

Optical Reflectivity of Graphene

Christopher Yaluma

Stephen Johnson

Patrick Hunley

Andrei Terentiev

Aaron Meacham

Abhishek Sundararajan

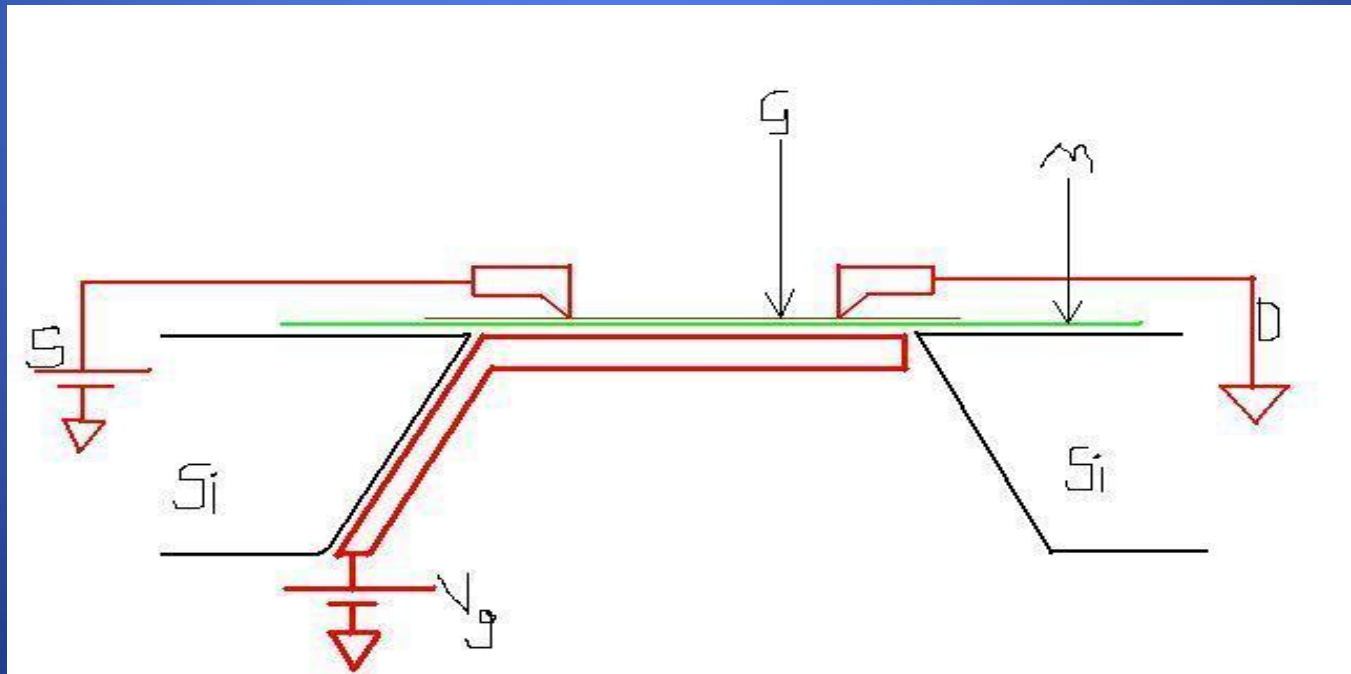
Santiago de León

Doug Strachan



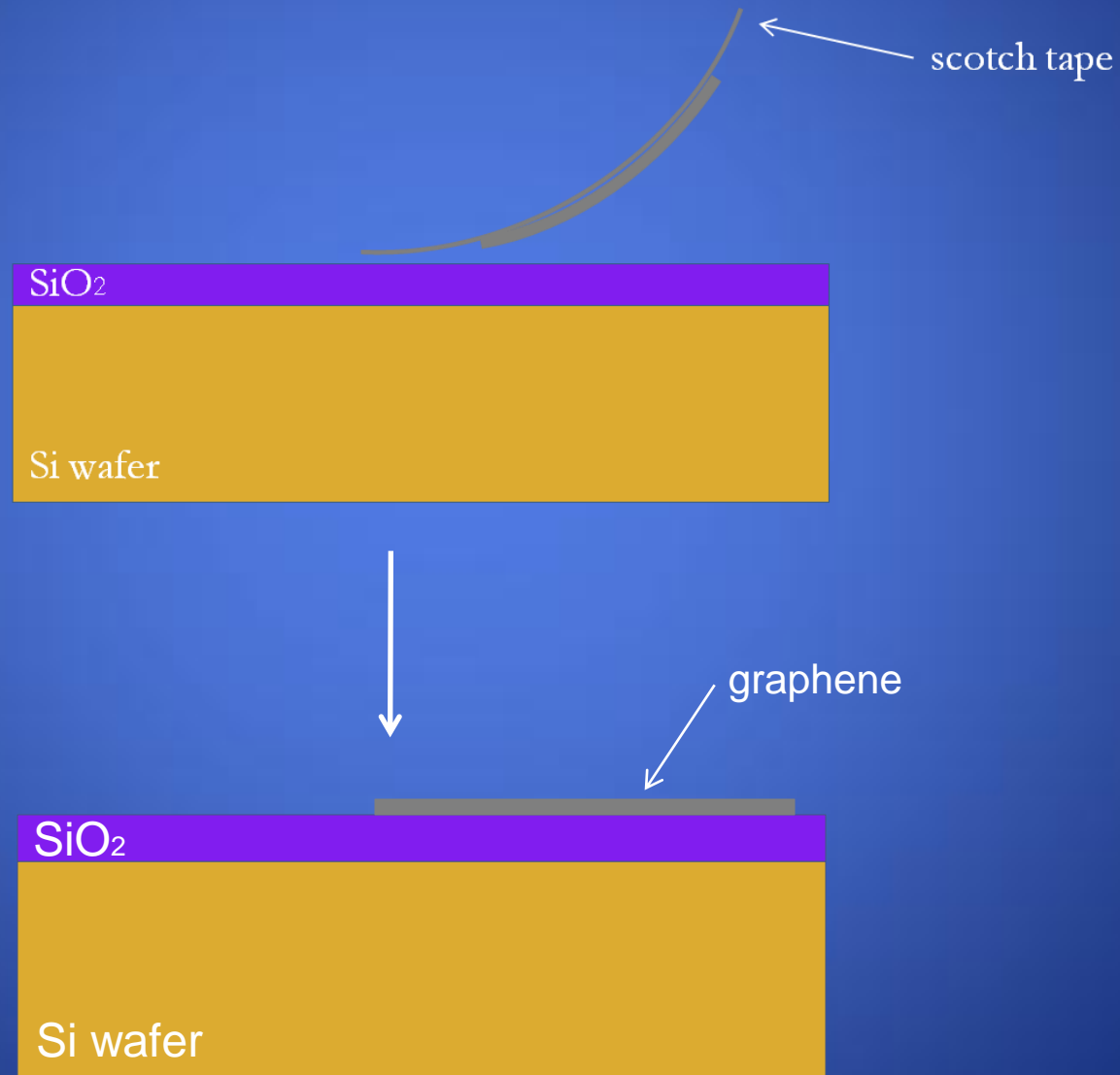
Graphene transistors on membranes

- Want to construct few-layer graphene Field Effect Transistors (FETs) on transparent membranes



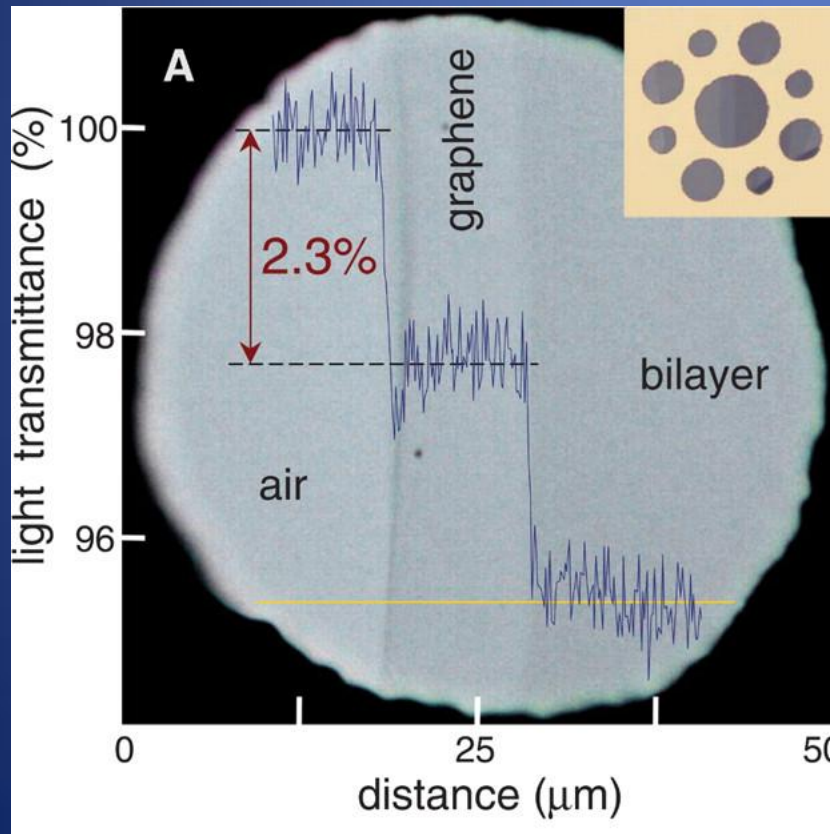
Mechanical Exfoliation of Graphene

(scotch tape method)

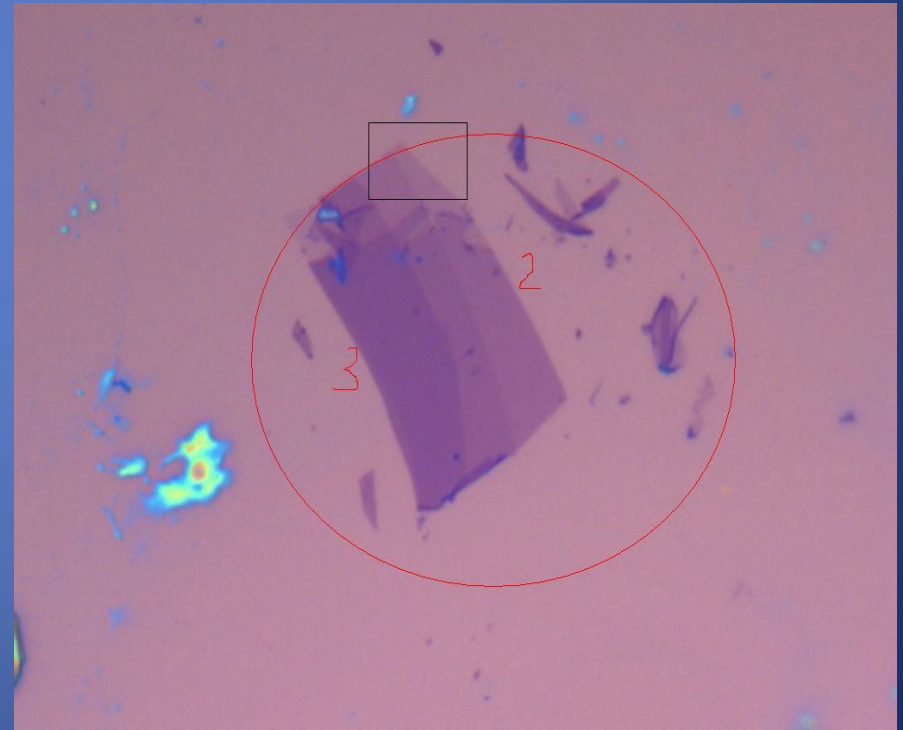


Transparency vs Reflectance

Transmission



Reflection



Outline

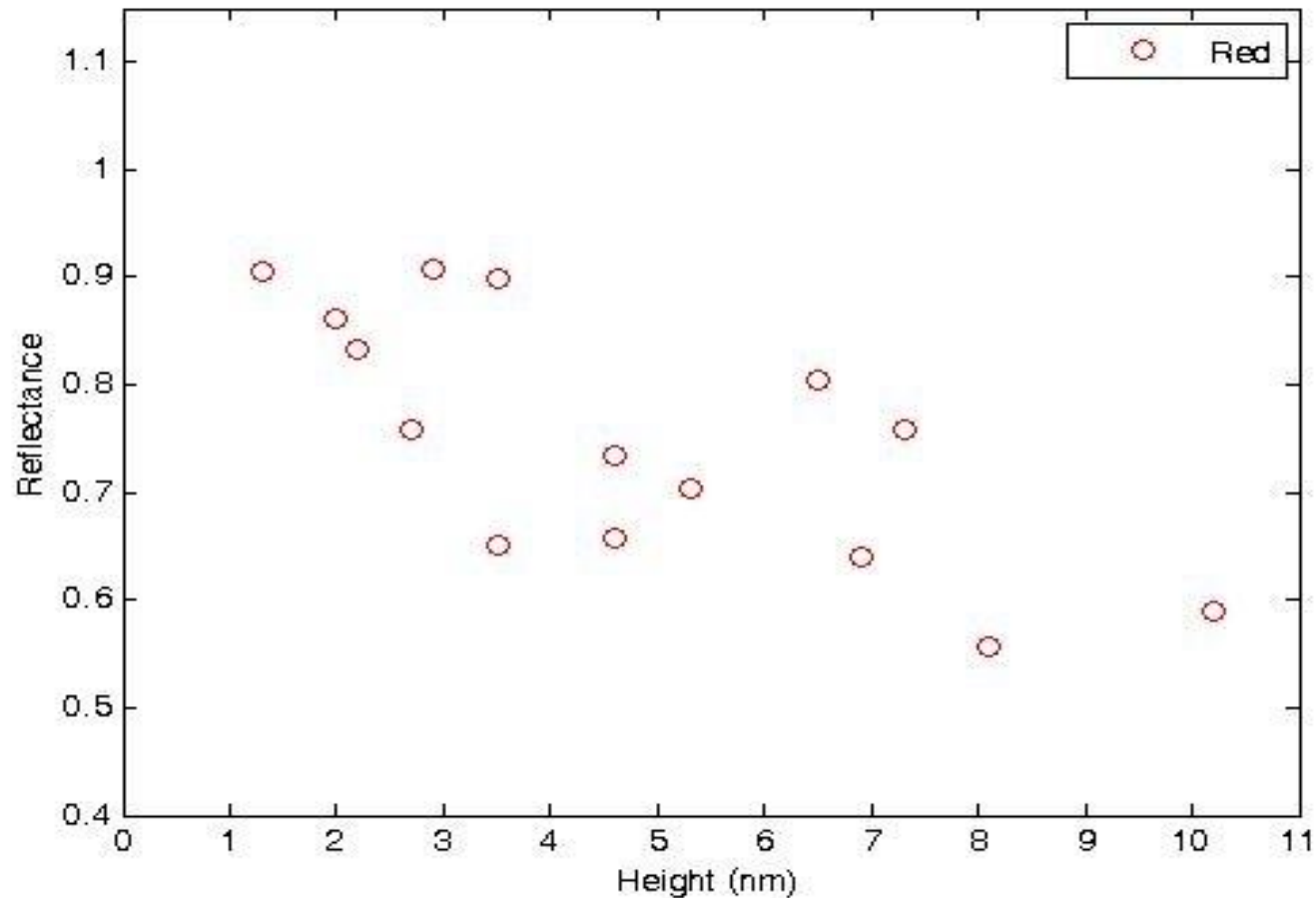
1. Obtain graphene through mechanical exfoliation
2. Then put on different substrates i.e. SiN_x
3. Take images with Q Color 3 camera
4. Determine the thickness of graphene layers using AFM
5. Obtain reflectance ratio by analyzing the collected data

A Few Simple Equations

$$\textit{Reflectance \%} = \frac{R_g}{R_s}$$

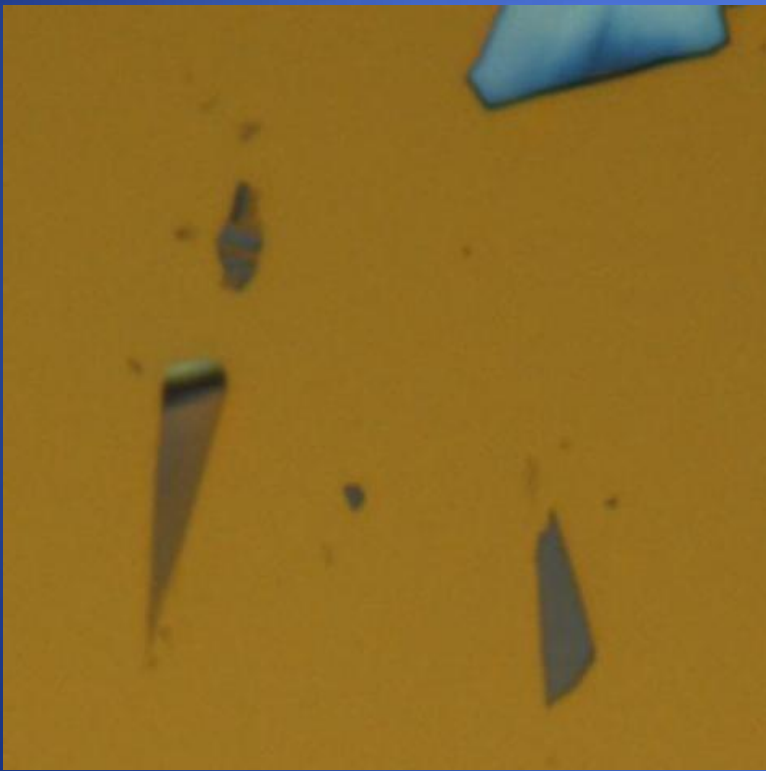
$$\textit{Contrast} = \frac{R_s - R_g}{R_s}$$

Results for Reflectance

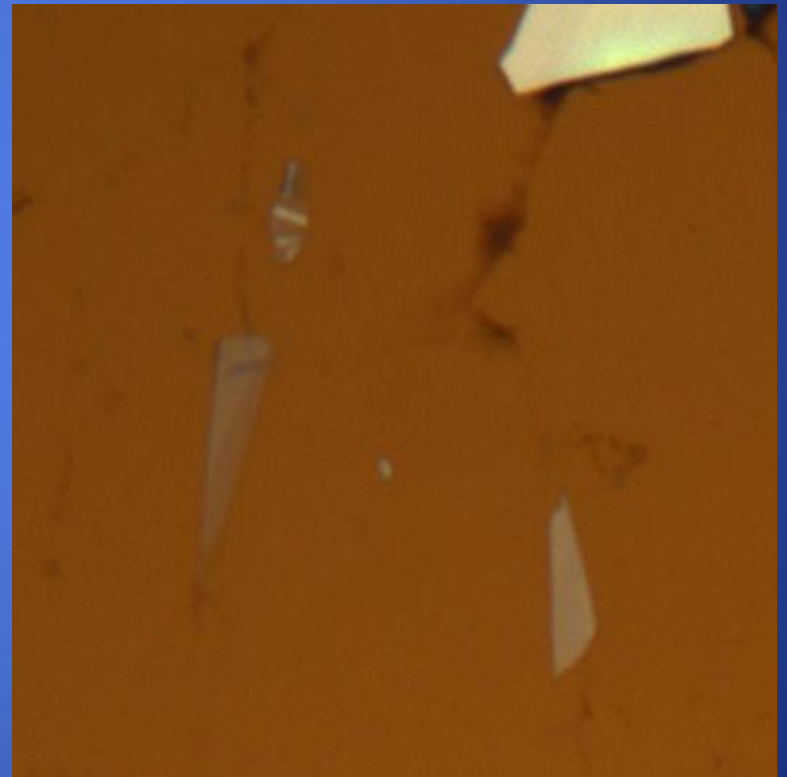


Graphene Images on SiN_x

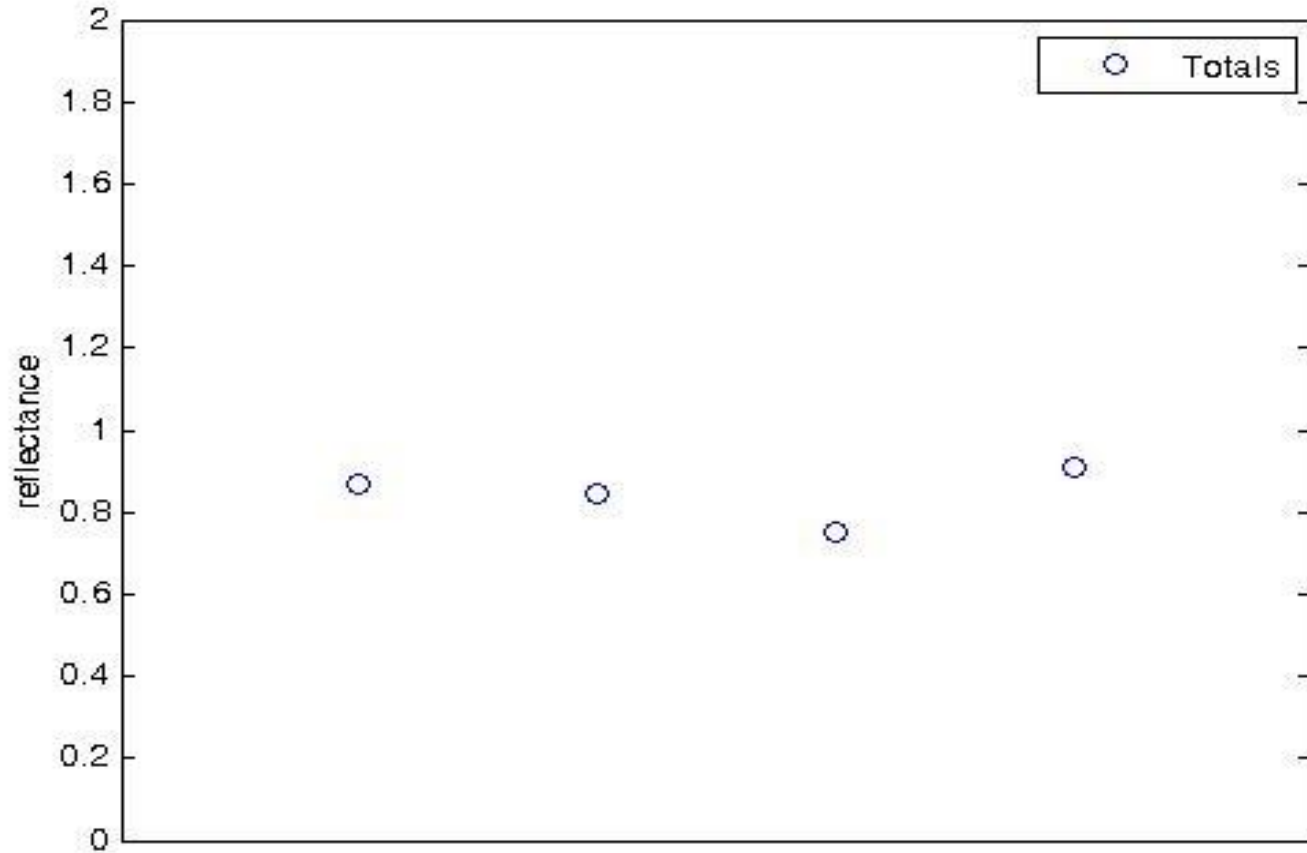
- (w PMMA)



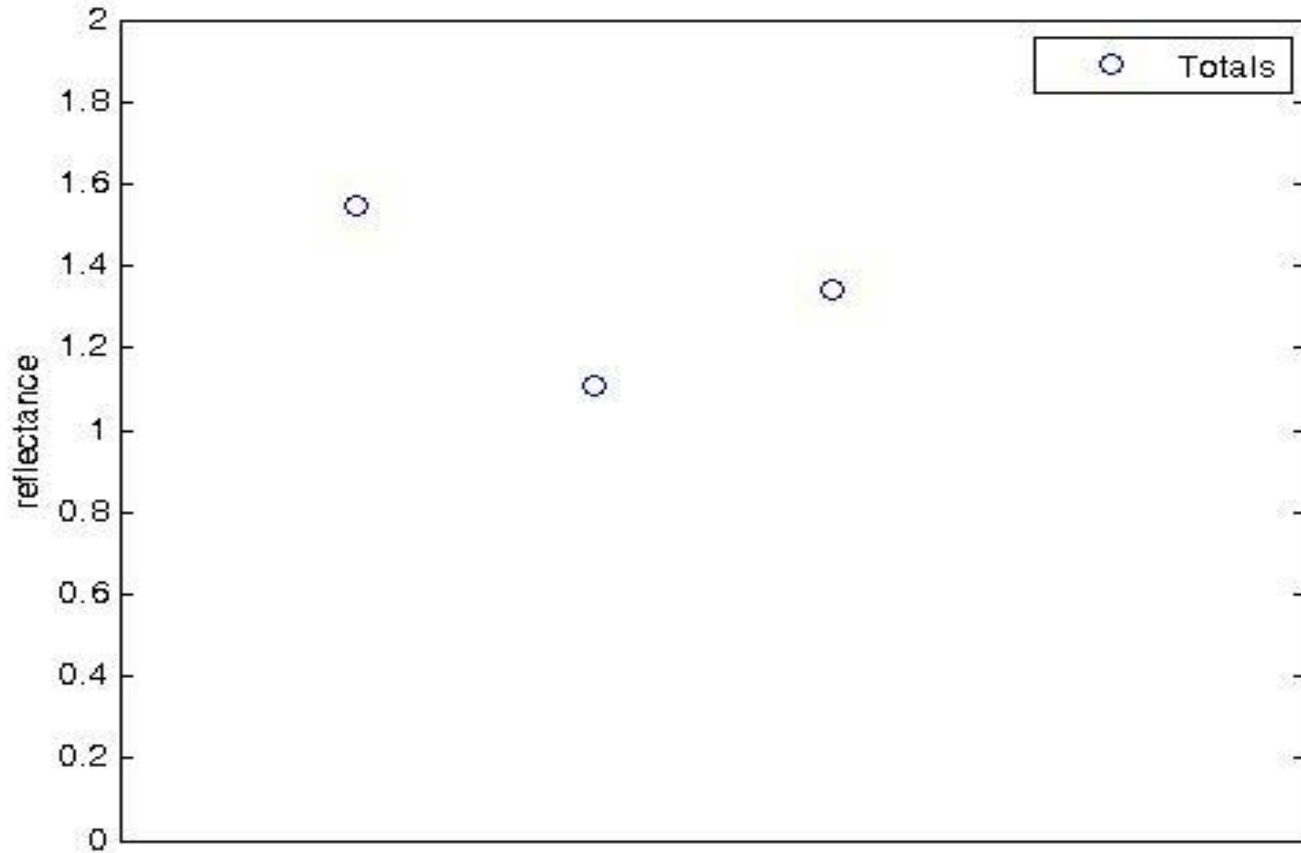
- (w/o PMMA)



Results for Contrast(wPmma)



Results for Contrast(w/o PMMA)



Summary

- We can determine SLG and BLG on silicon dioxide substrates
- We can make SLG/BLG visible on most substrates with spin coating



THANK YOU