



Figure 2: Surface properties observed along the cruise track: (a) mole fractions of CO in the air, (b) dissolved CO concentrations and saturation anomaly in the sea surface mixed layer, (c) observed surface irradiance (red solid line) and modelled clear-sky irradiance (thin dotted line), (d) neutral wind speed at 10 m high, (e) daily sea-to-air CO flux, (f) sea surface temperature (SST) and sea surface salinity (SSS), and (g) chlorophyll-a (*Chl-a*) concentrations in the surface waters. Time is given in Coordinated Universal Time (UTC). In (a), black circles represent analyses by LGR systems, the blue circles represent RGA-3 analyses, and the two red circles filled with yellow represent the observations at the NOAA/ESRL global network stations, SHM (Shemya Island, Alaska) and CBA (Cold Bay, Alaska). In (b), red circles filled with yellow represent discrete measurements interpolated at a depth of 7 m at each hydrographic station. In (g), black dots represent the continuous measurement by Turner 10-AU fluorometer and red circles filled with yellow indicates the discrete measurements of *Chl-a*. Individual gray-shaded areas represent one day at the given station. The geographical provinces of ES, NP, and BS are separated by vertical red lines.