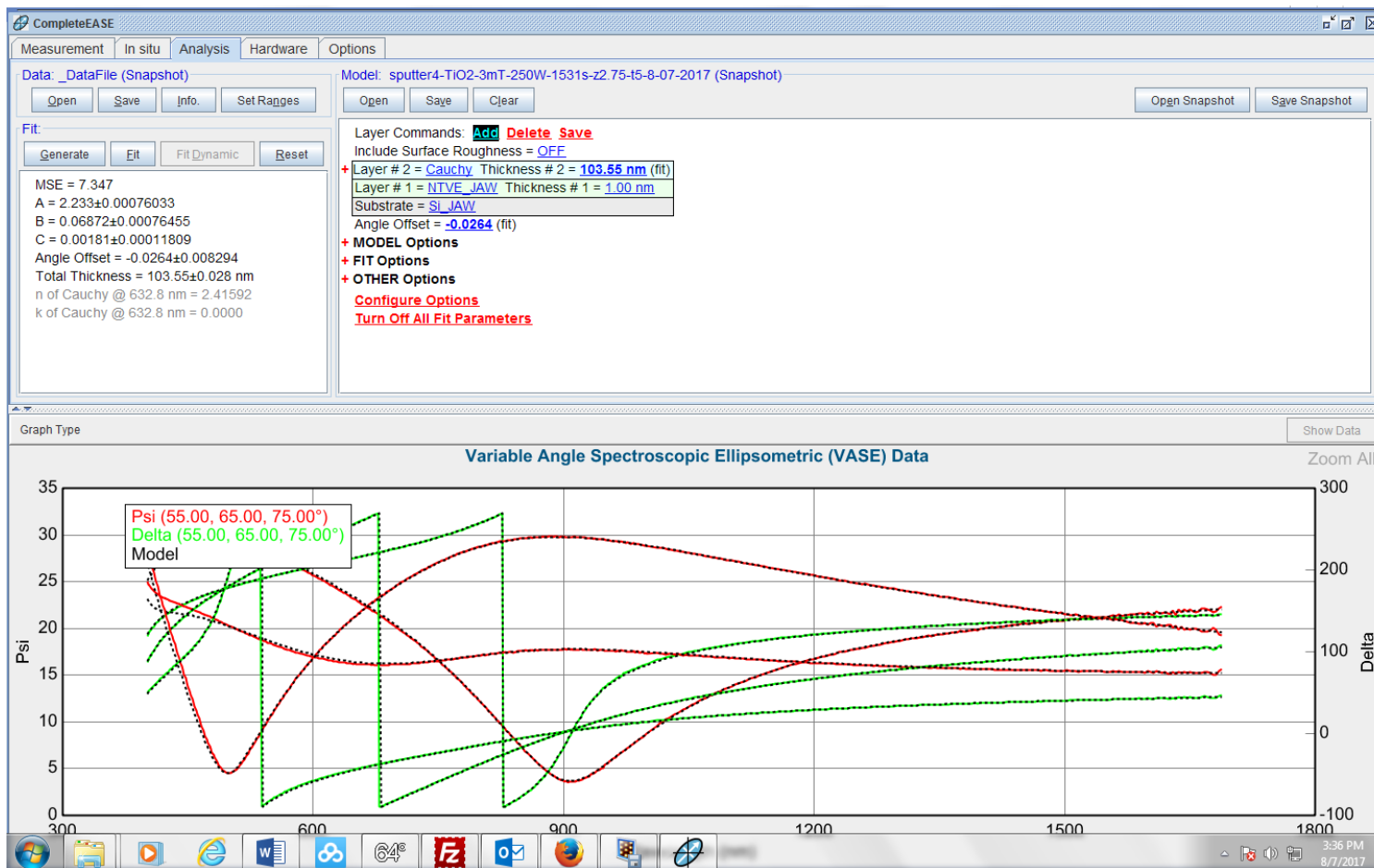
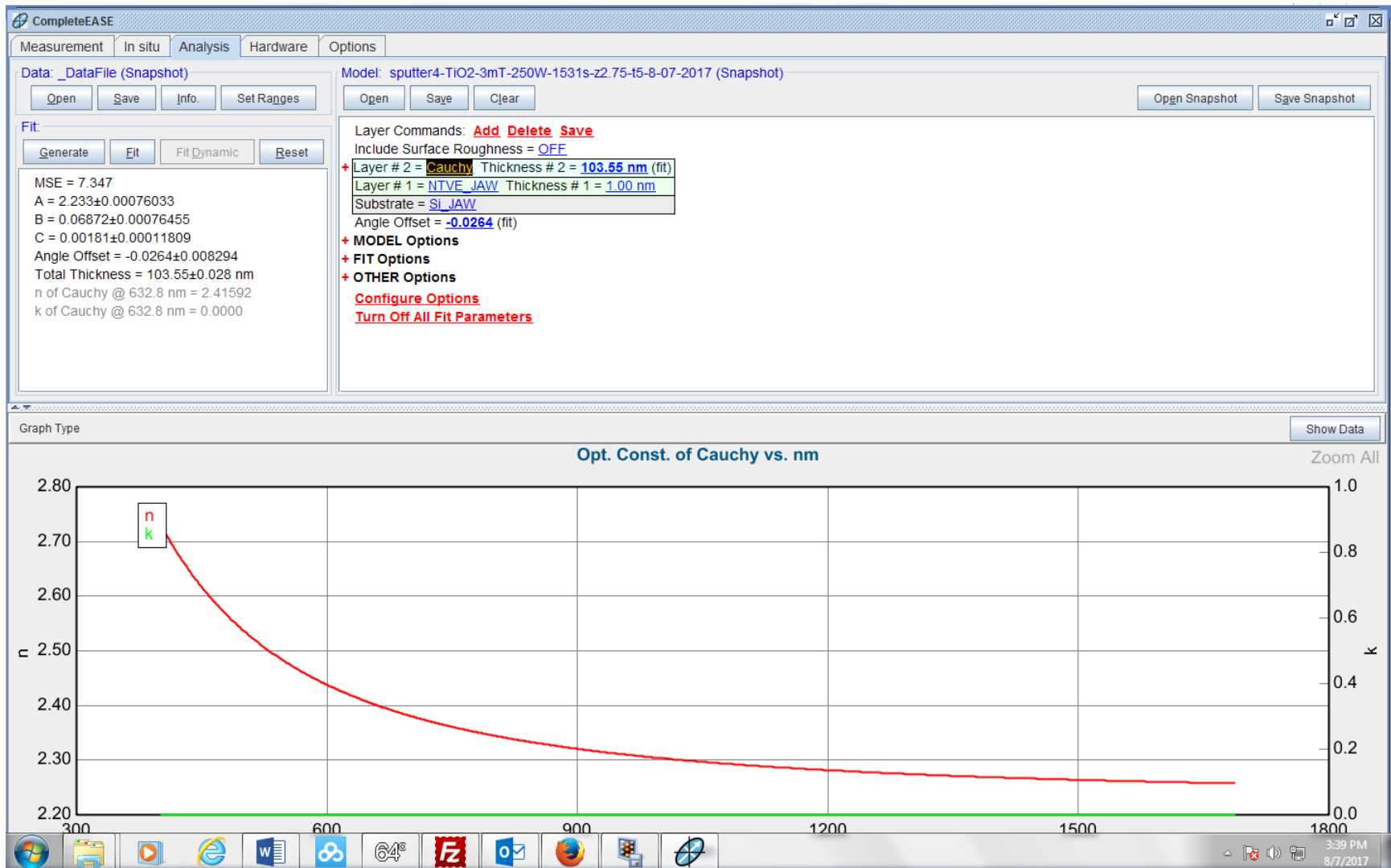


TiO₂ film using Sputter#4

- 1) Film sputtering Condition: Pressure=3mT, RF Power=250 W , O₂/Ar flow-rate=3/45 sccm, z=2.75, Gun tilting=5, rotation=10, and time=1531 s.
- 2) Ellipsometer Measurement: film thickness=103.55 nm.

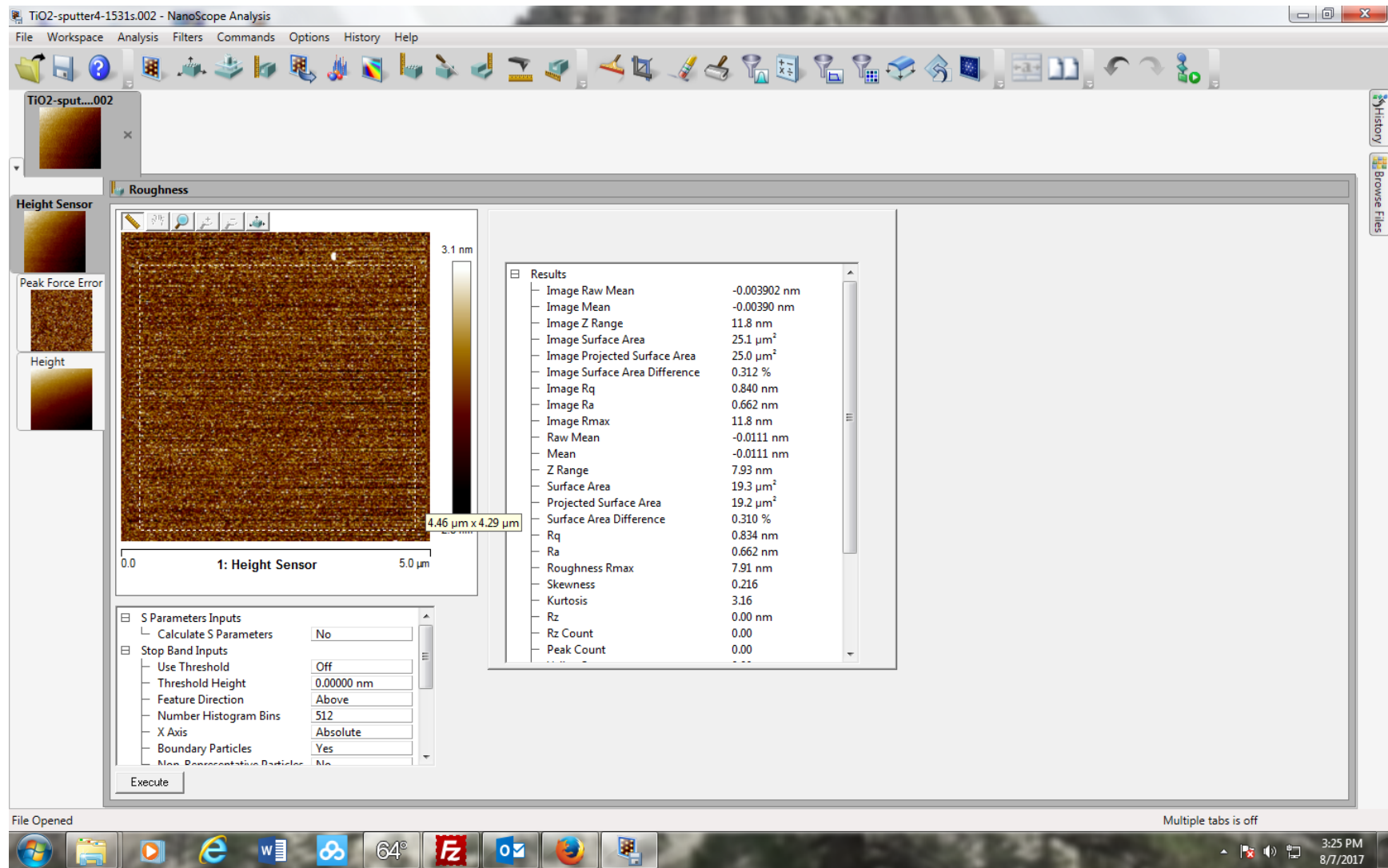




3) Sheet Resistance: $R=23.05 \times 10^6 \Omega/\text{sq}$, Resistivity= $238.7 \Omega\text{cm}$.

4)AFM surface Scan

Figure 1 (a) AFM surface scan of TiO₂(103.5 nm)/Si: Ra=0.662 nm; (b) AFM surface scan of Si substrate: Ra=0.208 nm. TiO₂ film roughness Ra=0.454 nm.



The screenshot displays the NanoScope Analysis software interface. The main window shows a topography image of a surface with a color scale ranging from 1.0 nm (dark) to -858.6 μm (light). The image is labeled "1: Height Sensor" and has a scale bar from 0.0 to 5.0 μm. To the right of the image is a "Results" panel listing various statistical parameters.

Results	
Image Raw Mean	0.055117 nm
Image Mean	0.0551 nm
Image Z Range	12.0 nm
Image Surface Area	25.0 μm ²
Image Projected Surface Area	25.0 μm ²
Image Surface Area Difference	0.0317 %
Image Rq	0.293 nm
Image Ra	0.213 nm
Image Rmax	11.9 nm
Raw Mean	0.0598 nm
Mean	0.0598 nm
Z Range	3.27 nm
Surface Area	16.4 μm ²
Projected Surface Area	16.4 μm ²
Surface Area Difference	0.0292 %
Rq	0.261 nm
Ra	0.208 nm
Roughness Rmax	3.25 nm
Skewness	0.0731
Kurtosis	3.20
Rz	0.00 nm
Rz Count	0.00
Peak Count	0.00
...	...

Below the image is a "Parameters Inputs" section with the following settings:

- Calculate S Parameters: No
- Stop Band Inputs
 - Use Threshold: Off
 - Threshold Height: 0.00000 nm
 - Feature Direction: Above
 - Number Histogram Bins: 512
 - X Axis: Absolute
 - Boundary Particles: Yes
 - Max Representation Particles: No

The Windows taskbar at the bottom shows the system clock at 3:28 PM on 8/7/2017.