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Empirical Orthogonal Analysis of Pacific Sea Surface Temperatures

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ABSTRACT

An empirical orthogonal function analysis has been performed on monthly mean sea surface temperatures for the greater part of the Pacific Ocean between 55° N and 20°S. The analysis identifies the most important modes of seasonal and non-seasonal variability during the period 1949–73. A mode is defined spatially in terms of an empirical orthogonal function which describes the degree of coherence of variation. The function's corresponding coefficient portray the evolution of the mode in time. The seasonal variation is dominated by a mode having a 12-month periodicity and greatest coherence in the higher latitudes. A second important seasonal mode has a period of approximately 6 months and is dominated by deviations in the North Pacific. The most important non-seasonal variation is identified with the, long-recognized El Niño. The spatial pattern of this mode demonstrates the large-scale nature of the El Niño phenomenon. Other important non-seasonal modes are discussed.

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