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论文

从二维地转风到三维涡旋运动

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摘要: 给出了大气三维涡旋运动基本态所满足的简洁的偏微分方程. 大气涡旋运动存在低压辐合上升和高压辐散下沉的基本状况, 基本态的三维速度场可以用流函数和对流速度势分解, 且具有螺旋结构. 当Reynolds数 $Re \rightarrow \infty$ 时, 涡旋运动就化为地转风, 涡旋运动近似就化为地转风近似.

关键词: 大气涡旋运动 地转风 基本态

FROM 2 D GEOSTROPHIC WIND TO 3 D VORTEX MOTIONS

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Abstract: Simple partial differential equations satisfied by the basic states of 3 D vortex motions were derived. There exist the basic patterns that low pressure convergence leads to uplifted motion and high pressure divergence leads to down flow in the atmospheric vortex motions. These basic states of 3 D velocity field can be described in terms of stream function and convective velocity potential decompositions, and there

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are spiral structures in these motions.
Actually, when $Re \rightarrow \infty$, vortex motion
degenerates into geostrophic wind, and
corresponding vortex motion approximation is
replaced by geostrophic approximation.

Keywords: Atmospheric Vortex motion
Geostrophic wind Basic states.