SEA LEVEL VARIATION PATTERNS IN THE PACIFIC OCEAN

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ABSTRACT

Sea level records along the rim of the Pacific Ocean show very high regional correlation. Using factor analysis, we have grouped the closely related stations together, and we find that the correlation patterns are caused by various combinations of physical processes. Steric effects are important at low and temperate latitudes. Seasonal solar radiation causes the temperature and sea level of the surface waters to fluctuate with an annual frequency. The locations of groups representing nonseasonal sea level variations coincide with those of the water masses at the thermocline depth as defined by Sverdrup. Nonseasonal sea level variations are related to anomalies in current transport, temperature, and vertical fluctuations of the thermocline. Atmospheric pressure variations affect the high latitude groups; the annual sea level maxima at the high latitudes are shifted from autumn to winter by the pressure minimum in winter.