

# HS2I

## High Speed HyperSpectral Imager



This project has received funding from the European Union's H2020 research and innovation programme under grant agreement No. 824769-S3FOOD.

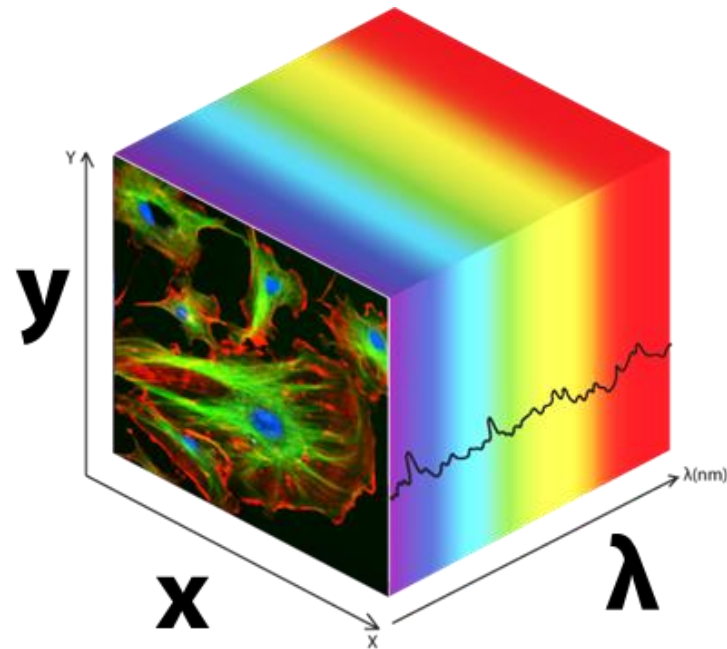
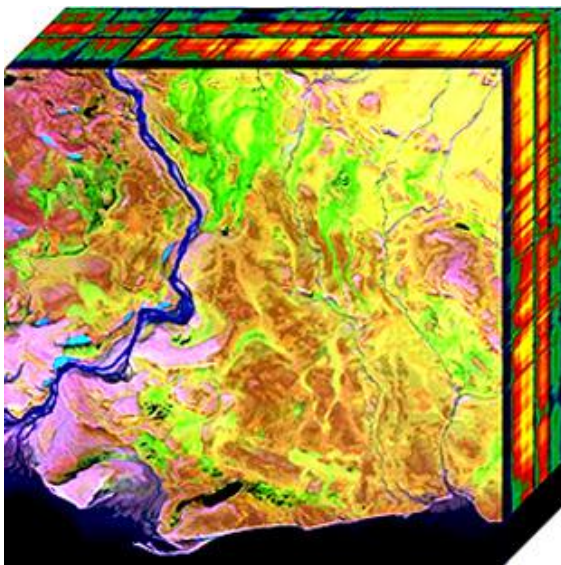


## Where digital imaging meets spectroscopy

**Hyperspectral imaging (HSI) is the combined acquisition of vision and spectral data with a single sensor**

The output from a HSI acquisition is called a datacube which can be viewed either as :

- a stack of images, each image being taken at a different wavelength over a continuous spectral range
- or
- a 3D dataset consisting in an image where each pixel contains a full spectrum over a continuous spectral range





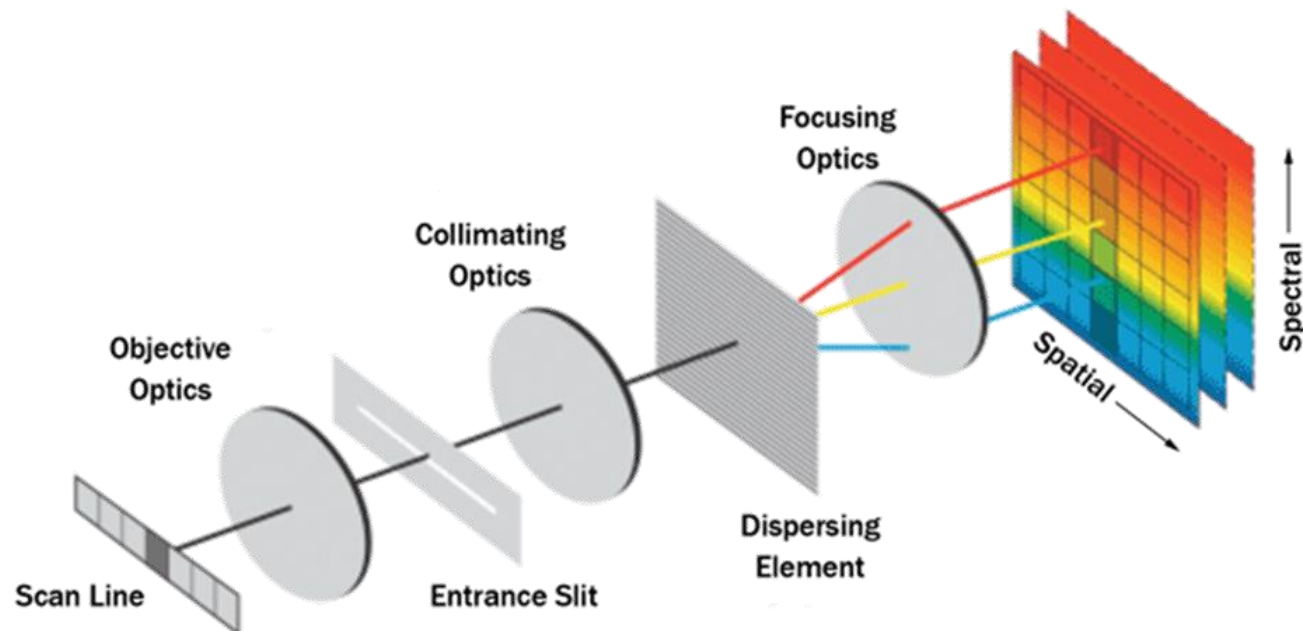
## Scanning HSI: performances without compromise

**Simultaneous acquisition of 2 dimensions (typically  $x$  and  $\lambda$ ) ; scan of the third dimension ( $y$ ) over time**

“Push-broom” scanning HSI is the leading technology on the HSI market as it enables obtaining the best possible performances in terms of spectral and spatial resolutions.

At a fixed time, a spatial line in the imaged field is acquired and dispersed into all its wavelength components on a sensor. The obtained “spectral image” of a single spatial line makes one slice of the final hyperspectral datacube.

Over time, the imaged field is spatially scanned line by line as the sensor builds the datacube slice by slice.





## Controlling food products beyond visible light

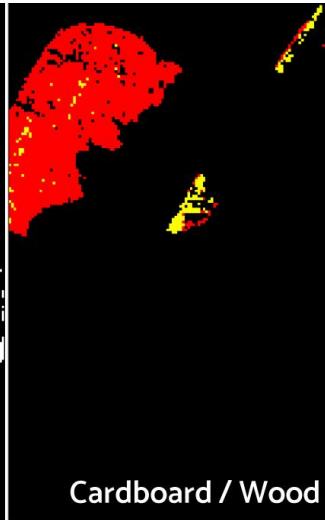
Foreign bodies detection, even in heterogeneous products



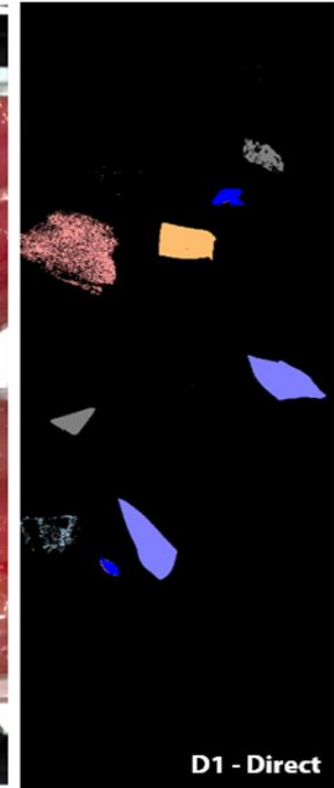
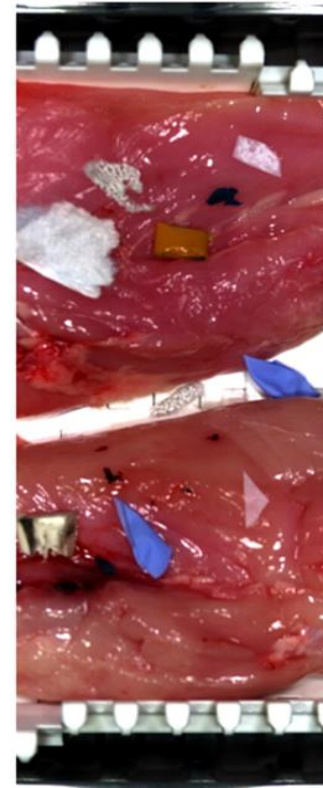
Paper



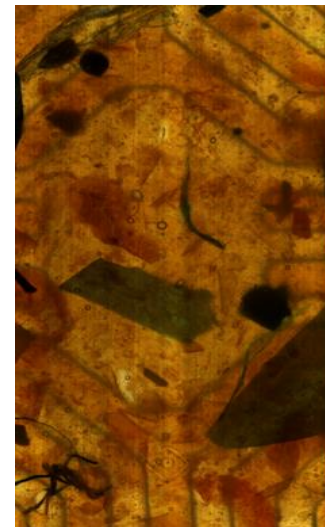
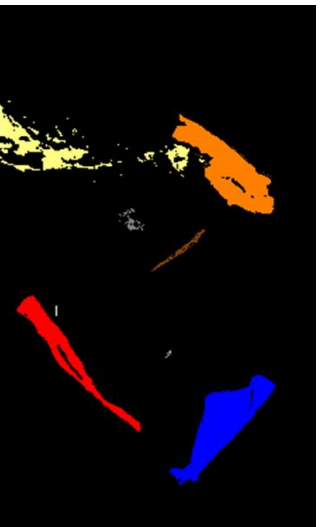
Plastic



Cardboard / Wood



D1 - Direct

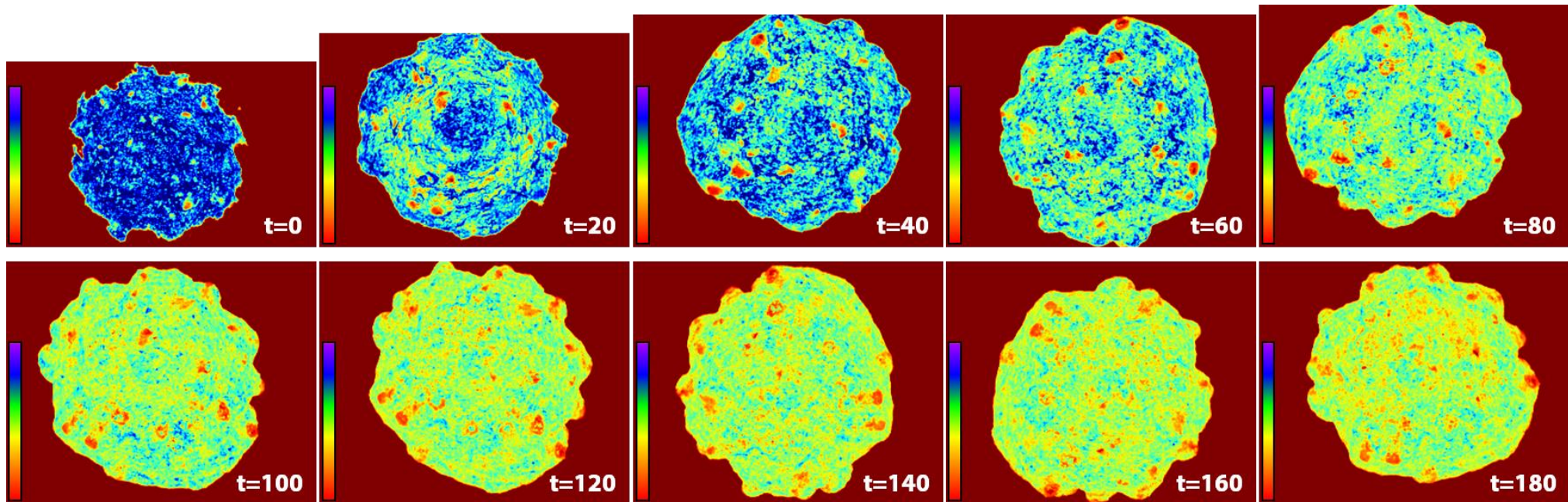




## Controlling food products beyond visible light

Advanced monitoring of industrial food process

Ex: Spatial mapping of the cooking process over time in biscuits





## HS2I: HyperSpectral imaging... at high speed

**Speed is currently the main technically limiting factor slowing down the implementation of HSI in the industry**

By combining today's HSI technology with the high-speed digital imaging technology, Photon Lines aims at developing an obvious suitable solution for many strong yet unanswered needs in the agri-food industry.



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