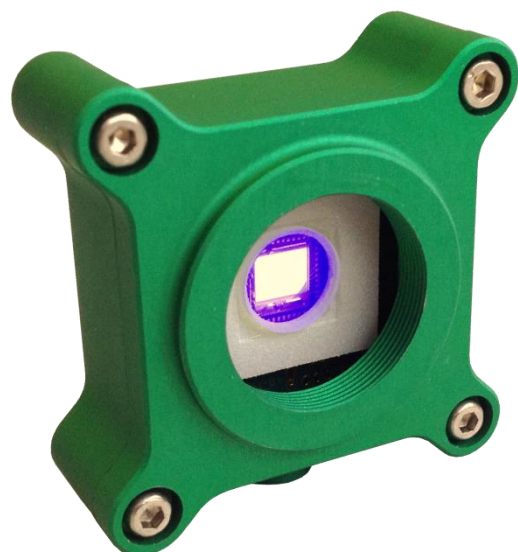


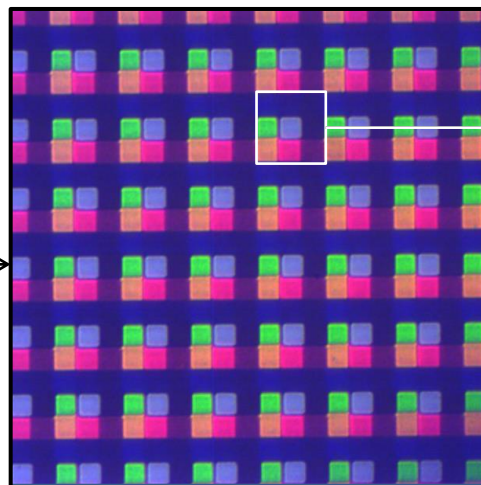
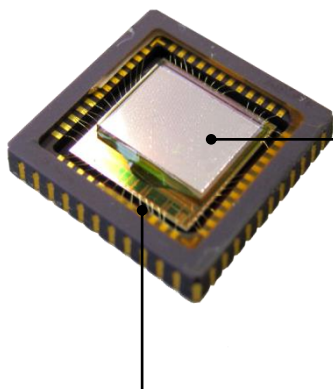


CMS-V Camera

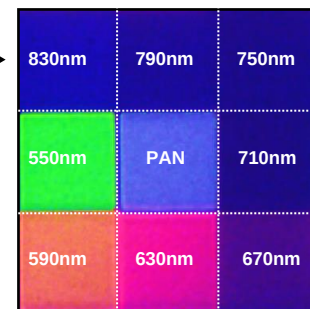
(wavelength range : 550-800 nm)

Chlorophyll Signature Detection

Camera CMS-V1



Macro-pixel



5.3 microns

Multi-spectral Sensor

=

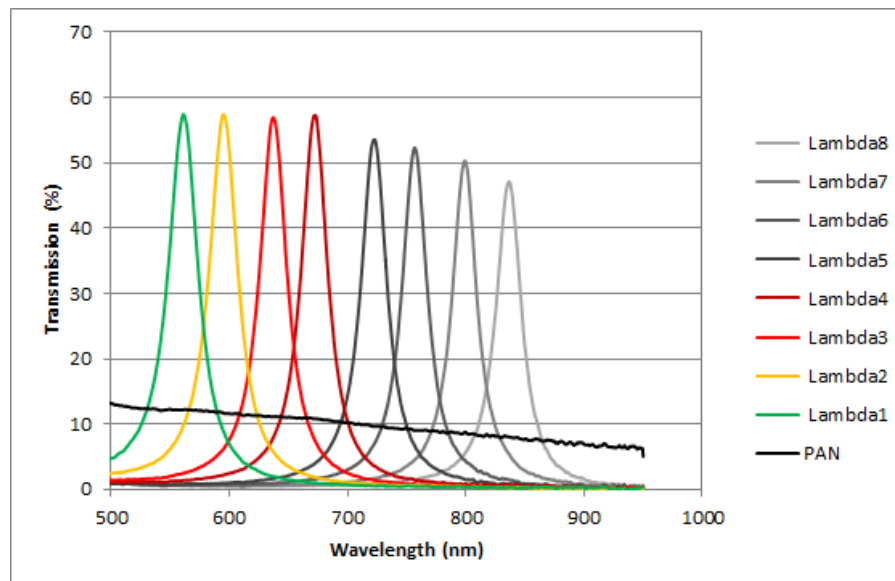
Multi-spectral filter

+

Commercial sensor

Ruby from e2v

Resolution : 1280x1024 (1.3Mp)



Chlorophyll detection :

Test 1 – leaf on a green pad

Test 1 : leaf on a green pad



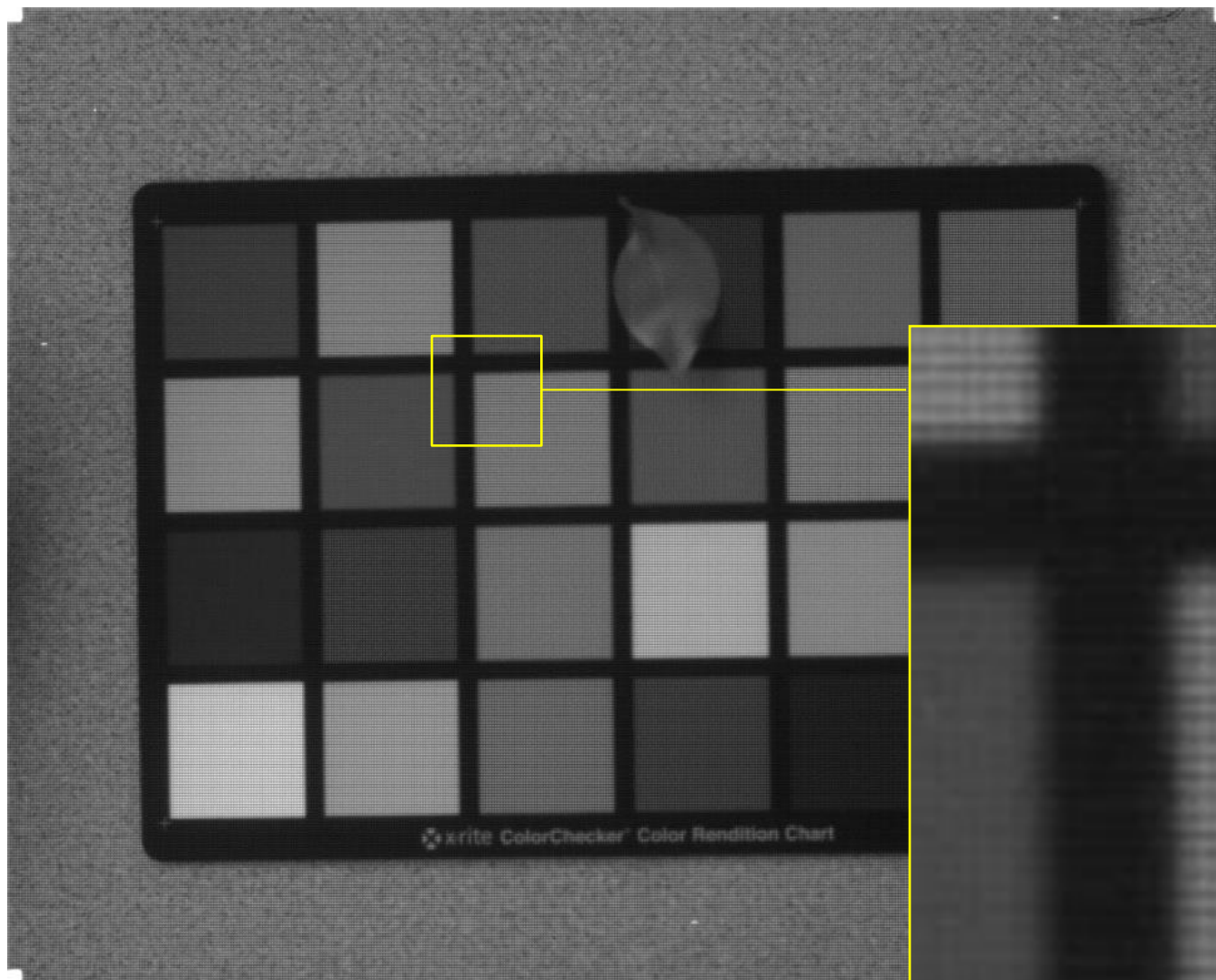
RGB picture

Iphone 4S

Demosaised picture

Res : 2789x2069 (5.8Mp)

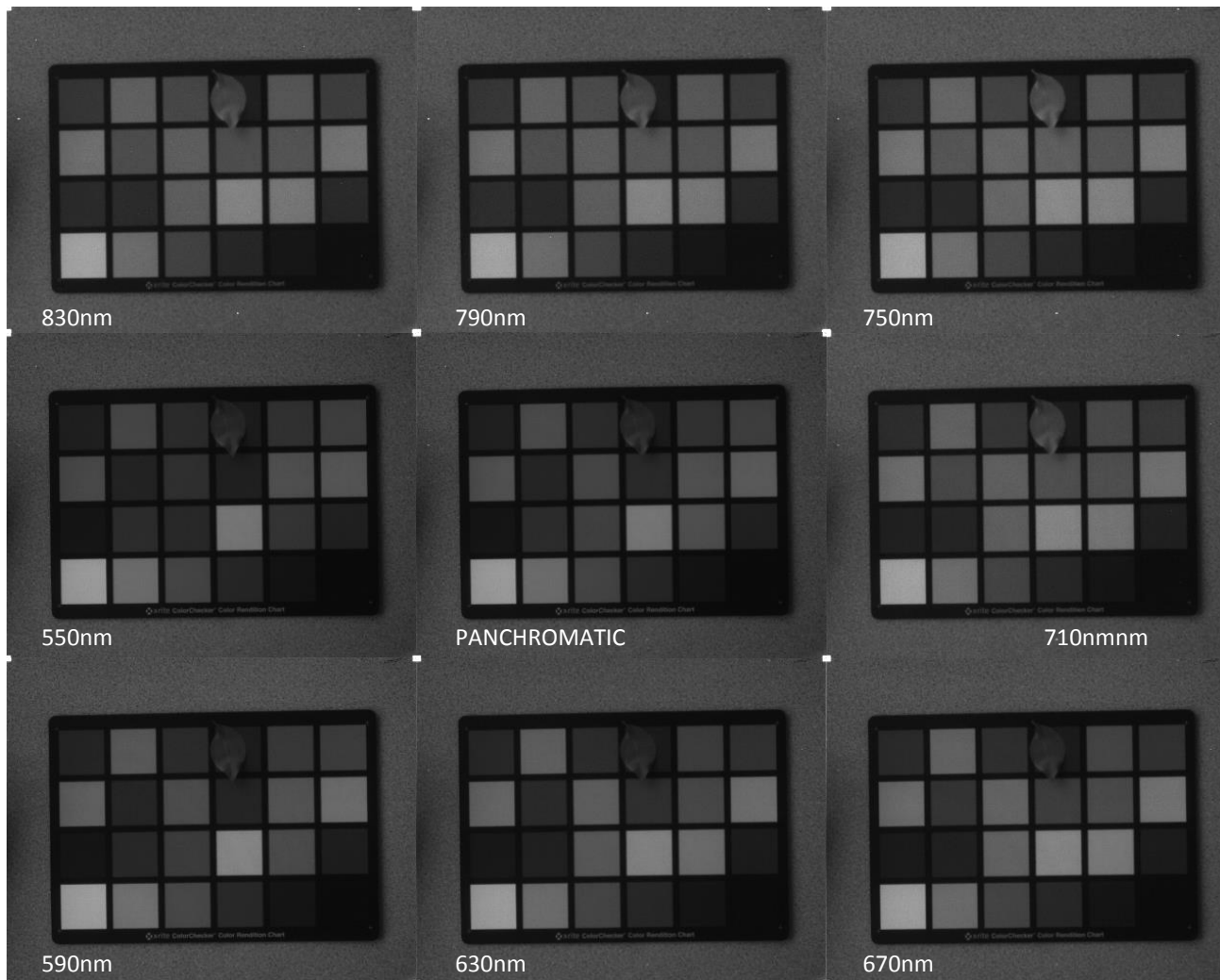
Test 1 : leaf on a green pad



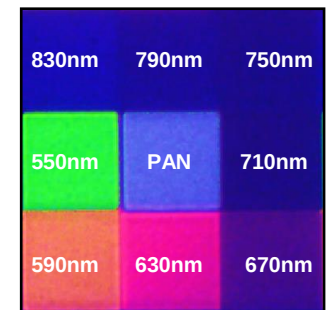
Multispectral picture
CMS-V
Raw picture
Res : 1280x1024 (1.3 Mp)

 Macro-pixel scale

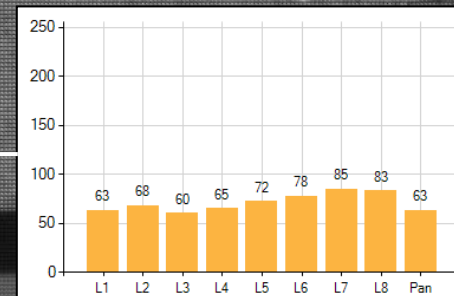
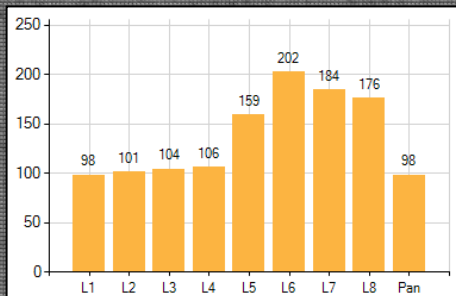
Test 1 : leaf on a green pad



Multispectral picture
CMS-V
"Single band" pictures
Res : 427x341 (0.15 Mp)



Test 1 : leaf on a green pad



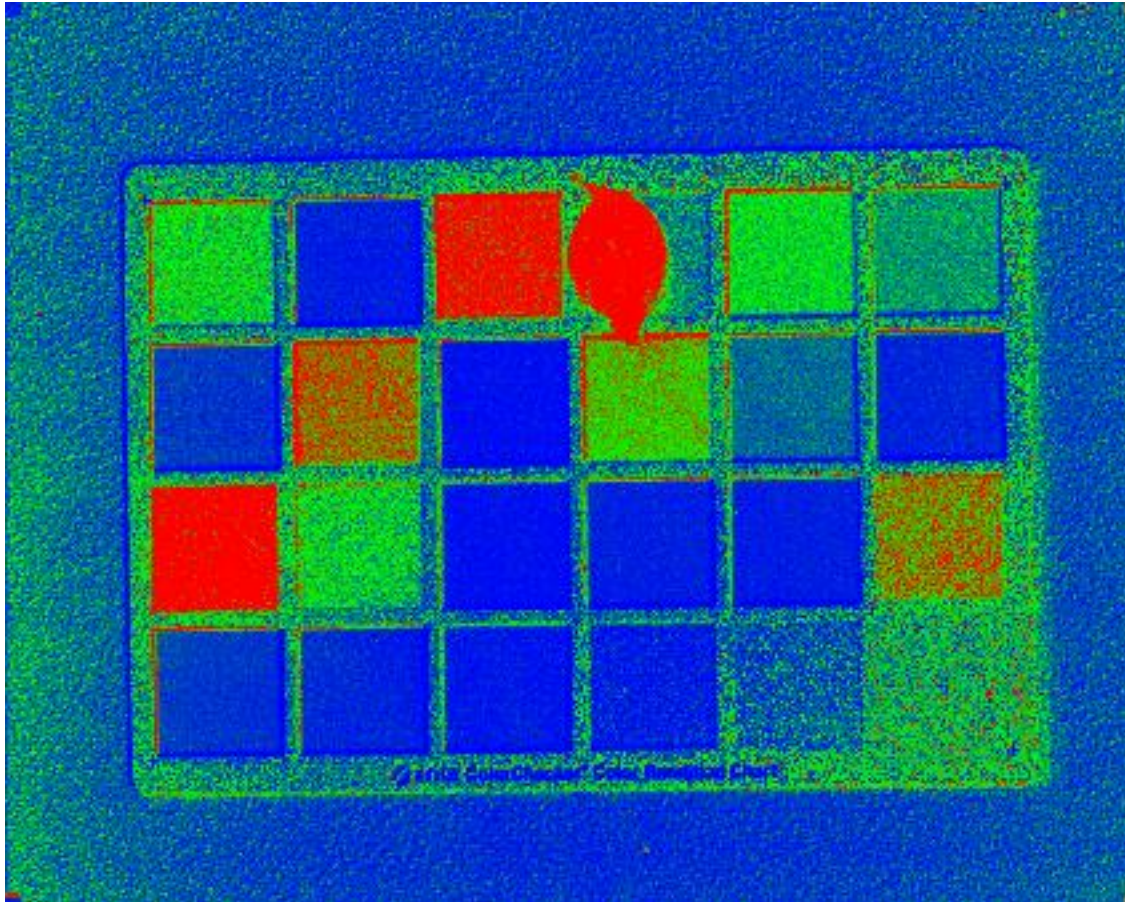
Test 1 : leaf on a green pad



Multispectral picture
CMS-V
False color treatment
427x341 (0.15 Mp)



Test 1 : leaf on a green pad

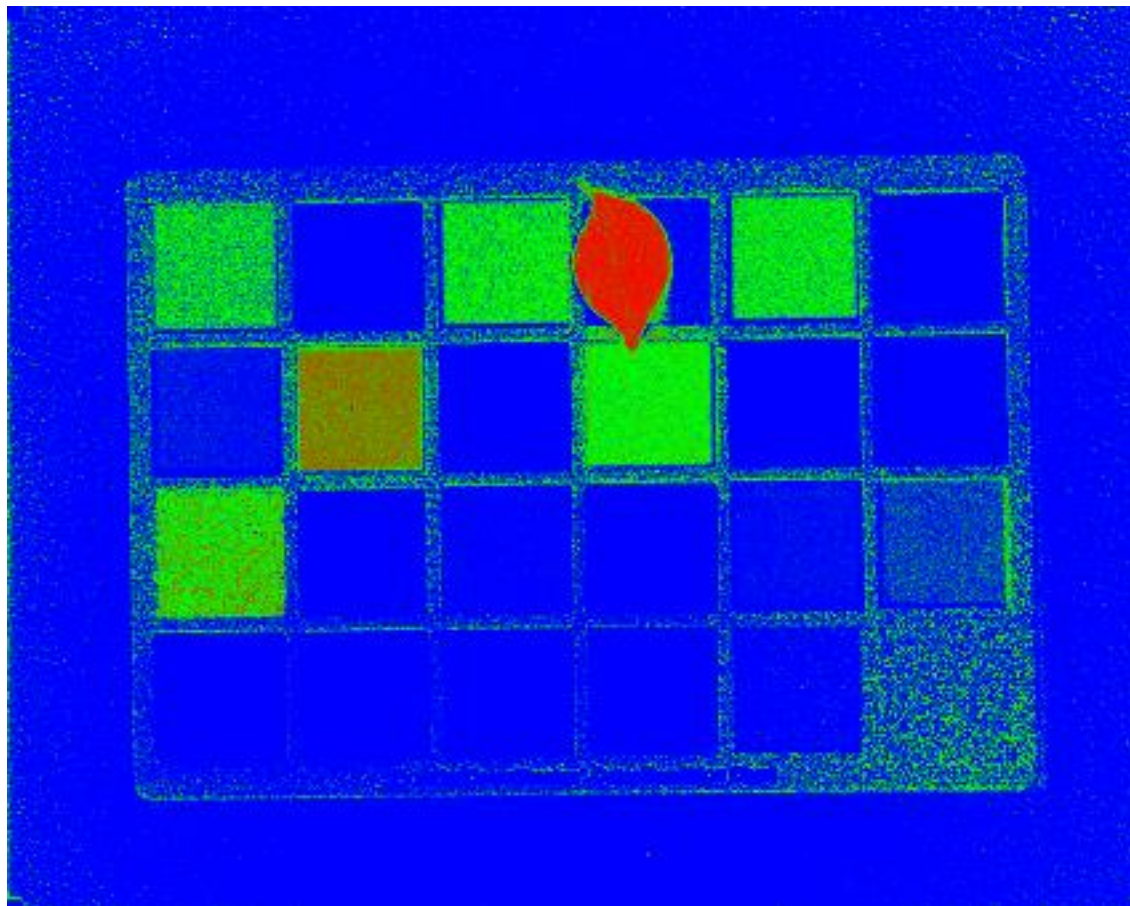


Multispectral picture
CMS-V
NDVI picture
427x341 (0.15 Mp)

$$\text{NDVI} = \frac{\text{Band 7} - \text{Band 4}}{\text{Band 7} + \text{Band 4}}$$



Test 1 : leaf on a green pad

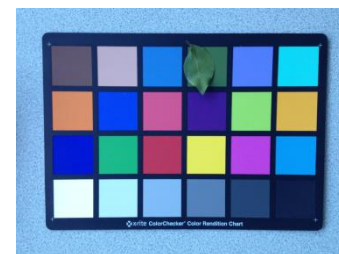


Multispectral picture
CMS-V

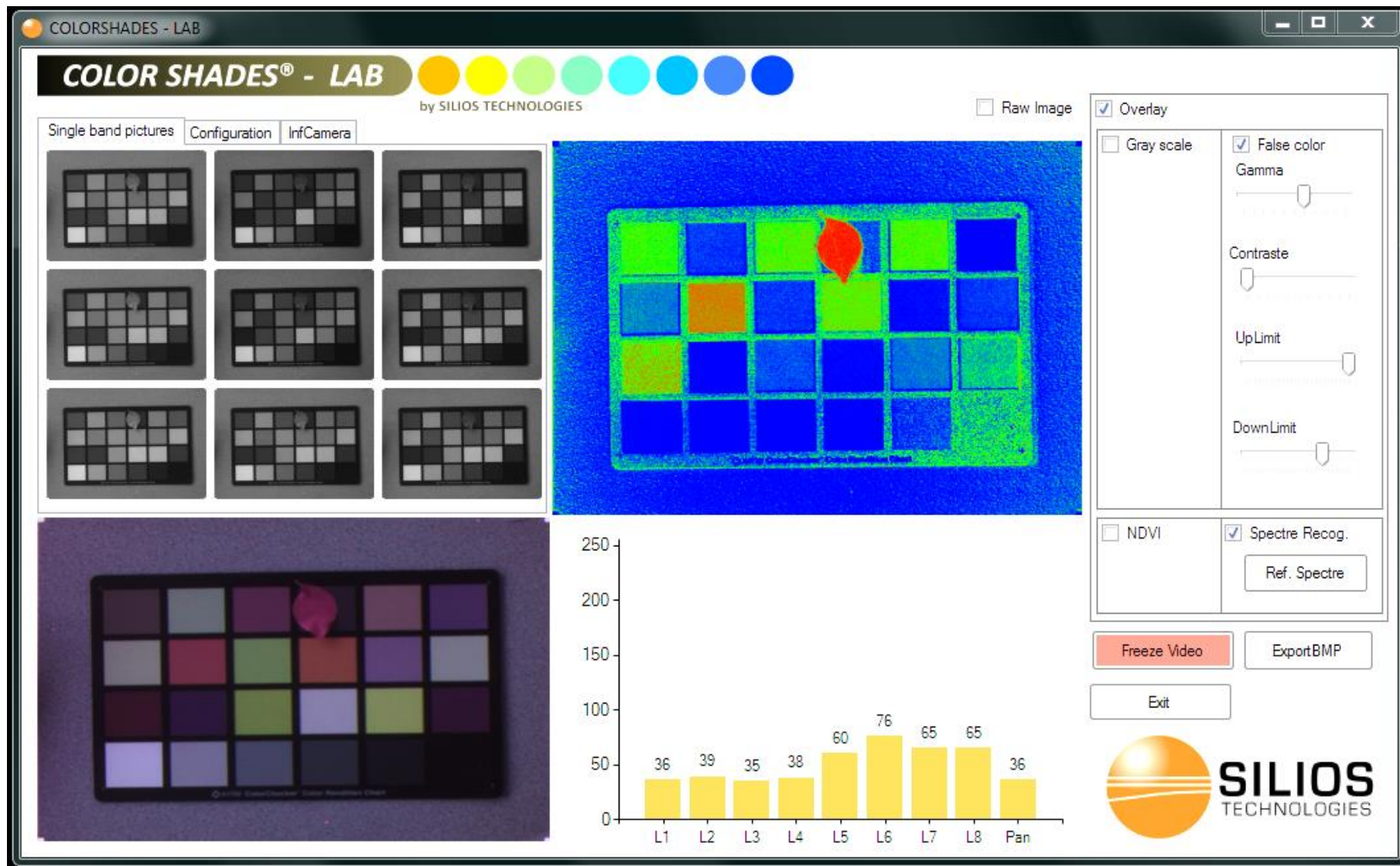
“Spectral gap” picture
427x341 (0.15 Mp)

The spectrum of the leaf is
chosen as reference spectrum.

The “gap” in between each
spectrum and the reference
spectrum is calculated and
displayed (blue : highest gap –
red : lowest gap).



Test 1 : leaf on a green pad



Chlorophyll detection :

Test 2 – outside scene

Test 2 : outside scene

RGB picture



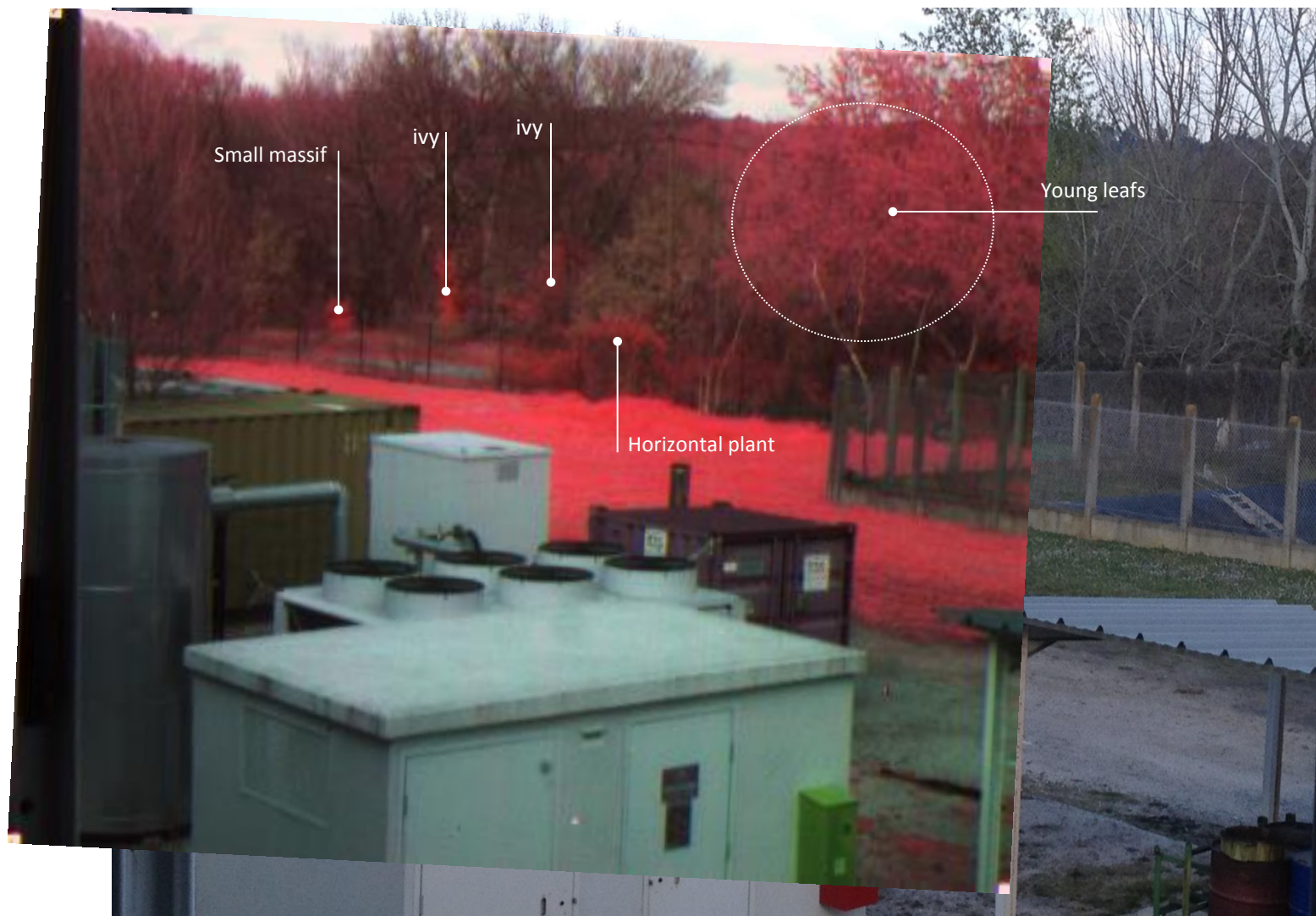
Test 2 : outside scene

RGB picture



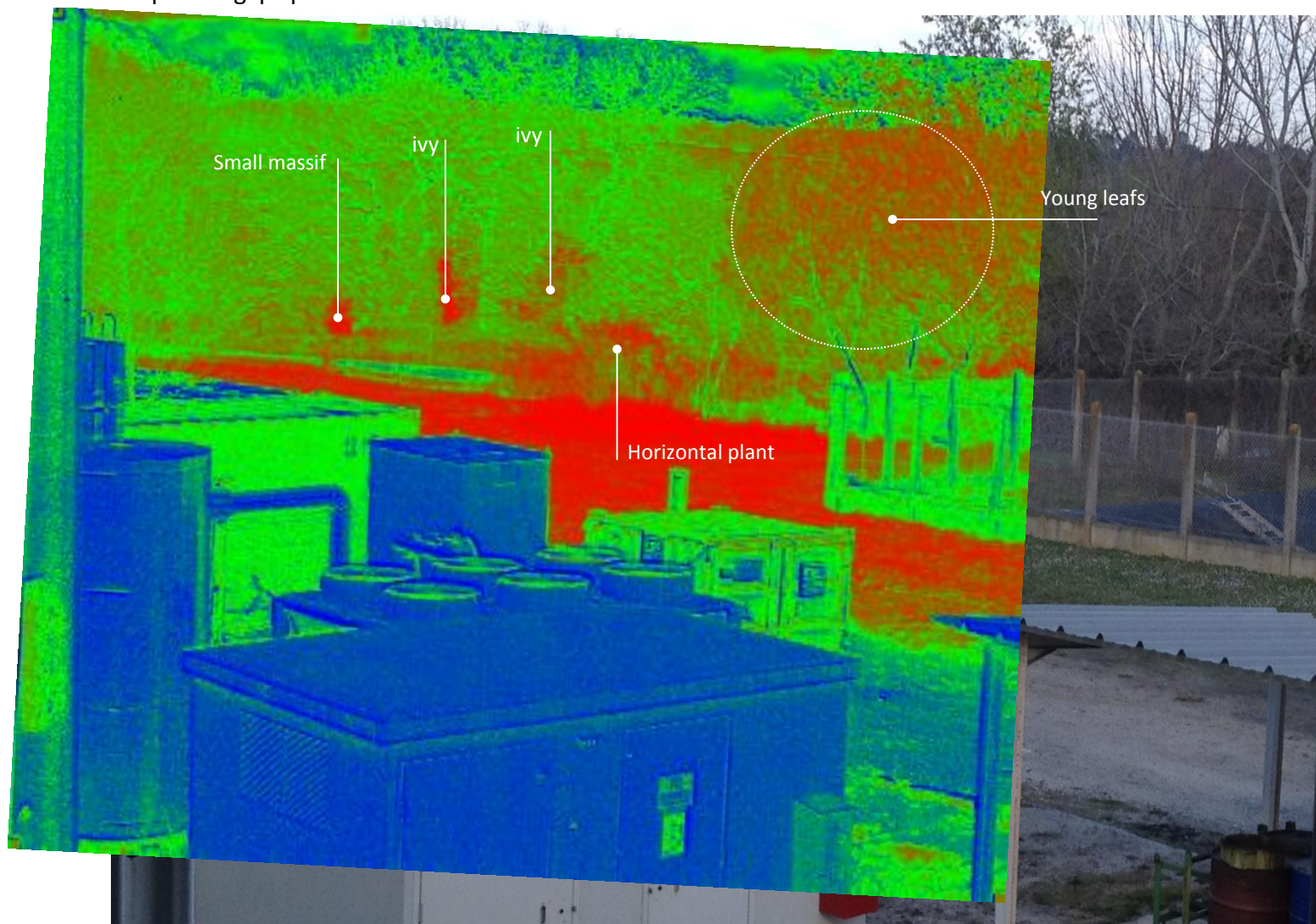
Test 2 : outside scene

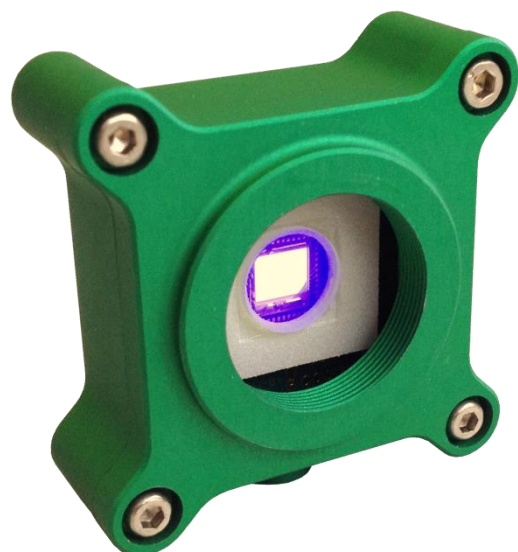
False color multi-spectral picture



Test 2 : outside scene

“Spectral gap” picture





CMS-V Camera

(wavelength range : 550-800 nm)

Chlorophyll Signature Detection