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Temperature Measurement Technique Using Phosphorescence of Porphyrin Dyes KENTARO KURA, SATOSHI SOMEYA, KOJI OKAMOTO, University of Tokyo — LIF have been developed to measure the temperature, pH and the oxygen concentration in the fluid. However, the frequent excitation of the fluorescent dye causes the quenching effect. In addition, two color LIF should be applied in order to cancel the effect of non-uniform light intensity of excitation. The phosphor emitting the phosphorescence for a few milliseconds by an excitation was measured at the high time resolution, while the phosphorescence lifetime is the function of the temperature. As the phosphorescence dyes, PtTFPP and PdTFPP were tested. Those mixed with Coumarin30 were also demonstrated. These dyes were excited by a CW laser with the wavelength of 405nm. As the result, it was clarified to be able to measure the temperature using these dyes and this laser. Present study is the result of "High speed three-dimensional direct measurement technology development for the evaluation of heat flux and flow of liquid metal" entrusted to the University of Tokyo by the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT).

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