

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Assessing and Mitigating the Global Freshwater Crisis (6)

Author: Dr. Sivert Bakken
NTNU, Norway

Prof. Artur Zolich
Oslo Metropolitan University, Norway

Dr. Kai Sørensen
Norway

Ms. Sabine Marty
Norway

Dr. Therese Harvey
Denmark

Dr. Stephen Denis Grant
NTNU, Norway

Dr. Joseph Landon Garrett
NTNU, Norway

Ms. Janina Osanen

Norwegian University of Science and Technology, Norway

Dr. Vishnu Perumthuruthil Suseelan

Norwegian University of Science and Technology, Norway

Ms. Pipatthra Saesin
Norway

Prof. Tor Arne Johansen

Norwegian University of Science and Technology, Norway

INITIAL FIELD EVALUATION OF AN ON-WATER RADIOMETRY ROBOT FOR WATER
QUALITY AND SATELLITE VALIDATION

Abstract

This work presents a novel water quality assessment platform that utilizes on-water radiometry by the skylight-blocked approach (SBA). The SBA method directly measures water-leaving radiance (L_w) to calculate remote sensing reflectance (R_{rs}). The system is developed to aid collection of validation data for satellite remote sensing of water resources. The SBA approach avoids some post-processing procedures and is said to apply to more aquatic environments when compared to traditional methods. However, SBA-based measurements are subject to errors due to instrument self-shading, which traditionally is corrected using spectral optimization schemes. These self-shading effects can be further reduced by using a manoeuvrable platform, as shown here. The robot facilitates real-time assessments and more comprehensive spatial coverage while reducing personnel requirements compared to typical approaches used in the field today. Field tests in various lakes in eastern Norway are used to verify the robot's capability to produce accurate measurements. The measurements are evaluated using in-situ water-samples and quality metrics designed to assess water spectrum.