

High End Freeware

Part 1:

Image analysis using
ImageJ and add-ons

History

- NIH Image was originally developed for the Macintosh in 1987
- More recently ported to Java for platform independence
- See a discussion of history at:
- [http://www.researchgate.net/publication/228085958 NIH Image to ImageJ 25 years of image analysis](http://www.researchgate.net/publication/228085958_NIH_Image_to_ImageJ_25_years_of_image_analysis) (PDF available on our website)
- Multiple plug-ins available

My Problem

- Clarity of semi transparent PV modules at Konarka



Window Film Characterization

- **Haze** is the measurement of wide-angle scattering, and causes a loss of contrast or a milky appearance.
- **Clarity** is the measure of narrow-angle scattering, and causes the detail of an object to be compromised when viewing it through the film.



Fig. 1

See-through quality
of clear specimens
(0 % haze,
100 % clarity)

Milky/hazy
appearance
(high haze value)

Distorted, unsharp
appearance
(low clarity value)

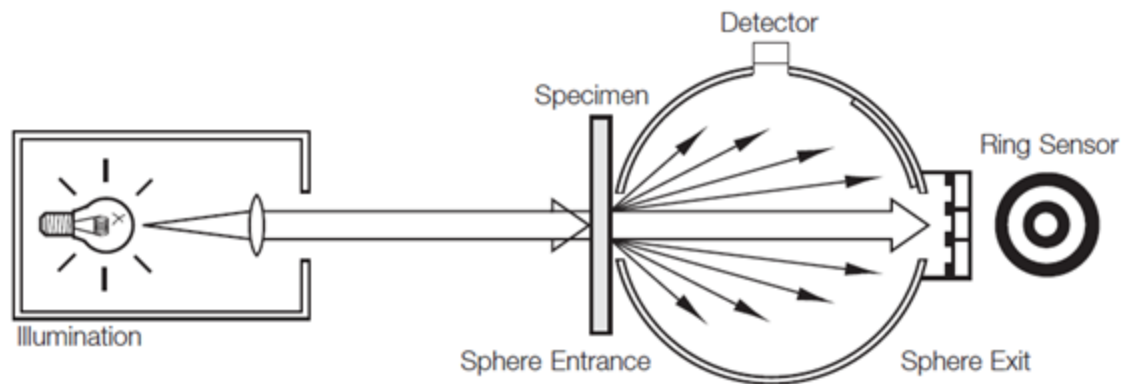
Standard Instrumentation

- Byk Gardner Haze-Gard Plus



Problem!

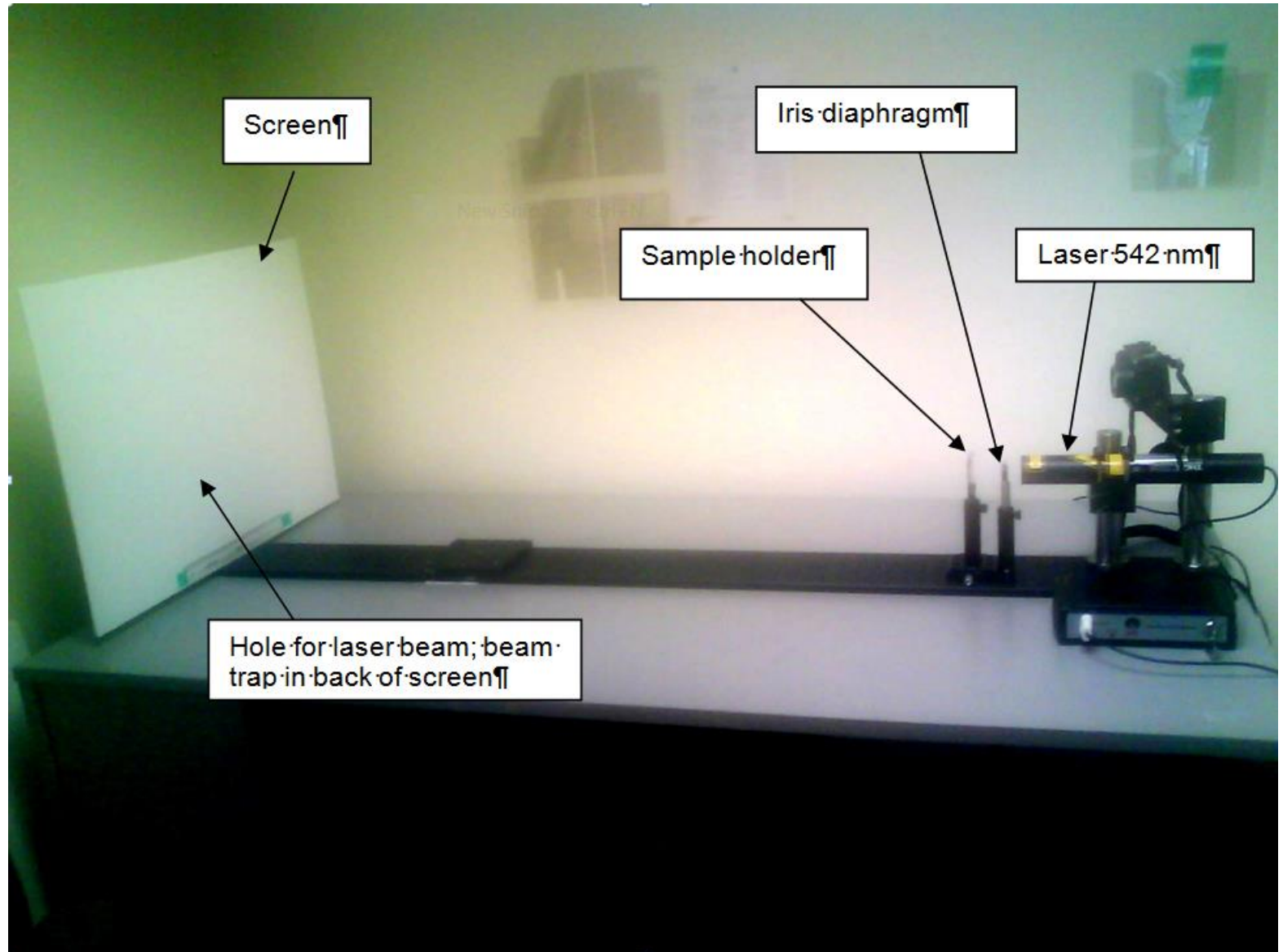
- We had samples that measured with very good clarity but looked very bad by eyeball
- The Haze-Gard Plus quantitates clarity by light scattering at 2.7 degrees:



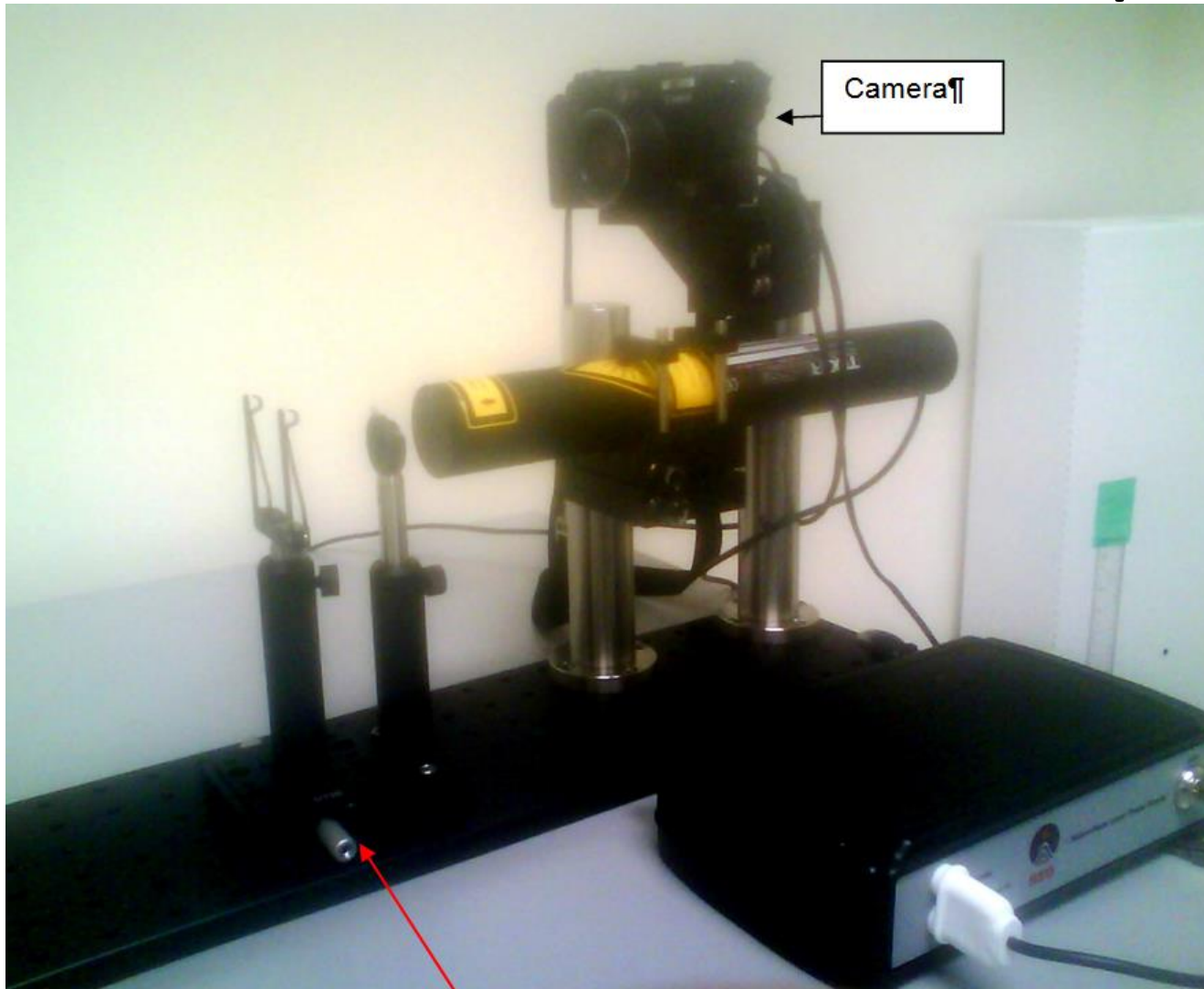
Suspected scattering at angles less than 2.7 degrees

- We required an easy way to generate relative goniophotometric data
- We set up a a green laser to shine light through the film sample and photographed the light scattered onto a white screen
- The digital photograph was analyzed with ImageJ and Radial Profile Plot plug-in

The apparatus



Laser and camera close-up



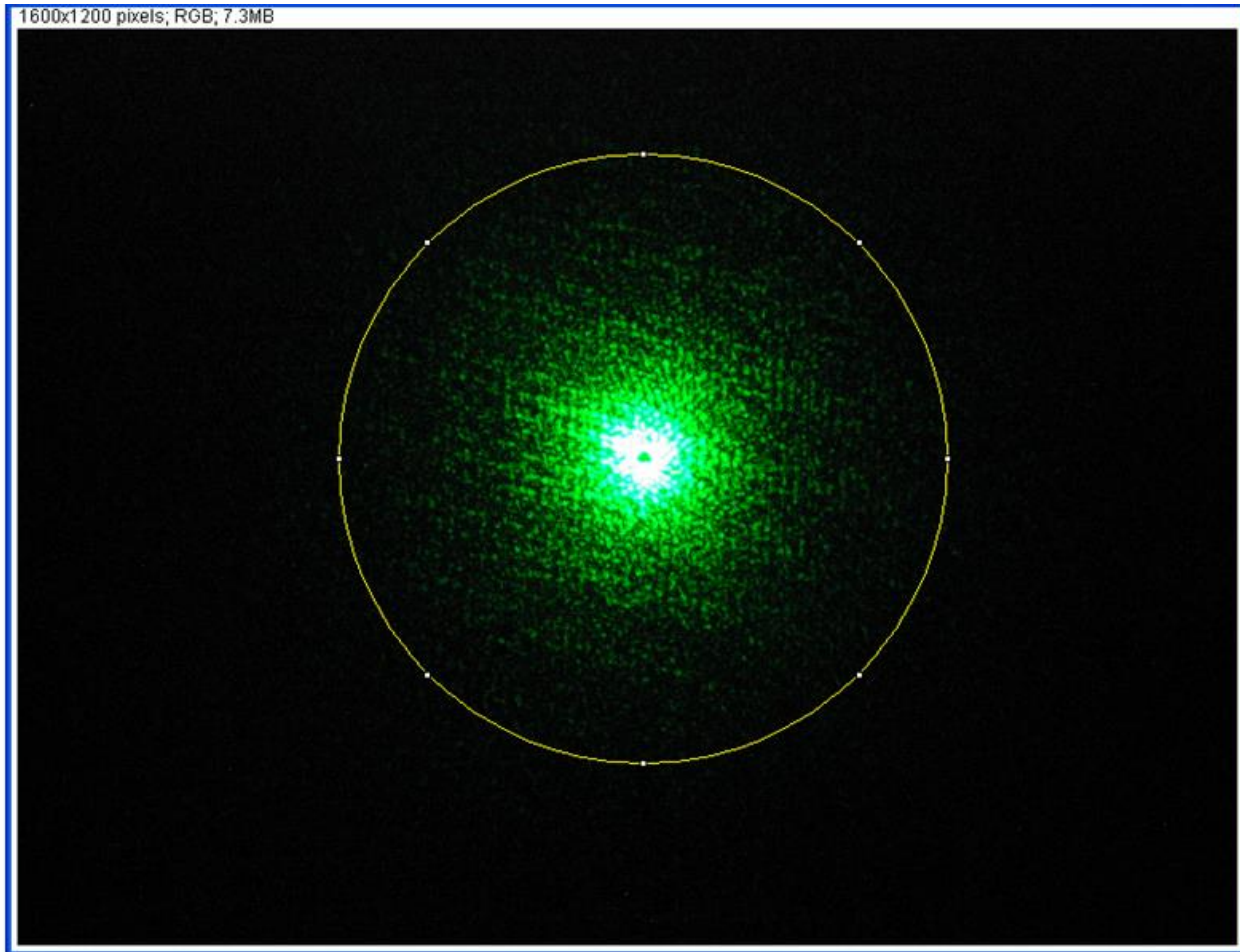
Camera

Translation stage for sample holder

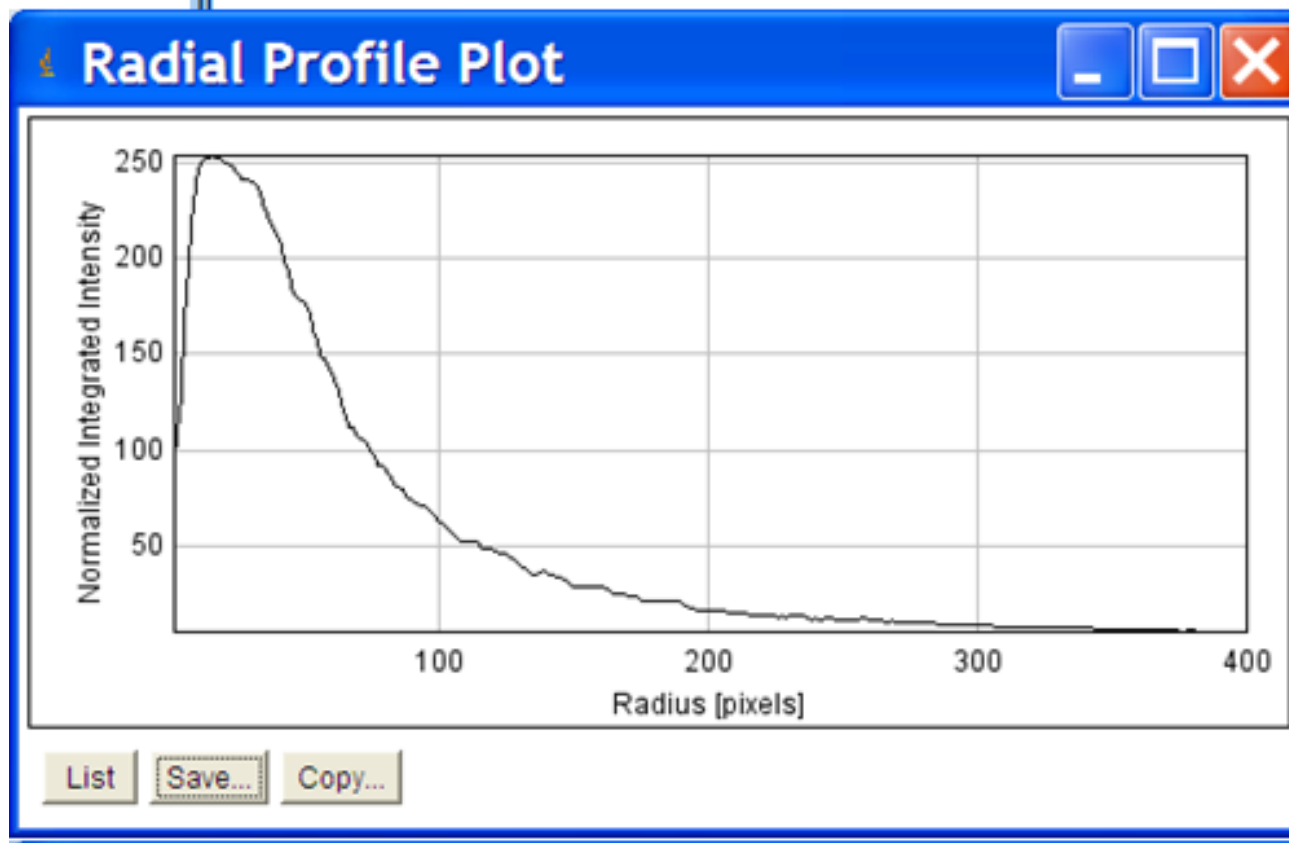
Image Analysis Demo (ImageJ)

- [C:\Program Files \(x86\)\ImageJ\ImageJ.exe](C:\Program Files (x86)\ImageJ\ImageJ.exe)

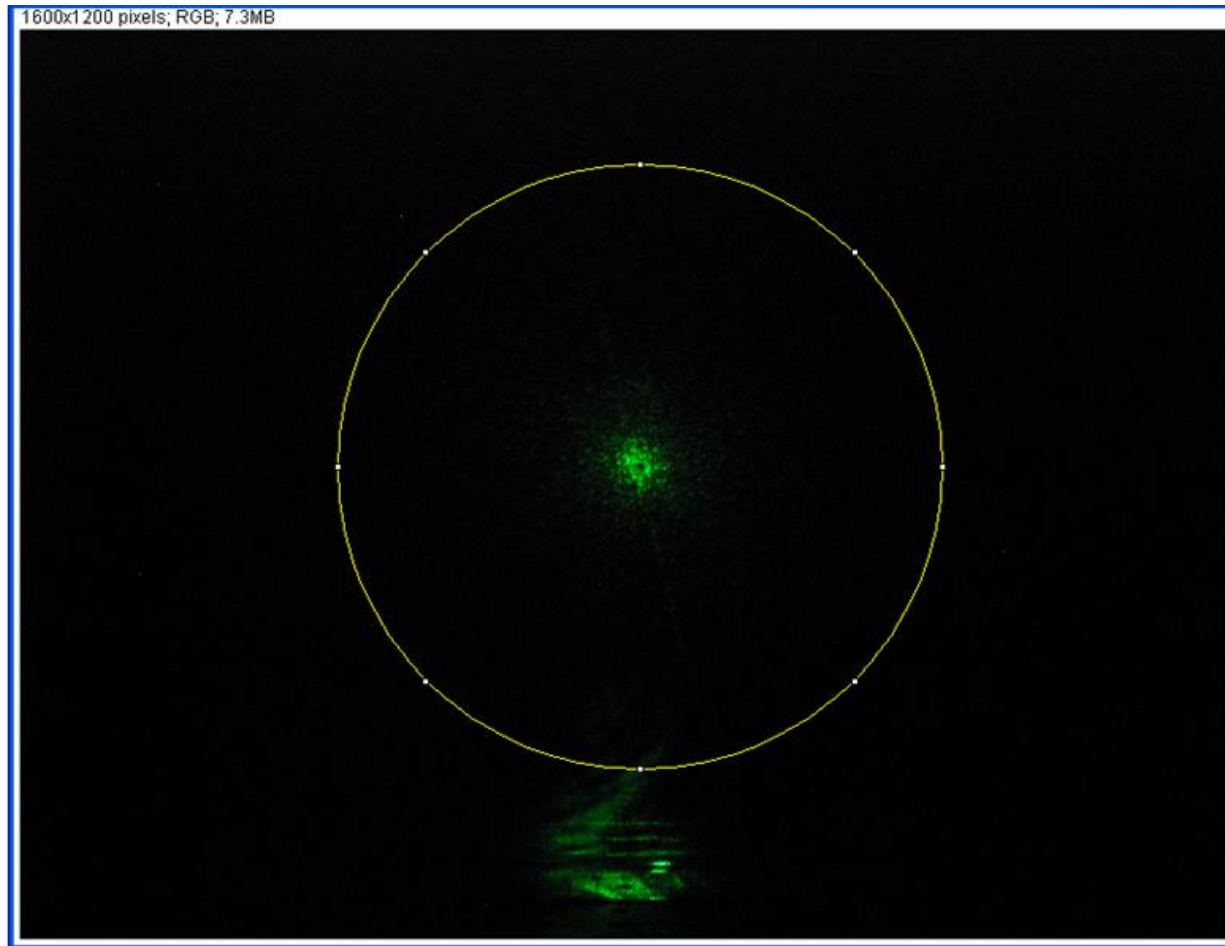
Bad film



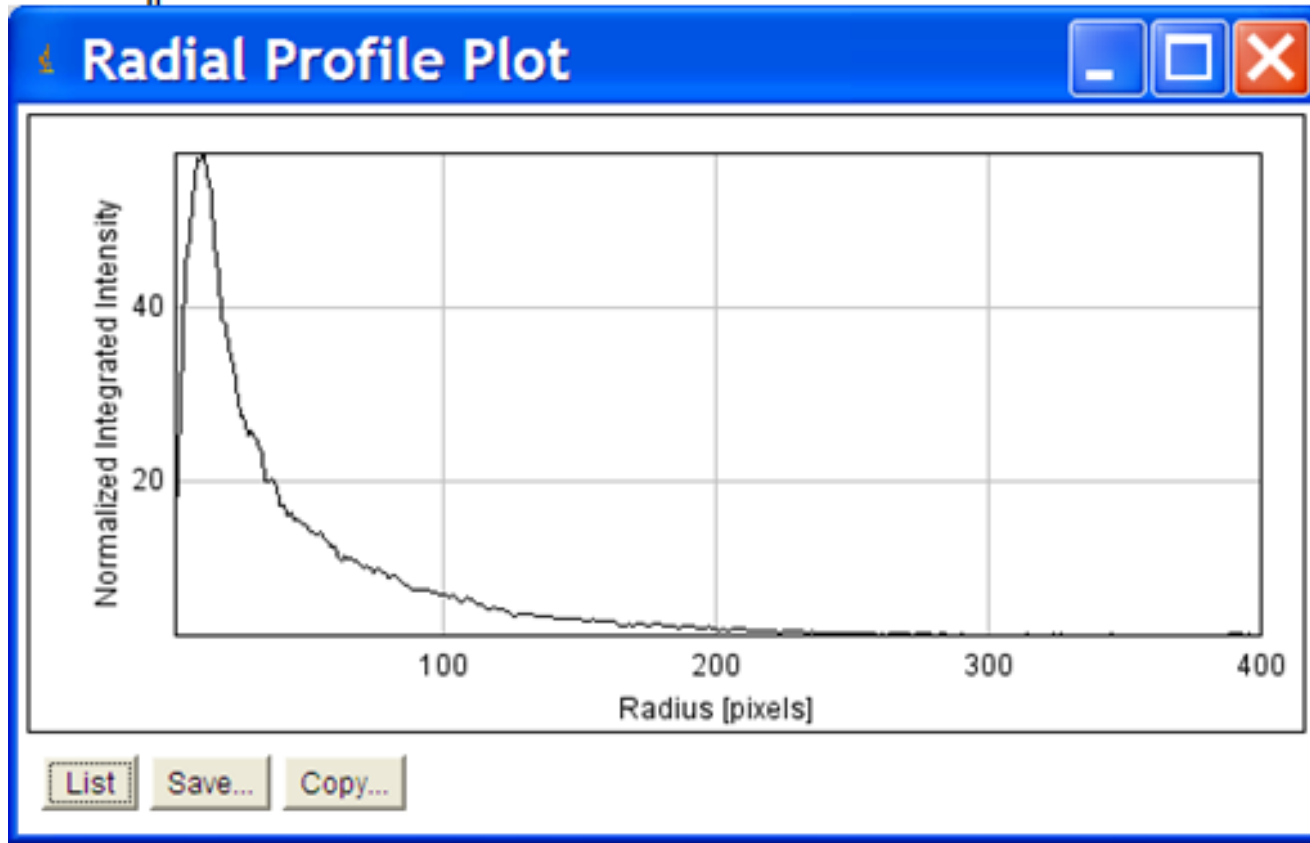
Bad film (Radial Profile Plot)



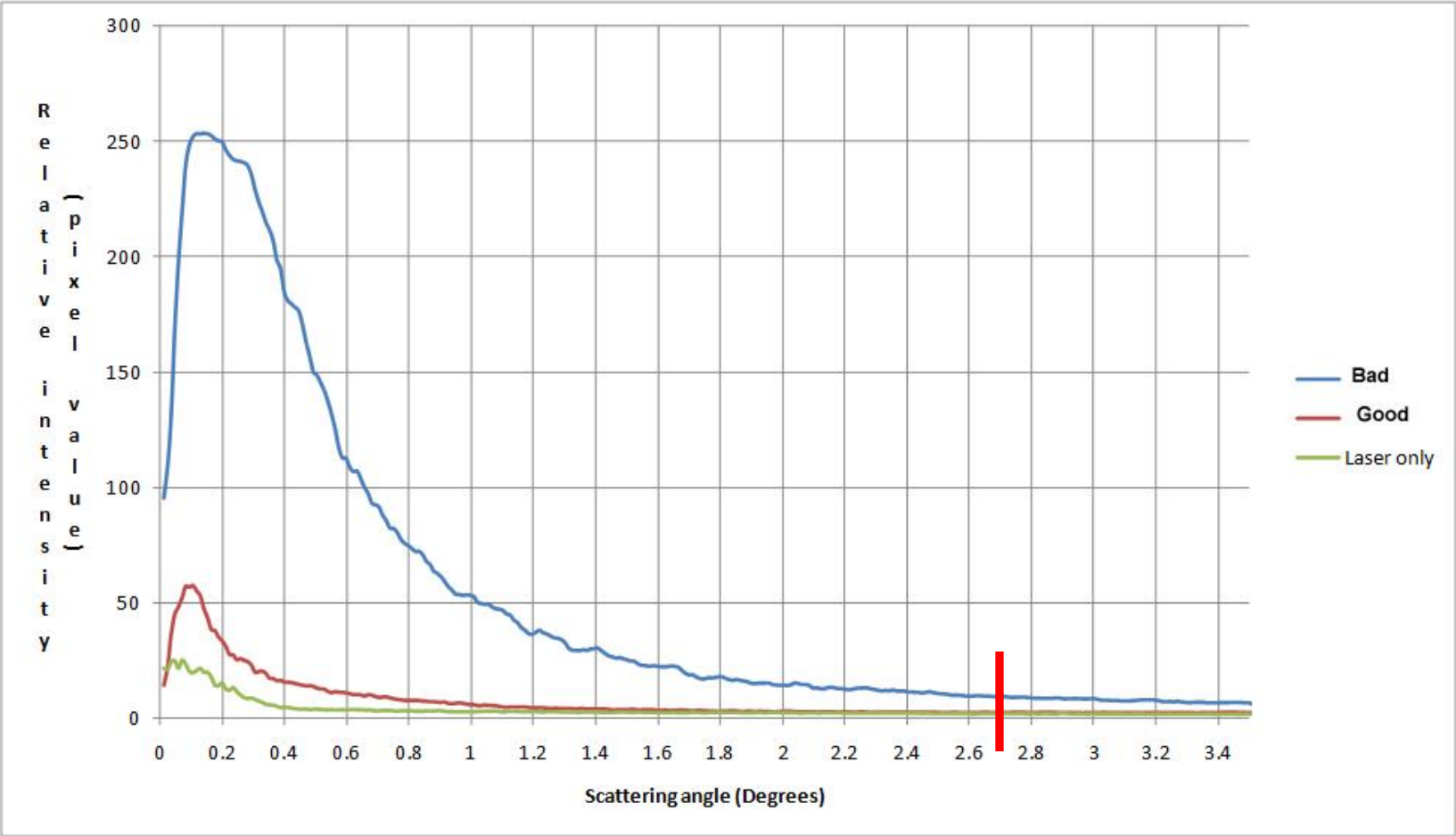
Good Film



Good Film (Radial Profile Plot)



Sample comparison



ImageJ resources

- Main ImageJ page:

<http://imagej.nih.gov/ij/>

- Radial Profile Plot:

<http://imagej.nih.gov/ij/plugins/radial-profile.html>

- Our websites:

- Image J manual
- History of Image document
- This PowerPoint presentataion (PDF)