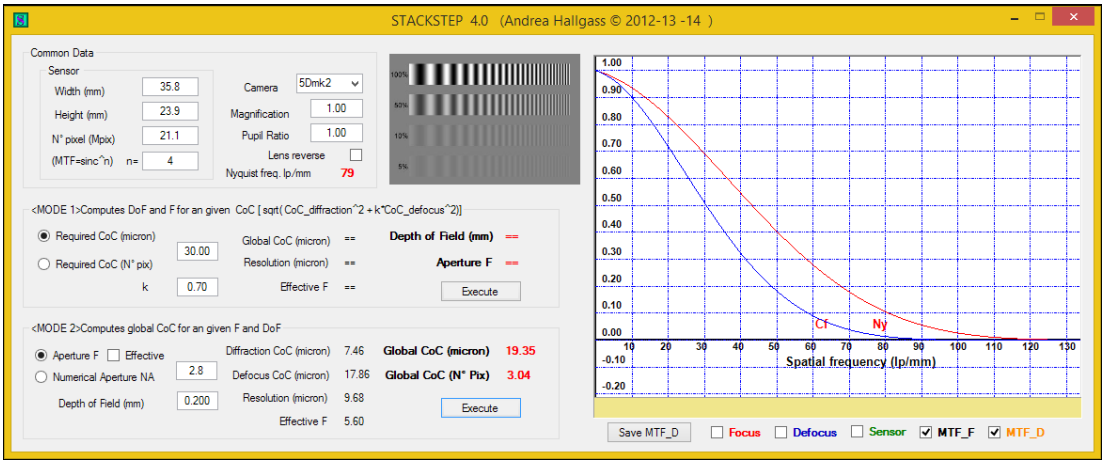
# STACKSTEP 4.0

The purpose of this program is the calculation of the aperture, depth of field and MTF graphs for the working conditions set.




STACKSTEP allows two ways of calculation:

**Mode 1**

In this mode are calculated the pair Aperture & Depth of Field so that the CoC diffraction is equal to k*CoC defocus

Input:

Desired Global CoC (diameter in microns or number of sensor pixels).

k = ratio between CoC_defocus & CoC_diffraction

Output:

Nominal Aperture & Depth of Field to obtain the COC set.

Effective Aperture.

Resolution (comes from a free interpretation of the Rayleigh principle and is calculated as R= 0.5 * CoC / Magification).

**Mode 2**

In this mode are calculated individual CoC and total CoC as a function of Aperture and Depth of Field selected.

Input:

Aperture: as nominal, effective or NA.

Depth of Field

Output:

CoC: due to diffraction and defocus.

Overall CoC

**MTF Graphs**:

**Ny** = Nyquist frequency of sensor

**Cf** = Estimated maximum frequency resolvable by the sensor

OTF_F & OTF_D: Are the OTF of the lens, respectively in the focus plane and in defocus plane at the limits of DoF side image.

*MTF equations for circle of confusion and diffraction: http://www.normankoren.com/Tutorials/MTF6.html*

*Depth of Field in Depth: http://www.largeformatphotography.info/articles/DoFinDepth.pdf*

Sensor: is the MTF due to the sensor calculated as [sinc ^ n]; n is set on the sensor data.

*MTF in Electro-Optical System: ftp://saturn.cis.rit.edu/mcsl/jaf/tenure/courses/1051-452_ISA_II/readings/readings_week7/lec07_boreman_ch2_400_ocrp.pdf*

MTF-F & MTF-D: Are the overall MTF, respectively in the foscus and defocus plane calculated as OTF_lens * MTF_sensor.

**Save MTF**: Format: <Frequency> <OTF_F> <OTF_D> <Sensor> <MTF_F > <MTF_D>