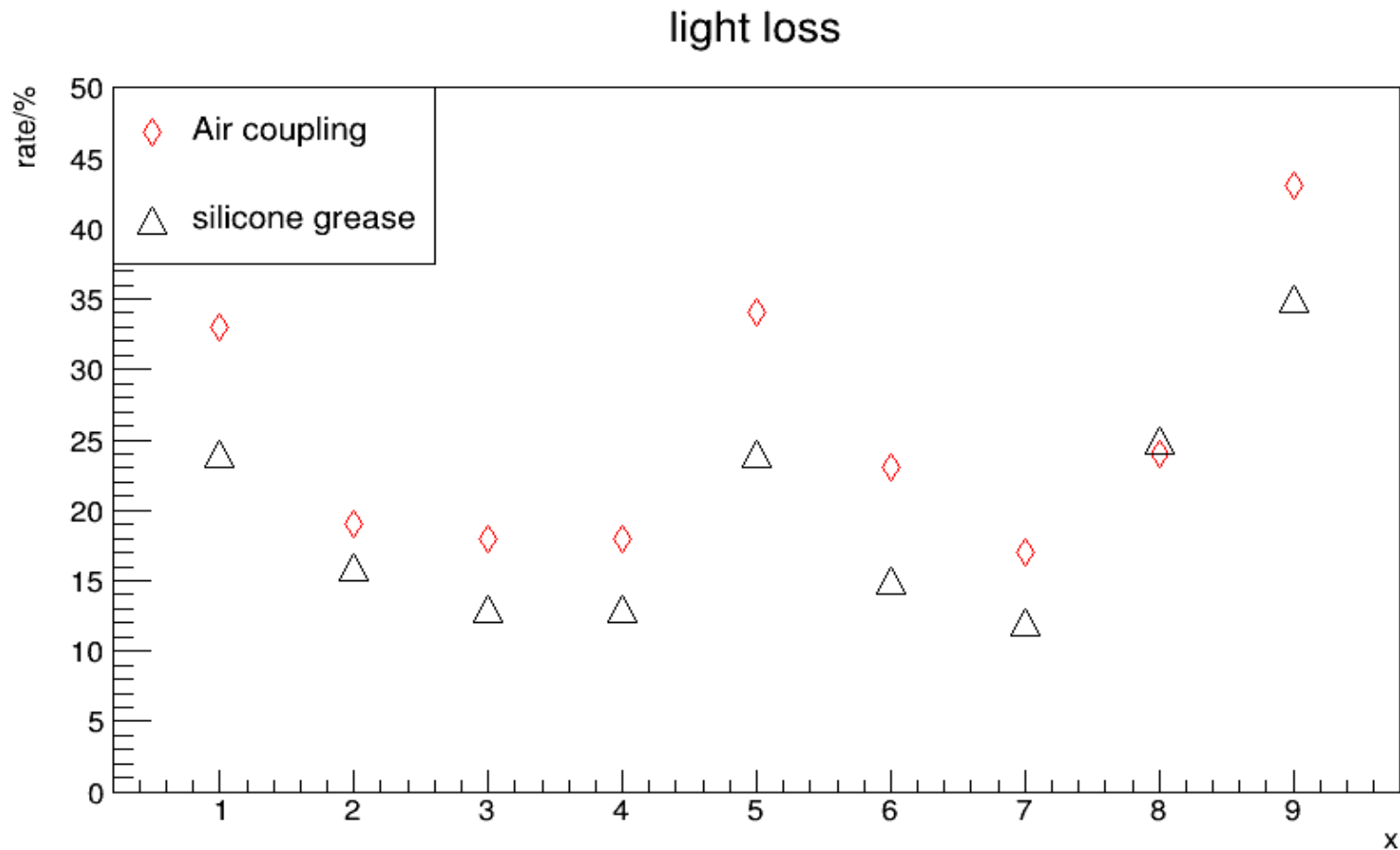
# Result



| Fiber | WLS fiber | Clear fiber<br>(air coupling) | Light loss<br>(air coupling)<br>(WLS - clear(air) / WLS) | Clear fiber<br>(silicone coupling) | Light loss<br>(silicone coupling)<br>(WLS - clear(silicone) / WLS) | Relative rate<br>(air-silicone/air) |
|-------|-----------|-------------------------------|--|------------------------------------|--|-------------------------------------|
| 1     | 672       | 446                           | 0.33   | 512                                | 0.23   | 0.29                                |
| 2     | 607       | 489                           | 0.19   | 511                                | 0.16   | 0.19                                |
| 3     | 591       | 483                           | 0.18   | 513                                | 0.13   | 0.28                                |
| 4     | 599       | 492                           | 0.17   | 524                                | 0.13   | 0.30                                |
| 5     | 761       | 502                           | 0.34   | 580                                | 0.24   | 0.30                                |
| 6     | 601       | 464                           | 0.23   | 511                                | 0.15   | 0.34                                |
| 7     | 593       | 490                           | 0.17   | 520                                | 0.12   | 0.29                                |
| 8     | 656       | 494                           | 0.24   | 492                                | 0.25   | -0.01                               |
| 9     | 809       | 456                           | 0.43   | 524                                | 0.35   | 0.19                                |

After adding the silicone grease ,the light loss is reduced by 24% relative to air coupling

# Light loss (distribution)



The light loss varies from different fiber, and some vary too much (fiber? thickness of silicone grease? ) Need more study .

# Next step

- Do more modules(wls fiber to clear fiber) by ourself
- Add different medium to the junction, then comparing the results
- Find out the best scheme of coupling wls fiber and clear fiber