Geophysical Research Abstracts
Vol. 12, EGU2010-2999, 2010
EGU General Assembly 2010

Nonlinear Interaction of Internal Waves in the Coastal Zone

Vadim Novotryasov
Il'ichev Pacific Oceanological Institute, Vladivostok, Russia (vadimnov@poi.dvo.ru)

Nonlinear interactions of the internal waves of a tidal period with low-frequency synoptic-scale oscillation are studied using instrumental measurements of the current in the coastal zone of the Sea of Japan. In the course of spectral analysis of the data of instrumental measurements, it is found that a maximum in the spectrum of the kinetic energy of coastal waters in the vicinity of the semidiurnal frequency M2 is surrounded by satellite maxima whose frequencies obey the relation freq1 = M2 + Sso and freq2 = M2 - Sso, where Sso is the characteristic frequency of synoptic-scale oscillation. The spectrum of the anticyclonic current component has a similar structure in the vicinities of the frequency M2 and its first and second harmonics. The general theory of nonlinear interactions of weakly dispersive waves is used to solve the problem of modulation and the parametric amplification of tidal internal waves in the coastal zone using low-frequency narrow-band internal random waves. As can be judged from the literature, the effect of parametric modulation of tidal internal waves by low-frequency synoptic-scale internal waves has been recorded in the coastal zone of a tidal sea for the first time.