



Contribution ID: 177

Type: **Talk in the parallel session**

## **Solar astrometry at arcsecond level with a pencil, a meter and a watch at the Clementine Gnomon (1702)**

*Friday, 9 July 2021 09:00 (5 minutes)*

In this second contribution to the MG16 on Relativity's teaching, again on the meridian line of S. Maria degli Angeli, I publish the new tables of calibration of this meridian line in order to obtain a single measurement with absolute accuracy of 2-5 arcseconds. The lower limit of 2 arcsec is for winter observations with focal length of nearly 50 meters, while 5 arcsec is reached in summer with less than half of the length involved.

The pencil is used for signing the limbs' positions on the meridian line, the meter is sufficient to measure the distances of these limbs from the nearest reference point (there are 42 of them along the line), the watch synchronized with UTC is videorecorded along with the solar transit to get the single frame accuracy on contact's times. A timing accuracy down to 0.3 s is reached with the average air turbulences conditions. Examples on application of Cassini's and Laplace's corrections for air refraction on the observed data to obtain the real celestial coordinates of the date are presented.

This historical instrument gives the possibility to see the arcsecond, as half of a millimeter during winter, as no other instrument in the World, at the same time to many people. A set of nearly 200 transits video is also presented for remote observations during all year's seasons.

### References

Ingress of the Sun in Taurus 2021

Identifying Cassini and Laplace terms in atmospheric refraction at Santa Maria degli Angeli meridian line

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