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 4.0 (Andrea Hallga	ass © 2012-13 -14) – 🗆 🗙
Common Data Sensor Camera 50mk2 on Width (mm) 35.8 Camera 50mk2 on Height (mm) 23.9 Magnification 1.00 on on N* poxel (Mpix) 21.1 Lens reverse hos os os (MTF-sinc^n) n = 4 Nyquist freq. (p/mm 79 55	1.00 0.90 0.80 0.70 0.80
	0.50 0.40 0.30 0.20 0.20
<mode 2-computes="" an="" and="" coc="" dof<="" f="" for="" given="" global="" p=""></mode>	0.10 0.00 10 20 30 40 50 60 70 80 90 100 110 120 130 -0.10 -0.20 Save MTF_D Focus Defocus Sensor ♥ MTF_F ♥ MTF_D

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

<u>OTF F & OTF D</u>: 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

<u>Sensor</u>: 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

<u>MTF-F</u> & <u>MTF-D</u>: 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>