



Intraseasonal Oscillatory Modes in the Eastern Mediterranean Sea

The intraseasonal oscillations (ISOs) in sea currents in the eastern Mediterranean Sea near the central coast of Israel were analyzed by examining the velocity components of the sea currents at different depths as measured by acoustic Doppler current profilers located at various depths between 0 and 675 m. The total period covered by the observations was from December 2016 to May 2018. Prominent intraseasonal oscillations, much stronger than tidal velocity components, were observed in the upper part of the sea, at 30–70 m. The amplitudes of these oscillations are between 4 and 10 cm/s and their periods are 7, 11, 22, and 34–36 days. The strongest oscillations are found in the boreal winter. The ISOs in the sea currents were apparently induced by corresponding oscillations found in atmospheric wind velocity over the eastern Mediterranean at the surface and at 500 and 250 hPa, as suggested by the high correlations, 0.6–0.9, between the wind velocity components of the oscillatory modes in the atmosphere and the velocity component of the oscillatory modes in the sea currents with similar periods. We propose that the source of the ISOs in the atmosphere over the eastern Mediterranean is the South Asian jet wave train. The track of this wave train passes over the eastern Mediterranean, and the periods of the ISOs in the wave train are in the same band as the oscillations found here. The wave train is equivalently barotropic and strongest in the upper troposphere. This property of the wave train can explain the high correlation found between the oscillatory modes of wind velocity at 250 or 500 hPa and those in the sea currents. In all the cases besides the 7-day oscillatory mode, the significant oscillatory modes found at 250 or 500 hPa are also significant in the velocity components of the surface wind.

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