Numerical Simulation of Ekman Theory in Five Layers Oceanic Basin

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Abstract

Wind is a major factor which induces oceanic currents and many theories including the Ekman theory have considered the wind induces currents. In this paper a numerical process has been used for forecasting of oceanic currents based on this theory. The survey has been done in an artificial five layer oceanic basin with smooth bottom of 120 meters, considering the geographic position of Persian Gulf. Primitive equations were solved on earth's spherical coordinates system with sigma as vertical coordinate by finite element method. Vertical profile of predicted current vectors showed the complete formation of Ekman Spiral in the basin. This experimental simulation is a new approach for confirmation of Ekman Theory.

Keywords: Numerical Simulation, Ekman Theory, Five Layers Oceanic Basin.

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