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Oceanic Responses Exhibited by a General Circulation Model
in Response to Surface Wind Forcing from Satellite Data during El Niño

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Surface wind forcing derived from the spaceborne microwave radiometer and scatterometer from July 1987 to June 1993, covering both the warm and cold phases of El Niño episodes, were used to force a primitive-equation ocean general circulation model. The oceanic responses in the tropical Pacific were compared with measurements from moorings and observations from spaceborne radiometers and altimeters. Diagnostics, such as, heat balance, steric level, and sea surface temperatures were compared. The spaceborne sensors were found to provide more realistic episodic westerly wind events during the warm phases and easterly wind events during the cool phases of ENSO, than the wind products from operational numerical weather prediction centers. The model, with only realistic wind forcing, was able to reproduce major parts of the warming and cooling associated with the ENSO episodes during this six year period, in the central and eastern tropical Pacific, but not in the western Warm Pool.