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# 1 Optical COE(Center of Excellence) Project

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The Communications Research Laboratory (CRL) has undertaken the Research of Advanced Optical Communications and Sensing Technologies (called the Optical COE Project at CRL) with the goal of establishing a fundamental technologies for next-generation optical communications and measurements. This effort is part of the national COE program funded by the Science and Technology Promotion Program of the Ministry of Education, Culture, Sports, Science and Technology (formerly the Science and Technology Agency). As we move into the 21st century, much higher speed communication and much more functional sensing than the conventional ones become more and more important for our society. To answer the expectations, we have engaged in leading-edge research, with a focus on active control of light waves and photons. FY2003 is the last year of the Optical COE Project under the framework of the national COE program.

Radio communications and measurement technologies play a crucial role in modern society, serving as a fundamentally important technological basis for information transmission, earth environment monitoring, and other applications. Because light has much shorter

wavelengths (higher frequency) than radio waves, it lends itself to use for high-speed communications and high-precision measurement, applications beyond the capabilities of radio waves. Its potential is expected to continue growing in the coming years, eventually leading to radically more sophisticated stages of technology. We have performed a wide range of research within the Optical COE Project to meet various needs in the fields of optical communication and sensing. Two milestones of the project years – the renaming in January 2001 of the CRL of the Ministry of Posts and Telecommunications to the CRL of the Ministry of Public Management, Home Affairs, Posts and Telecommunications and CRL's establishment in April 2001 as an incorporated administrative agency – have been accompanied by dramatic changes. With continuing efforts to advance optical communications and sensing technologies even in the midst of such organizational changes, we have produced research results worthy of significant attention within an enhanced research environment. This special issue summarizes the major research results of the Optical COE Project over the latter five years.



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