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Global Oxygen Sensing and Visualization in Water using Luminescent Probe on Anodized Aluminum TATSUYA OZAKI, HITOSHI ISHIKAWA, Tokyo University of Science, YOSHIMI IIJIMA, HIROTAKA SAKAUE, JAXA — The extension of pressure-sensitive paint (PSP) technique as a wind tunnel technology to a global oxygen visualization and detection in water is presented. The topic includes the development of anodized-aluminum pressure-sensitive paint (AA-PSP) as a global oxygen sensor in water as well as its calibration and demonstration. Based on the luminophore study, platinum porphyrin is selected as a luminophore, because it is not dissolved in water. It is found that the luminescent increase is over 20 percent after 8 days immersed in water. Even though the signal increases after water immersion, its oxygen sensitivity is the same, which is 0.4. This AA-PSP is used to visualize oxygen rich water (20 mg/l) impinged in less oxygen water (3 mg/l). Even though the difference of water is only the amount of oxygen, we can visualize the water jet with its mixing process using a fast frame rate camera at the frame rate of 100 Hz. In the final version, we will include the oxygen map combined with the visualization result.

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