



Figure 2.7: A schematic diagram of the MOS functional elements.

National Oceanic and Atmospheric Administration/National Environmental Satellite Data Information Service (NOAA/NESDIS), MLML, San Diego State University, and the University of Miami (Florida). MOCE cruises, which are typically between 10 and 30 days in duration, have been conducted in the general vicinity of the MOBY site and off the west coast of North America (Table 2.1).

Measurements acquired during the MOCE cruises are generally more extensive than those made during the “L-cruises”. As an example, measurements made during MOCE-5 are listed in Table 2.5, which includes all of the “Required”, nearly all of the “Highly Desired” and some of the “Specialized Measurements” categories of variables listed in Table 3.1 (Vol. I, Chapter 3). Protocols for most of these measurements and analyses conform to those described elsewhere in this document. However, protocols are not provided elsewhere for two of the specialized measurements listed in Table 2.5, “Instrument Self-Shading” and “Particle Size Distribution”, nor are measurements of these variables identified in Vol. I, Chapter 3.

The effects of instrument self-shading on upwelling radiance and irradiance measurements are discussed briefly, and provisional protocols (based on Gordon and Ding 1992) for removing self-shading effects from measurements are described in Vol. III, Chapter 2 (Sect. 2.4). Direct measurements of the self-shading phenomenon are made during MOCE cruises (Table 2.5) to test the predictions of Gordon and Ding (1992) and determine relative uncertainties under a variety of ambient illumination conditions. A Fiber Optic Spectrometer (FOS) was developed using two modified American Holographic AH4000 series dual-beam spectrometers, one configured for radiometric measurements spanning the wavelength range from 375 nm to 725 nm at 5 nm resolution, and the other from 600 nm to 1100 nm at 10 nm resolution. The spectrometers are placed in a pressure housing and are coupled by fiber-optic leads to upwelling radiance and downwelling irradiance collectors that are located approximately 1 m away to minimize shading and reflection effects. The upwelling radiance probe is ~5 cm in diameter, and the self-shading effect is varied by attaching discs of increasing diameter to it.

Particle size distributions are measured using a commercial (Spectrex) laser particle counter. Particle counts, binned by size, are determined by measuring the magnitude of reflections from particles in a small working volume