Abstract Details

AOGS 1st Annual Meeting > Ocean and Atmospheres > Winter Sea surface temperature variability in the middle of Taiwan Strait as derived from satellite and shipboard data >

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Title: Winter Sea surface temperature variability in the middle of Taiwan Strait as derived from satellite and shipboard data

Abstract: Satellite-sensed advanced very high resolution radiometer (AVHRR) sea surface temperature (SST) data over eight winters (1996-2003) and shipboard measurement during winter 2002 were used to analyze the winter SST patterns of variability in the middle of Taiwan Strait. Empirical orthogonal function (EOF) analysis of the spatial and temporal variance for 81 nearly cloud-free quarter monthly images was performed. The EOF analysis shows that the variance of oceanic feature was significant in space than in time. The first mode (85.7%) of the spatial variance shows a persistent front near the Chang-Yuen Ridge in the middle of Taiwan Strait, which separates warmer surface water (>22C) to the southeast from the colder waters (<19C) off Mainland China to the northwest. The second spatial variance mode is extremely low energy (3.1%) and does not reveal statistically significant information in the AVHRR data. show the. The patterns of water surface temperature and salinity in field are consistent with satellite measurements. Series of images during the period of field measurement indicated that the thermal front was shifted and changed with time. From these images, we also discussed the temporal variances of the winter thermal fronts in relation to the interaction of the South China Sea Warm current and Kuroshio counter current.

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