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Chapter 7

SIRREX-8 Results, Discussion, and Conclusions

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ABSTRACT

The SIRREX-8 experiment for comparing immersion factors involved nine OCI-200 sensors which were all characterized at three different facilities—CHORS, JRC, and Satlantic—using similar laboratory protocols. One of the radiometers, E_u S/N 130, was selected as a so-called *reference* sensor and was measured more frequently than the other eight. The analysis of the SIRREX-8 data showed intralaboratory measurement uncertainties, evaluated through multiple characterizations of the reference radiometer and defined by two standard deviations, ranging from 0.28% for Satlantic, and up to 0.49% and 0.60% for JRC and CHORS, respectively. Interlaboratory uncertainties, evaluated with data from the nine common radiometers, showed average UPDs lower than $\pm 0.6\%$. The analysis of $I_f(\lambda)$ variability across radiometers of the same series showed average values of approximately 2%, with maximum values of up to 5%, for all three laboratories. Typical $I_f(\lambda)$ values for the OCI-200 series of radiometers were produced with $I_f(\lambda)$ data from measurements taken from the three laboratories.

7.1 INTRODUCTION

The data collected at the three laboratories involved in the SIRREX-8 immersion coefficient intercomparison experiment were analyzed (after quality assurance) to investigate the following:

1. Intralaboratory uncertainties derived from the multiple measurements of the reference radiometer, and
2. Interlaboratory uncertainties derived from the common set of nine radiometers.

Additional objectives of the data analysis were: a) determining the average immersion factors; b) quantifying the variability across the OCI-200 series of radiometers (widely used in ocean color calibration and validation activities); and c) proposing a set of so-called *typical* spectral values for the considered series of radiometers.

7.2 THE DATA SET

The SIRREX-8 data set included the measurements made at CHORS, JRC, and Satlantic for nine OCI-200 radiometers. The methods used at each laboratory followed the protocol described in Mueller and Austin (1995) for the characterization of immersion factors, although there were differences between the published and practiced procedures. Table 12 presents the number of measurement sequences included in the data set. Filtering of measurement sequences affected by perturbations, like poor water quality or radiometer-to-source misalignment, was implemented in near-real time just after each measurement sequence by processing the data with the code described in Chapt. 5. One quality-assured measurement sequence per instrument per laboratory was considered acceptable for comparing data among the three different laboratories.