

ILLUMINATION INHOMOGENEITY ANALYSIS PROCEDURE

A. Image acquisition

Place the pattern in order to make coincide the cross with the center of the field.

When setting the focus, make sure the cross and the rings are as distinct as possible. Intensity is maximum when focus depth is optimum. You can use the image histogram to set the focal depth.

Image dynamic is a key element in the analysis. We recommend saving the image using the best dynamic possible (12 or 16-bits).

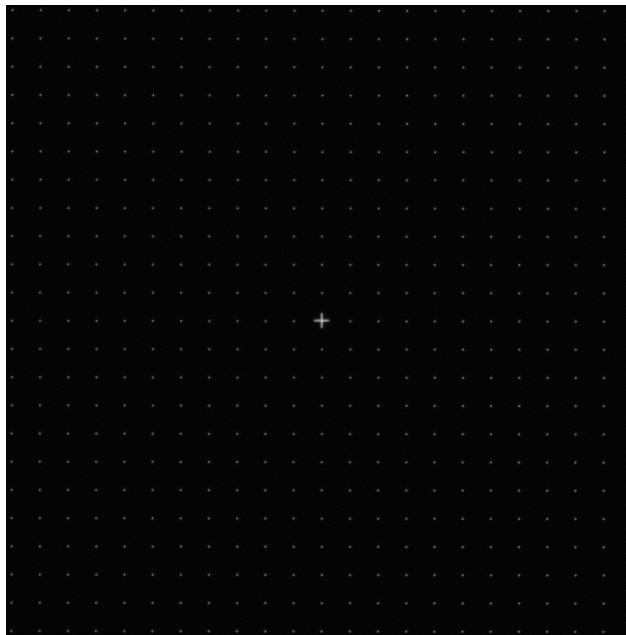


Figure 1 : Example of a field or rings image.

B. Daybook 1.2 analysis procedure

1. Select "Illumination inhomogeneity" in the list of analysis.
2. To proceed, click "Start the analysis".

Procedure to follow: Upload image > Select analysis > Select the image(s) > Start the analysis

Field distortion | **Start the analysis** | Normalized image On/Off

3. By default, if one of the rows (or columns) of rings is incomplete, the algorithm discards these rings from the analysis. If needed, click on "Crop" to crop the image as below. Once cropped, click on "Next".
4. Click on "Run" to run the analysis.
5. Results are displayed and can be saved.


C. Results

The intensity profile along the green line crosses the weighted centroid of the most intense areas and the minimum intensity of the homogeneity map.

You can draw your own intensity profile:

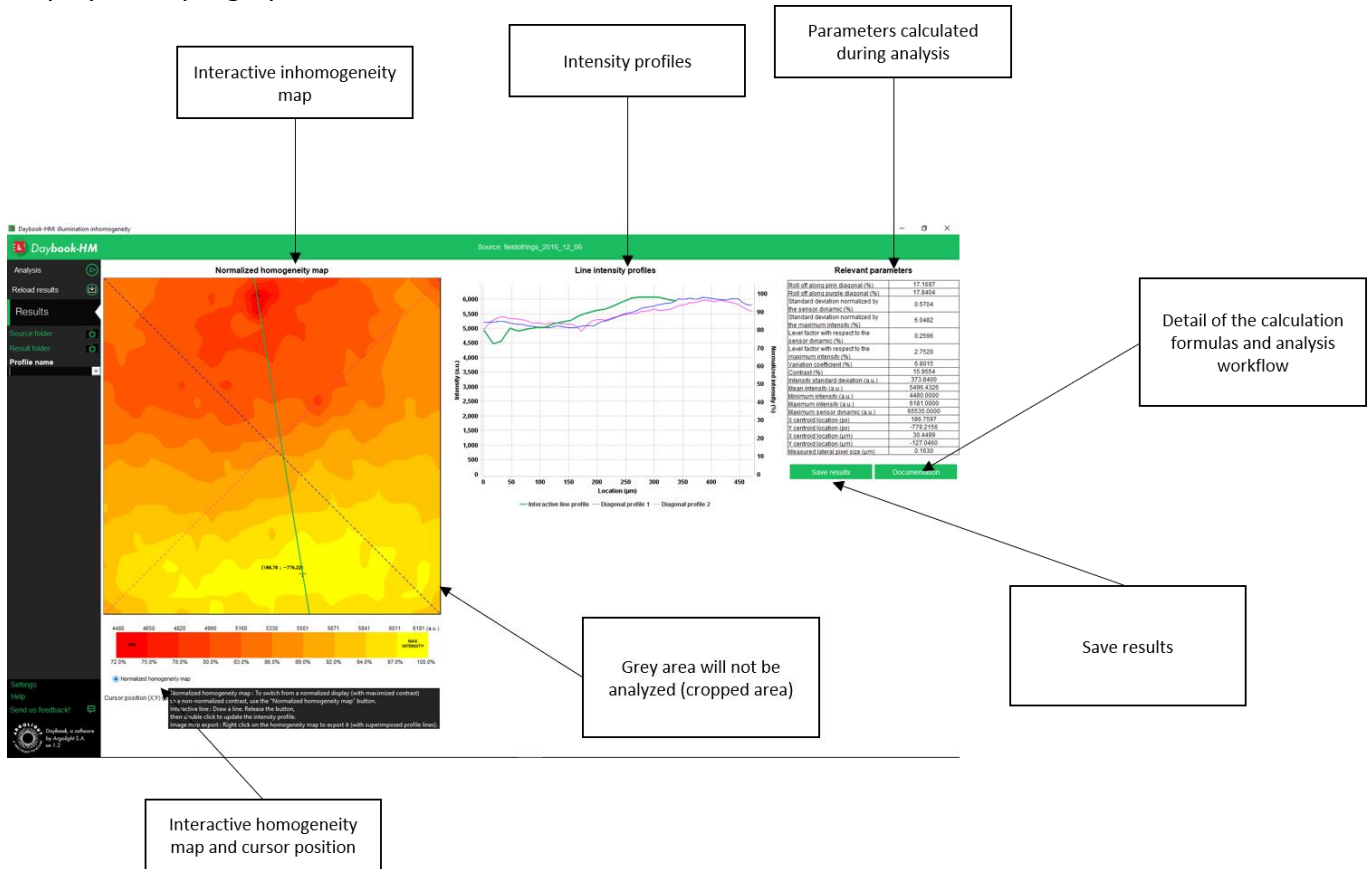
- First, place a reference. Click and hold the left mouse button to control the profile direction.
- Release the button, then double click to update the intensity profile.

Right click on the intensity profile graph to edit it. Fly over a curve with your mouse to see its main data. To switch from a normalized display (with maximized contrast) to a non-normalized contrast, use the “Normalized homogeneity map” button.

 Normalized homogeneity map

Right click on the homogeneity map to export it (with superimposed profile lines).

The picture below shows the results interface for this analysis, and useful information about the different displayed maps, graphs and tables.



The screenshot displays the Daybook-HM software interface with the following components and callouts:

- Interactive inhomogeneity map:** Points to the main heatmap on the left side of the interface.
- Intensity profiles:** Points to the line graph in the center showing intensity vs. location.
- Parameters calculated during analysis:** Points to the table of results on the right side.
- Detail of the calculation formulas and analysis workflow:** Points to the bottom right area of the interface.
- Save results:** Points to the 'Save results' button at the bottom of the parameters table.
- Grey area will not be analyzed (cropped area):** Points to a greyed-out region in the heatmap.
- Interactive homogeneity map and cursor position:** Points to the heatmap and the cursor location at the bottom left.

Roll off (diagonal, diagonal) (%)	17.5887
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Standard deviation normalized by the sensor dynamic (%)	0.5704
Standard deviation normalized by the maximum intensity (%)	0.5482
Line factor with respect to the sensor dynamic (%)	0.2596
Line factor with respect to the maximum intensity (%)	0.2520
Location coefficient (%)	0.6018
Contrast (%)	15.9514
Intensity standard deviation (a.u.)	373.6450
Mean intensity (a.u.)	3.4364302
Minimum intensity (a.u.)	0.44803000
Maximum intensity (a.u.)	633.930000
Maximum sensor dynamic (a.u.)	180.75587
Centroid location (mm)	279.2154
Centroid location (mm)	30.4489
Centroid location (mm)	127.6440
Measure of lateral pixel size (mm)	0.1630