Venus observations from 2-M HCT, IAO-Hanle (Ladakh)

B. C. Bhatt and T. P. Prabhu Indian Institute of Astrophysics, Bangalore

Indian Institute of Astrophysics (IIA), Bangalore has initiated a survey of potential high altitude astronomical sites in India during 1993-1997, and Hanle in Ladakh region of Jammu & Kashmir was discovered as an excellent high altitude site for ground based astronomy. Hanle provides more than 250 usable nights uniformly spread over the year, with low humidity, good transparency and seeing. With these unique features, Indian Astronomical Observatory (IAO) was set up with a 2-m optical-infrared telescope named Himalayan Chandra Telescope (HCT) at Mt Saraswati, Hanle, at an altitude of 15,000 ft above sea level. This telescope is remotely operated via satellite communication link from the CREST, Hosakote, an extended campus of Indian Institute of Astrophysics at Bangalore. The HCT is equipped with instruments for imaging in the optical and near-infrared region, and for intermediate resolution spectroscopy. The second generation instruments under development are a near-infrared imager-spectrograph and optical high resolution spectrometer.

The HCT is operational through regular allotment cycles since 2003 and has been used for a wide range of studies in solar system, galactic and extra-galactic astronomy. As we know that location of Hanle fills a huge gap between observatories in east and west of the globe and observations from Hanle are highly significant in any coordinated world-wide monitoring campaign. One successful ground based multi-observatory campaign involved monitoring of Venus' dark atmosphere in near infrared. The science goal of this project is to learn more about the dynamics of lower atmosphere of Venus through observations of lower and middle decks of atmosphere. Venus' lower and middle cloud decks are typically observed as silhouettes against thermal emissions from Venus surface and lower scale heights. The best time for an observing campaign is near inferior conjunction, when Venus's disk subtends a large angle (60 arcsec) and the sunlit crescent is minimal. The proximity to the Sun and its intrinsic brightness makes Venus a challenging object to observe from ground based telescopes and can be accessible only for ~2 hrs before sunrise / after sunset. By observing Venus in Multiobservatory Campaign one can extend the coverage of its atmosphere which is essential for monitoring the displacement of the cloud features. During last 5 years, we have participated in a few campaigns of Venus observations using the 2-m HCT and obtained useful results.