86th RAP Seminar

The 86th Seminar on RIKEN Center for Advanced Photonics

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Location: **W319, 3F, Cooperation Center, Wako Campus, RIKEN**

（理研 和光キャンパス 研究交流棟 3階会議室 W319）

Title: **Development of high-power pico-sec./nano-sec. tunable light sources by fiber amplifiers**

光ファイバー増幅器によるピコ秒・ナノ秒波長可変レーザ光源の開発

Speaker: **Dr. Kiyofumi MURO**

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室　清文

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Pre-registration

In order to implement advanced spectroscopic technologies like a coherent Raman imaging in society, compact and easy to use tunable light source are strongly demanded.

Tunable diode lasers, which cover fairly large spectra region are versatile spectroscopic tool, however the power is always limited below 1W. To get high peak-power and short pulse we utilized fiber amplifier in combination with our tunable diode lasers.

Gain bands of fiber lasers, ascribed to Nd, Yb, Er atomic spectra are intrinsically much narrower than that of semiconductor, so we need to use gain tail of fiber amplifier.

Multiple cascade amplification scheme does not work very well, because gain reduction due to the induced emission near the gain center limits the gain band of fiber amplifier.

Therefore, we introduced narrow band tunable filters in between each fiber amplifier stage to maximize the gain at specific wavelength. In combination with SOA and EO modulators we realized compact pico-sec./ nano-sec. tunable light sources in 890~930nm and 975~1085nm band by utilizing Nd and Yb fibers, respectively. The peak power reaches 1kW that is sufficient for many multi-photon spectroscopies.

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