The Global Circulation of the Atmosphere: A Comprehensive Examination

The global circulation of the atmosphere is a complex system of air currents that circulates around the Earth. It is driven by a combination of factors, including the Earth's rotation, the uneven heating of the Earth's surface by the sun, and the Coriolis effect. The global circulation of the atmosphere is responsible for distributing heat and moisture around the globe. It also plays a major role in determining the weather patterns in different regions of the world.

The Hadley Cells

The Hadley cells are the largest circulation cells in the atmosphere. They extend from the equator to about 30 degrees latitude in both hemispheres. The Hadley cells are driven by the rising of warm air at the equator and the sinking of cool air at the subtropics. The rising air at the equator forms a band of low pressure, known as the Intertropical Convergence Zone (ITCZ). The sinking air at the subtropics forms a band of high pressure, known as the subtropical high-pressure belt.

The Global Circulation of the Atmosphere by Stephen J. Blank

★★★★★ 5 out of 5

Language	: English
File size	: 26771 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Print length	: 669 pages
Screen Reader	: Supported
Paperback	: 60 pages
Item Weight	: 3.39 ounces
Dimensions	: 4.72 x 0.24 x 7.09 inches

The Hadley cells are responsible for the trade winds, which are the prevailing winds in the tropics. The trade winds blow from the subtropical high-pressure belts towards the ITCZ. They carry warm, moist air from the tropics to the equator.

The Ferrel Cells

The Ferrel cells are the circulation cells that are located between the Hadley cells and the polar cells. They extend from about 30 degrees latitude to 60 degrees latitude in both hemispheres. The Ferrel cells are driven by the rising of warm air at the subtropics and the sinking of cool air at the mid-latitudes. The rising air at the subtropics forms a band of low pressure, known as the subtropical low-pressure belt. The sinking air at the mid-latitudes forms a band of high pressure, known as the mid-latitude high-pressure belt.

The Ferrel cells are responsible for the prevailing winds in the mid-latitudes. These winds are known as the westerlies. The westerlies blow from the mid-latitude high-pressure belts towards the subtropical low-pressure belts. They carry cool, dry air from the mid-latitudes to the subtropics.

The Polar Cells

The polar cells are the circulation cells that are located between the Ferrel cells and the poles. They extend from about 60 degrees latitude to the poles in both hemispheres. The polar cells are driven by the rising of warm air at the mid-latitudes and the sinking of cool air at the poles. The rising air

at the mid-latitudes forms a band of low pressure, known as the subpolar low-pressure belt. The sinking air at the poles forms a band of high pressure, known as the polar high-pressure belt.

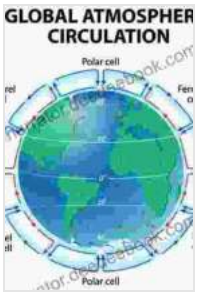
The polar cells are responsible for the prevailing winds in the high latitudes. These winds are known as the easterlies. The easterlies blow from the polar high-pressure belts towards the subpolar low-pressure belts. They carry cold, dry air from the poles to the mid-latitudes.

The Impact of the Global Circulation of the Atmosphere

The global circulation of the atmosphere has a significant impact on the climate of the Earth. It determines the distribution of temperature and precipitation around the globe. The Hadley cells, Ferrel cells, and Polar cells are responsible for the major wind patterns and weather patterns that we experience on Earth.

The global circulation of the atmosphere is also affected by human activities. The burning of fossil fuels releases greenhouse gases into the atmosphere. Greenhouse gases trap heat, which causes the Earth's temperature to rise. This can disrupt the global circulation of the atmosphere and lead to changes in weather patterns.

The global circulation of the atmosphere is a complex and fascinating system. It plays a major role in determining the climate of the Earth and the weather patterns that we experience. Understanding the global circulation of the atmosphere is essential for predicting and understanding climate change.



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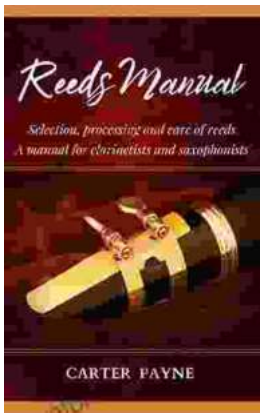

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