Tohoku Univ. Technology

Spectrometer that can reduce stray light intensity to below 1/1000

Able to detect wide range signal from near-ultraviolet to near-infrared with good S/N ratio

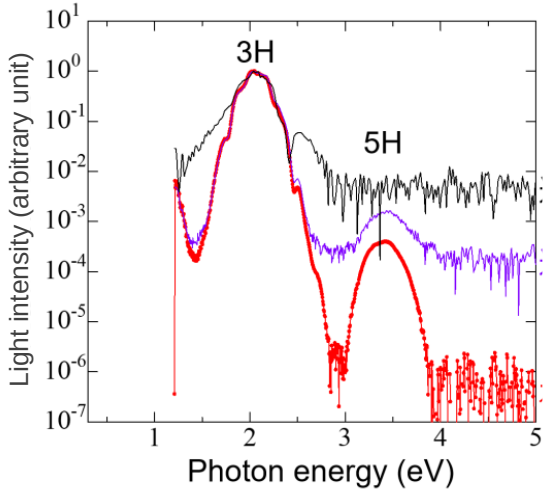
Overview

During spectroscopy, various stray light over a wide wavelength range is generated due to the effect of the 0th order reflected light, the 2nd order diffracted light and other scattered light generated in the spectrometer, in addition to the 1st order reflected light of the input light. In particular, for a measurement where a strong input light such as laser is used as a light source to detect weak signal light from sample, the signal light is difficult to detect due to stray light.

In order to reduce stray light in spectrometer, cut filter using dielectric film and double monochromator-type spectrometer with monochromators connected in series have been developed. However, those methods cannot remove stray light over wide wavelength range at once.

This invention is about a spectrometer equipped with a mechanism that can eliminate stray light in a wide wavelength range (from near-ultraviolet to near-infrared). The right figure shows the observed higher harmonics from the superconductor using this invention. Among the superconductor higher harmonics, the 3rd harmonic (around 2.1 eV = 590 nm) can be clearly observed with any spectrometer, but the 5th harmonic (around 3.4 eV = 360 nm) can be observed with good S/N ratio only with this invention. In particular, the noise of this invention is reduced by more than 3 orders of magnitude compared to the other spectrometers.

Features



Measurement result using normal spectrometer 1

Measurement result using normal spectrometer 2

Measurement result using spectrometer of this invention

Product Application

- Raman spectroscopy
- Spectrofluorescence measurement
- Higher harmonics observation
- Other spectroscopic measurement using laser irradiation of sample

IP Data

IP No. : PCT/JP2022/008650
Inventor : IWAI Shinichiro, KAWAKAMI Yohei
Admin No. : T21-068

Contact

Tohoku Techno Arch Co., Ltd.
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