of water illuminated by a Helium-Neon diode (670.8 nm) LASER. The working volume, which is embedded in a 100 ml water sample, and its geometry are defined by the optical elements of the instrument. The water sample is agitated with a magnetic stirrer to keep particles in suspension during the measurements. The protocols used for determining particle size distributions are those provided by the manufacturer of the Spectrex, which claim to resolve particle sizes as small as 1 μm. On the other hand, the assumptions underlying the method are that the individual particles are separated by distances large compared to the wavelength of illumination, and that particle diameters are at least 5 times larger than the wavelength, so that particle reflection is governed by geometric optics. Other investigators have used the Spectrex instrument to measure particle size distributions, but a community consensus has yet to be developed for protocols related to this measurement and its interpretation.

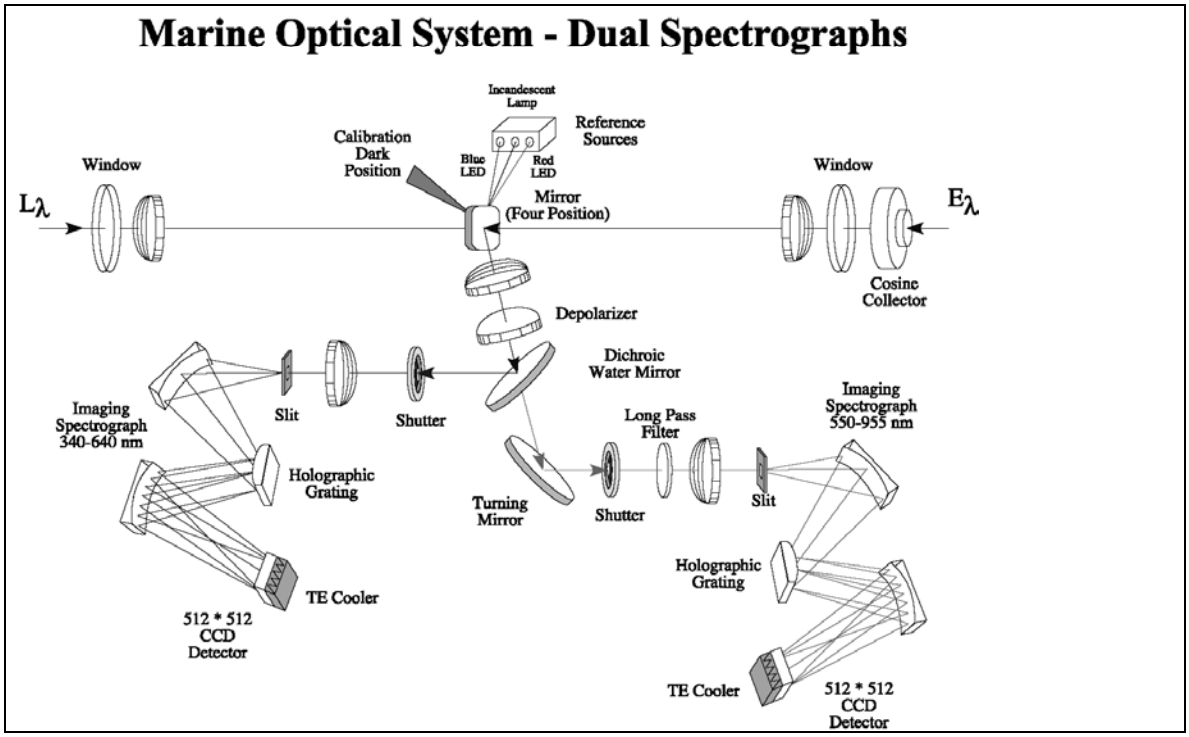

Figure 2.8: A schematic diagram showing the optical design of the MOS spectrographs.

MOBY System Operations Scheduling

MOBY data collection is programmed at the MOBY Operations Site in Honolulu, prior to each deployment. After the buoy has been deployed, any necessary program changes are made using a direct connection to the buoy's on-board computer. The on-board computer is programmed to acquire data during each event when the mooring site is in view of a satellite ocean color sensor. Currently, the MOBY radiometric measurement sequence, described below, is executed twice daily, coincident with the predicted overpasses of SeaWiFS and MODIS.

Radiometric Measurements

The MOS measures radiation input from one $L_u(z,\lambda)$, $E_d(z,\lambda)$ or $E_s(\lambda)$ head at a time. The desired channel is selected by the optical multiplexer. A rotating mirror within the MOS selects alternatively the input from the multiplexer, a dark reference calibration, light emitting diodes (LEDs), or a tungsten halogen incandescent lamp (Table 2.3). Integration times for the radiance collector on the top arm, at 1 m, typically range from 1 s to 4 s for the blue spectrograph and 10 s to 30 s for the red spectrograph. A typical sequence would be to measure $L_u(\lambda,z)$ from a depth, preceded and followed by $E_s(\lambda)$ surface reference spectra and associated dark spectra. Then this sequence is repeated at the 2nd and 3rd depths to complete the profile for $L_u(\lambda,z)$, as summarized in the example of