Mikhail Vasilievich Lomonosov (1711-1765)

Observation of Venus transit in 1761.

First claim of the Venusian Atmosphere.
Discovery of Venus Rotation and Advent of Space Exploration of Venus

- 1962  Soviet Radar by Doppler (V.A.Kotelnikov)
  Period between 200 and 300 days.
  Retrorotation with T=243 days.

- VENERA Missions (1-16; 1961-1985)
  T = 470 C;  P = 90 bar
  CO2 = 95%
Lander (Venera-9 and beyond)
T. Gold et al. (1969) Model of Superrotation
Thermal Tides in the Atmosphere of Venus: Comparison of Model Results with Observations

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ABSTRACT

A linearized primitive equation (LPE) model is developed to study thermal tides in the atmosphere of Venus. The LPE model describes diurnal and semidiurnal oscillations of a cyclostrophically balanced atmosphere in which zonal velocity varies with altitude and latitude. The numerical algorithm follows Staniforth and Daley. The solar thermal forcing is increased algebraically in time to separate the forced tidal response from free atmospheric oscillations. Parameters of the basic state and forcing agree with Pioneer
Venera-EOS aborted Mission (1983)
The Vega balloon probe comprised a 3.4 meter diameter balloon and a gondola, suspended below the balloon by a 13 meter long tether strap. The total mass of the deployed balloon probe was 21.5 kg: 12.5 kg for the balloon and tether, 6.9 kg for the gondola, and 2.1 kg of helium in the balloon. The balloon, gondola, parachute, ballast, tanks of helium, and timing electronics and pyrotechnic release devices with a total mass of 120 kg were stored in a toroidal compartment surrounding the lander antenna before deployment.
Abstract
The VEGA balloons provided a long-term record of vertical wind fluctuations in a planetary atmosphere other than Earth's. The vertical winds were calculated from the observed displacement of the balloon relative to its equilibrium float altitude. The winds were intermittent; a large burst lasted several hours, and the peak velocity was 3 meters per second.
A Nonhydrostatic Model of the Global Circulation of the Atmosphere of Venus

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Abstract—The mechanisms of the global circulation in the atmosphere of Venus have been studied with the use of numerical models. To calculate the heating/cooling of the atmosphere due to absorption/emission of electromagnetic radiation under initially weak and strong superrotation of the atmosphere, the complete system of gas dynamics equations in the relaxation approximation was considered. It has been shown that at sufficiently high rates of heating of the atmosphere by radiation on the day side and at sufficiently high rates of cooling on the night side, a thermal tide develops at altitudes of 40–70 km, and its energy and impulse is transferred to the zonal superrotation of the atmosphere. Due to the interaction between the superrotation and the meridional transfer of the air mass through the polar region from the day side of the planet to the night side, near-polar vortices are formed at altitudes of 40–70 km near the morning terminator.