Using numerical output from the high resolution Regional Ocean Model and a full series of
Topex/Poseidon observations, we compare basic statistical characteristics of SSH variability in the
equatorial Pacific region between 20°N and 20°S as predicted by the model and observed by the altimeter.
The focus is on the zonal and meridional distributions of low-frequency variability for timescales from
semi-annual to interannual. The ocean variability is analyzed separately for four frequency bands with
scales 0.5 year, 1 year, 1.5 year and 2.3-4.5 years. Meridional profiles of SSH variance on these
timescales are analyzed and individual dynamical components of the variability quantified using the
wavenumber-frequency spectra of SSH spatial-temporal variations. The four frequency bands are shown
to account for about 63 percent of the total SSH variance. We find in particular that wave-related
variations on annual timescales account for about 33% of the total, whereas the semiannual wave-type
oscillations contribute only about 4 percent. In agreement with the previous findings, the variability is
dominated by steric-type oscillations whose spatial scales are comparable with the zonal extent of the
area. However, we also find that intermittently occurring very large-scale equatorial eddies yield an
appreciable fraction of the total energy. The meridional structure of oscillations is of particular interest, and
we have managed to obtain an unprecedented detailed distribution of the energy across and along the
equator for each type and timescale of oceanic motions. Both agreements and discrepancies between
the model output and the observed variability are highly instructive and pose important questions
regarding the ability of the numerical model to reproduce the actual physical phenomena.