

Fujifilm develops high-performance multispectral camera system

- Visualizing information that the human eye cannot identify, offering broad applications including quality inspection in production lines and observation of crop growth
- Adopting the polarization system for the first time in the world to deliver high-definition images
- Capturing spectral image up to 9 wavelength bands simultaneously and presenting it visually in real time

Tokyo, July 9, 2020 — FUJIFILM Corporation (President: Kenji Sukeno) is pleased to announce the development of a high-performance multispectral camera system, harnessing Fujifilm’s optical technologies and cutting-edge image processing technologies nurtured over many years. This is the first multispectral camera in the world to adopt the polarization system*¹, capable of simultaneously capturing spectral image up to nine wavelength bands in high definition and presenting the image in real time. The system produces the images to visually present information that cannot be identified with the human eye. Applications include highly efficient and highly accurate quality inspection in production lines, and the identification of detailed growth status for agricultural crops, thereby contributing significantly to productivity improvement.



Newly-developed multispectral camera system

*1 A system based on light oscillating in a specific direction (polarization)

Light is composed of various ranges of wavelength (spectrums). Individual objects have different spectrums of light that is strongly reflected. A multispectral camera captures light of specific wavelengths reflected from a target object to visually present information that the human eye cannot identify. For example, at a production line, such a camera system can be used for quality inspections by visualizing the spectrum of light most suitable for detecting contamination. At agricultural sites, the camera can help observe crop growth by capturing the spectrum of light that reflected strongly against chlorophyll, which is essential for photosynthesis. The multispectral system can achieve such monitoring at a higher level of efficiency and accuracy than general cameras based on three primary light colors (RGB) or experienced workers do. Thus, there are high expectations for the applications of multispectral camera systems in a wide range of industries. In response, Fujifilm has developed a multispectral camera system based on the polarization system, tapping into its optical technology, nurtured through the development of 4K / 8K broadcast lenses and a wide range of other lens products, as well as the cutting-edge image processing technology nurtured through the development of the GFX / X Series of digital cameras.

<Features of the all-new multispectral camera system>

- High-performance multispectral camera system is equipped with a lens fitted with newly-developed filters, a polarization image sensor that can capture specific directional polarization image, and a cutting-edge image processing function. This system can simultaneously record images of different wavelength ranges in high definition and presenting them in real time.
- The newly-developed filters serve as “polarizer” that lets light in a specific direction of polarization pass through as well as “optical bandpass filter” that passes light of a specific wavelength range. The system uses three filters to split light into up to nine wavelength bands, while also polarizing the light of each wavelength band into a specific oscillation direction. (Figure 1)
- The polarization information of light in each wavelength band that has passed through the filters is

recorded by the polarization image sensor and applied with the cutting-edge image processing function for visual presentation in high resolution and at a high frame rate (Figure 2). The system also allows users to choose an optical bandpass filter of the optimum wavelength band for their monitoring object.

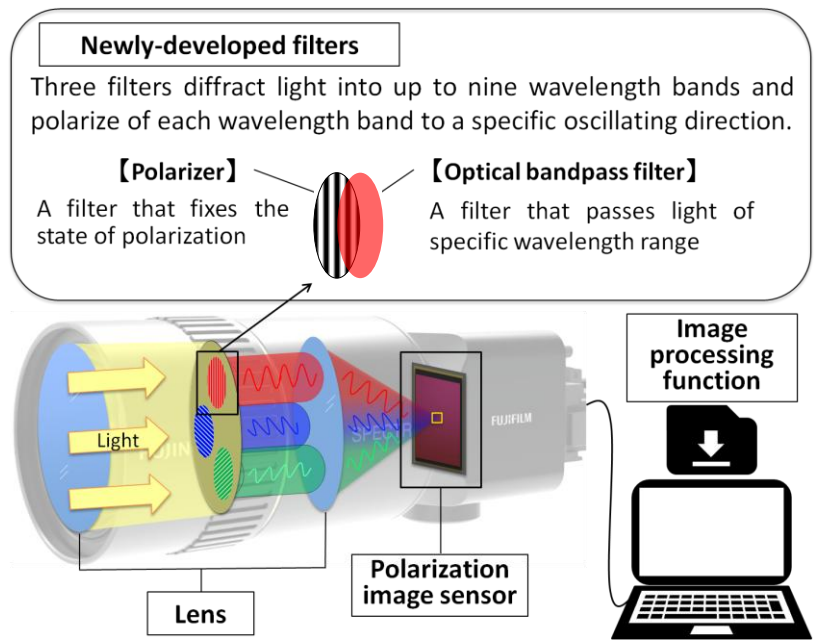
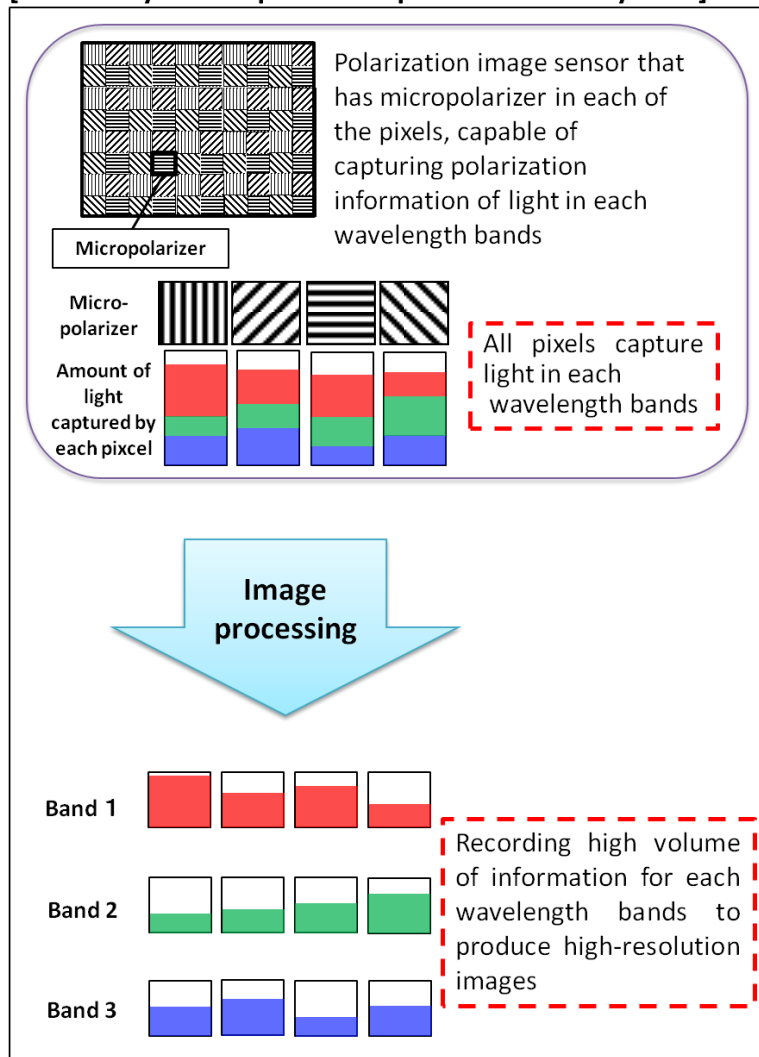


Figure 1: Structure of the newly-developed multispectral camera system

[The newly-developed multispectral camera system]



[Conventional system (on-chip filter type)]

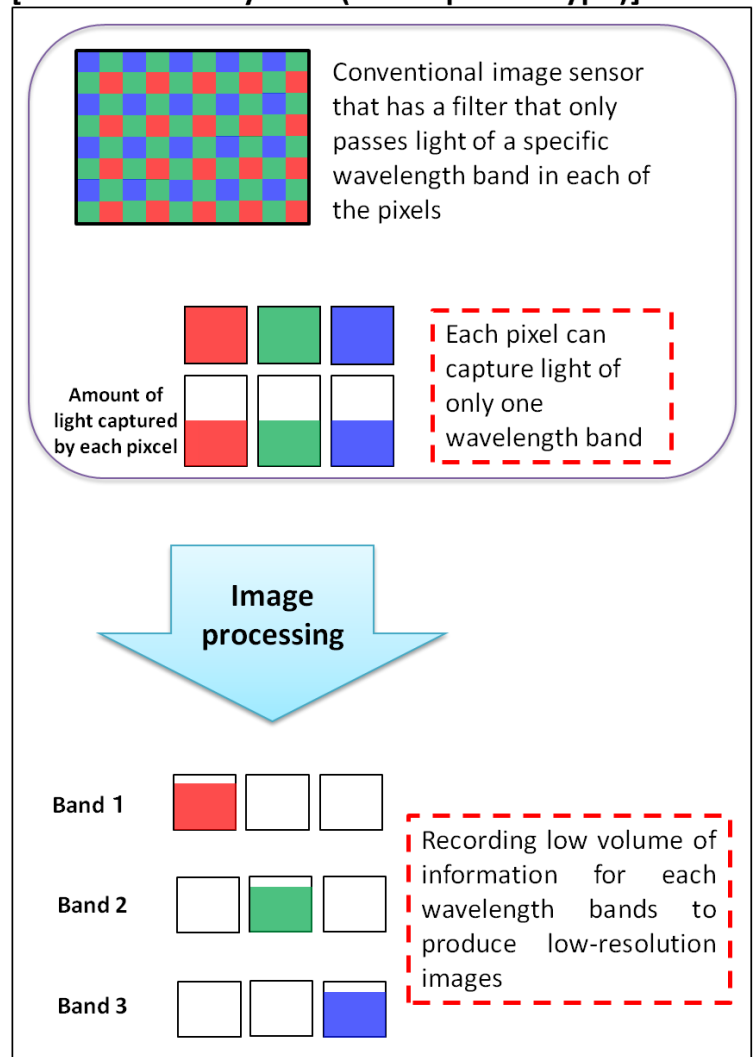
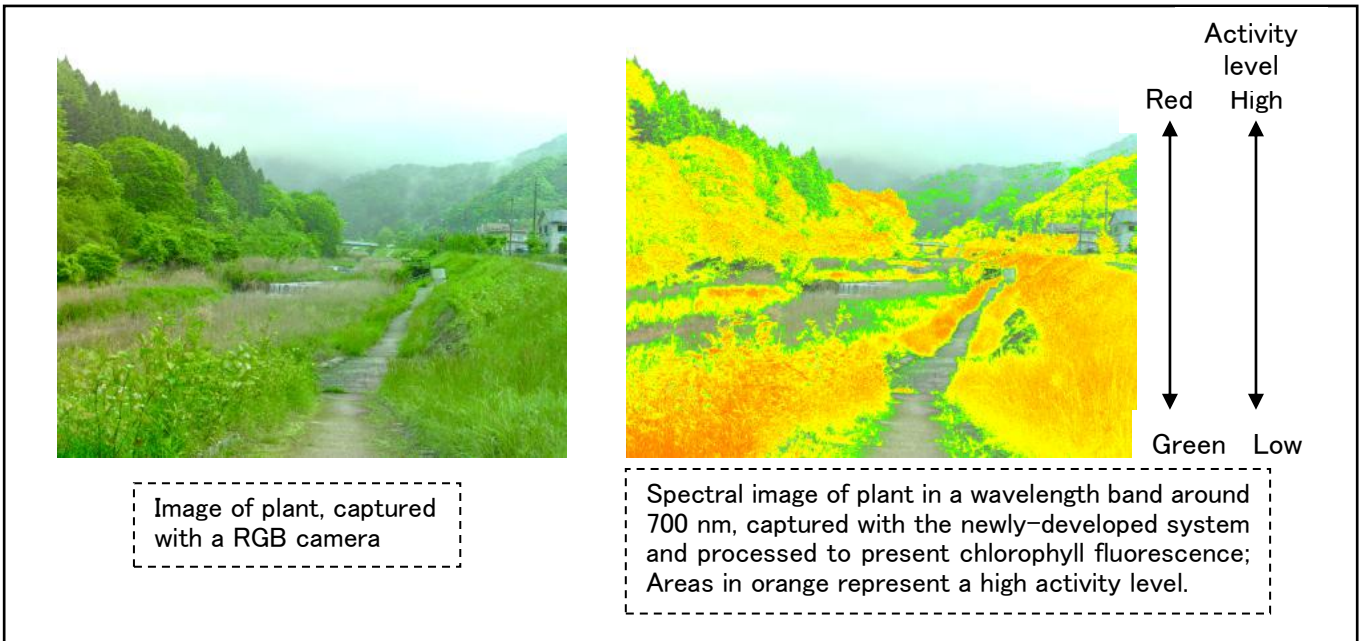


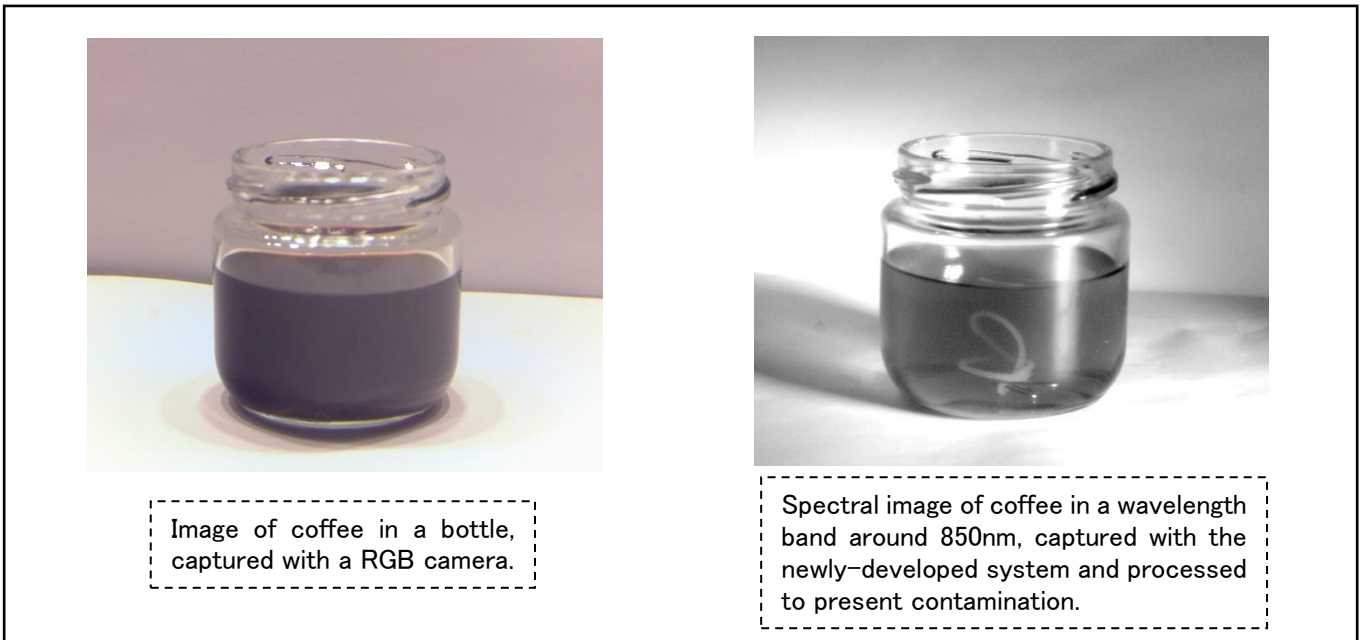
Figure 2: Comparison between the newly-developed multispectral camera system and a conventional camera system

〈Examples of spectral image captured by the new multispectral camera system〉

①observation of plant growth



②Detection of Contamination



Fujifilm engages in R&D, manufacturing and marketing of a variety of FUJINON lenses including broadcast lenses and cine lenses. Fujifilm is expanding its optical device business by introducing projectors equipped with the world's first two-axial rotatable lens and 40x long-range surveillance cameras that cover up to the world's longest*2 800 mm focal length. The company will continue to develop innovative products that meet diverse market needs so as to achieve further business growth.

*2 Among lens-integrated long-range surveillance cameras as of July 9, 2020 according to Fujifilm

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