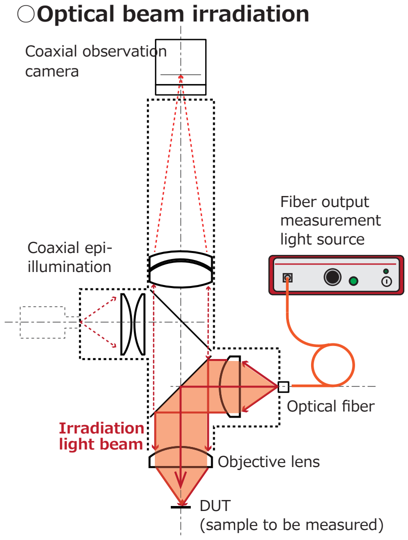
SUMMERY OF SYNOS' OPTICAL MEASUREMENT OPTICS

Synos' original and specially-designed multi-purpose optics for optical beam irradiation & detection, beam profile measurement.

Synos' optical measurement optics is highly functional optics, specially-designed for optical beam irradiation & detection measurement. In the field of optical applied measurement in recent years, with miniaturization, high integration and functionality of various optical semiconductor devices and elements, optical characteristic measurement by irradiating micro light beam to the microstructural sample, or detecting measurement light emitted from microstructural sample, is widely needed. Synos' optical measurement optics is equipped with optical fiber connection port and imaging detector connection port for image observation. With these functions, it becomes easy to introduce probe light from fiber light source to the sample, or to detect the measurement light from the sample, by monitoring sample image. It can be applied to a wide range of fields and applications, such as optical characteristic measurement of photo detector devices and light-emitting devices, irradiation of probe light to microscopic samples such as biocells, etc.

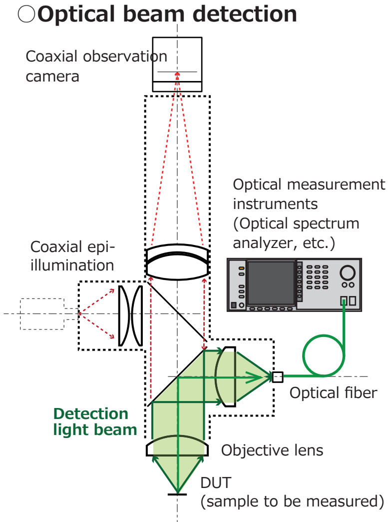
○Optical beam irradiation



○Light beam irradiation measurement

The left figure shows the simple internal structure of Synos' optical measurement optics. In beam irradiation measurement, the light from the fiber light source is applied to the sample surface to be measured. The light emitted from the optical fiber connected to the optical fiber connection port, travels along the optical path shown in red in the left figure, and is focused and irradiated to the sample that is placed at the focus position of objective lens. The core of the connected optical fiber is relayed to the sample at a ratio of 1: 1 (using 10× the objective lens). For example, if an optical fiber with a core diameter of 10um is used, the sample will be irradiated with a spot of 10umφ. The condition of the sample surface can be checked directly with the coaxial observation camera. In this way, it is possible to easily irradiate the sample with minute irradiation light equivalent to the diameter of the optical fiber core connected to the optical fiber port. The spot diameter of the irradiation light beam can be adjusted by changing the optical fiber core or objective lens magnification. In this way, by using optical measurement optics, it is possible to easily and reliably introduce minute measuring light to the sample. This method has been applied to the measurement of optical characteristics of light receiving elements such as photodiodes and optical sensors, introduction of light beams into optical waveguides and optical passive elements, and irradiation of light into biocells, etc.

○Optical beam detection



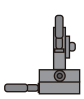
○Light detection measurement

In the case of received light measurement, contrary to light irradiation measurement, the measured light from the measured sample is coupled to the optical fiber connected to the optical fiber connection port.

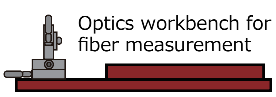
The light emitted from the sample travels along the optical path shown in green on the left and is coupled to the optical fiber connected to the optical fiber connection port. At this time, the measuring light from the sample corresponding to the core diameter of the connected optical fiber is relayed to the optical fiber core with 1: 1 (using 10× objective lens). For example, if optical fiber with a core diameter of 50 μm is used, the measured light from the portion corresponding to 50 umφ on the measured sample will be relayed to the optical fiber. Similar to the light irradiation measurement, the condition of the sample can be checked directly with the coaxial observation camera, including the light emitting position and light emitting condition, so easily checked the measurement position and light emission status by checking the image of the coaxial observation camera. As with light irradiation, the diameter of the light receiving measurement target can be adjusted by changing the diameter of the optical fiber core or the magnification of the objective lens. This method is applied to the measurement of light emission characteristics of semiconductor lasers and VCSELs, insertion loss and optical characteristic measurement of optical waveguides, optical fibers, etc.

【Component selection】

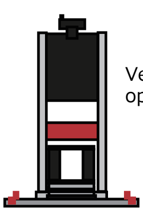
●Stage, optics bench



Sample stage
Optics stage



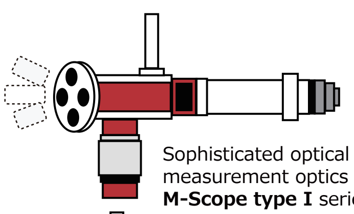
Optics workbench for fiber measurement



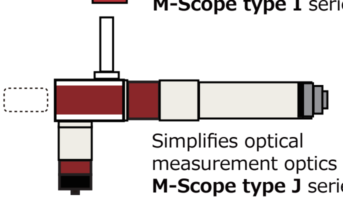
Vertical setting optics bench

＊Possible to combine various manual/motorized stages

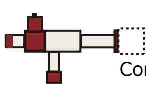
●Optical measurement optics



Sophisticated optical measurement optics **M-Scope type I** series



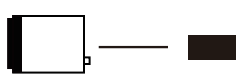
Simplifies optical measurement optics **M-Scope type J** series



Compact-type optical measurement optics **M-Scope type M** series

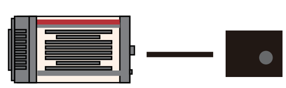
●Imaging detector

●for visible~1100nm



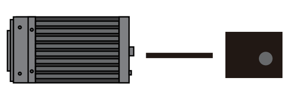
High resolution CMOS detector **ISA071**

●for 950~1700nm



InGaAs high sensitivity NIR detector **ISA041H2**

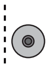
●for 400~1700nm



InGaAs high resolution NIR detector **ISA041HRA/HRVA**

●Image processing & analysis

Image processing & data analysis system

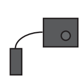


・Optical beam analysis software **Optometrics BA Standard**
・Special software : optical characteristic measurement, stage & system control, etc.

●Accessories

ND filter

Objective lens



Coaxial epi-illumination light source