海面水温変動へのウェーヴレット解析の適用

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Abstract

Wavelet spectrum analysis was applied to sea surface temperature images derived from NOAA/AVHRR for the area around Japan. A two-dimensional wavelet spectrum for each scale (wave number) was computed at each position using the Haar wavelet basis, and then a specially-averaged wavelet spectrum was calculated for each scale. The wavelet spectral slope derived from the averaged wavelet spectra was approximately -2.0 in the wavelength range between 4 and 280 km in the Kuroshio area and the East China Sea, while in the Japan Sea and the Perturbed area (between the Kuroshio and the Oyashio), the slope was approximately -5/3. However, the calculation of the slope at every position showed the values of the slope were randomly distributed, and even in the Japan Sea and the Perturbed area, the number of positions where the slope was -5/3 was very small (about 10%). The results gave insight into the structure of horizontal turbulence, which would be impossible using a traditional Fourier transform approach.