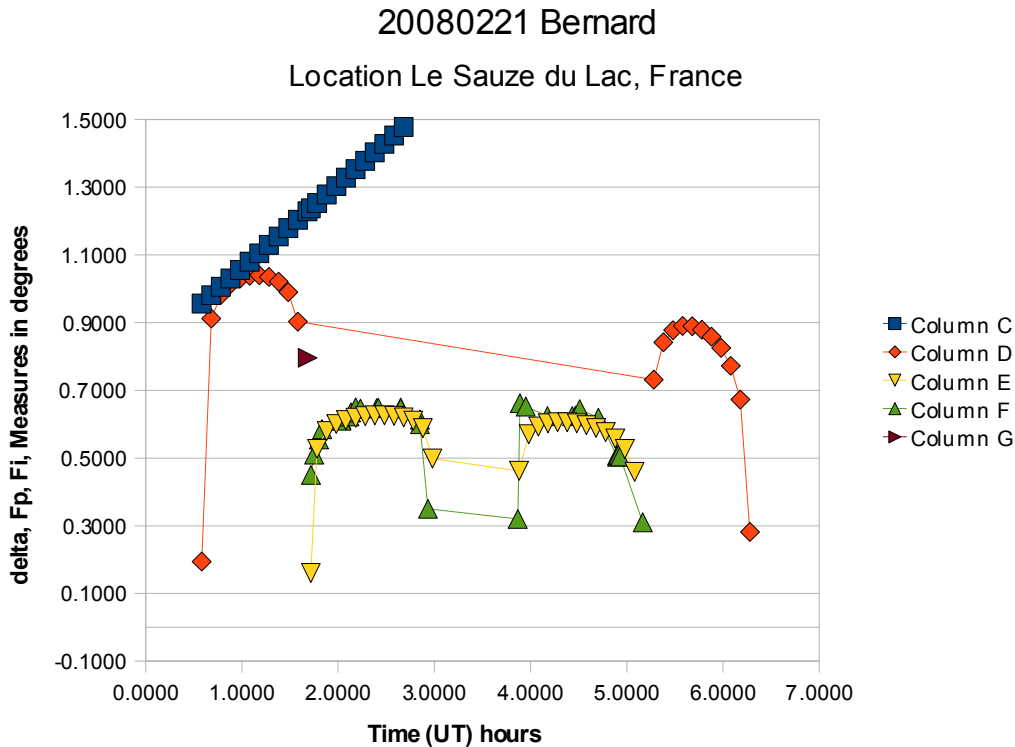


# Computed penumbra and umbra with umbra measures 20080221 for Bernard Durand



## LEGEND

Column **C** is the slant angle delta (part only shown)  
Column **D** is the computed topocentric penumbra (**F<sub>p</sub>**) in degrees  
Column **E** is the computed topocentric umbra (**F<sub>i</sub>**) in degrees  
Column **F** is the measured umbra from Bernard Durand's images (**F<sub>i</sub>**) in degrees  
Column **G** is the measured penumbra from Bernard Durand's image (**F<sub>p</sub>**) in degrees

## COMMENTS

The penumbra and umbra topocentric semi-diameters have been computed by program *ViaX8.exe* when their edges are traversing the Moon's surface.  
The observer's images have been calibrated to the Moon's semi-diameter and the images of the penumbra and umbra measured with *Digimizer*.

## CONCLUSIONS

There is excellent agreement with the image penumbra and umbra measurements when compared with the computed values for Bernard Durand's images (Column **G & F**) except for near third primary contact. The rapid increase and decrease of the umbra near all four primary contacts is clearly evident.