

## Balloon-Borne Telescope System for Optical Remote Sensing of Planetary Atmospheres and Plasmas

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This paper reports on the ongoing development of a balloon-borne telescope system for remote sensing of planetary atmospheres and plasmas. In this system, a Schmidt Cassegrain telescope with a 300-mm clear aperture is mounted on a gondola whose attitude is controlled by control moment gyros, an active decoupling motor, and a Sun sensor. The gondola can float in the stratosphere for periods in excess of 1 week. A pointing stability of 10 arcsec/sec will be achieved via the cooperative operation of the following three-stage pointing devices: a gondola-attitude control system, two-axis telescope gimbals for coarse guiding, and a tip/tilt mirror mount for guiding error correction. The first target for the system is Venus. Wind vectors in the Venusian upper atmosphere will be derived from the tracking of cloud patterns observed in the ultraviolet and near-infrared regions. The system is under final testing as of February 2007, and the first experimental flight is scheduled for June 2007 at Sanriku Balloon Center of ISAS/JAXA. After confirming the performance of the system in a test experiment, it will be refurbished and placed into full-scale operation in the polar regions. In terms of location and facilities, Kiruna is the most ideal launching site in the Arctic. A long-duration flight in the Arctic is scheduled for 2009. The purpose, target phenomena in the planetary atmospheres and plasmas, instrumental design and performance, results of various ground tests, and prelaunch status of the experiment will be presented.