

NAVA - an experiment designed to detect the hitherto undetected Oxygen airglow emission in Venus from an orbiter

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The oxygen airglow emissions at wavelengths 557.7 nm (green line) and 630.0 nm (red line) are regularly monitored at the Earth but these emissions were not detected in the CO₂ rich atmosphere of Venus by the earlier and present missions that include Venera 9/10 and Akatsuki. However, based on high resolution 10 meter Keck telescope observations, Slanger et al. (2001) detected Venusian green airglow (557.7 nm) emission at the night limb. Slanger et al. (2001) could not detect red airglow (630.0 nm) emission from Venus. It was also shown that the green line intensity responds to solar activity and the intensity is more during solar maximum. The earlier orbiter missions and the Keck observations suggest that in order to detect oxygen airglow emission from a Venusian orbiter, it is necessary to have an airglow photometer with small spectral bandwidth (to enhance SNR), narrow field of view (to capture small variations in signal) and observations during high solar activity period. Keeping these in mind, an airglow photometer payload NAVA (Narrow band oxygen Airglow detection in Venusian Atmosphere) has been designed that can be flown in the future Indian Venus mission. This talk will address the scientific motivation, salient features of the instrument and initial progress made in terms of the development of the instrument.