



Short wavelength albedo, contrasts and micro-organisms on Venus

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The decrease in the amount of sunlight reflected by Venus at wavelengths below 500 nm, and the presence of contrast features prominent at ultraviolet wavelengths (270 – 410 nm) are two properties of the Venus clouds that despite numerous attempts, remain unexplained. Additional uncertainties include why the contrasts exist at all, and why the substance responsible for the contrasts does not appear well mixed. Nearly a century after the ultraviolet contrasts were discovered using Earth-based photographs, the substance or mechanisms responsible for the lower albedo and contrast patterns are still unknown. Many physical and chemical explanations have been proposed, but none of the hypotheses explain decrease of albedo below 500 nm, the spectral dependence of contrasts, and plausible mechanisms for presence or transport of those substances – transport from surface if the absorber is a condensation nuclei or transformations if in dissolved form due to photochemistry and the observed rapid changes in the contrasts. Considering the ultraviolet absorption shown by some terrestrial microorganisms, we speculate whether airborne bacteria (indigenous or introduced through meteoritic impact debris transported from Earth) could explain the mysterious contrast or the absorption cloud features on Venus. Plumes of cloud-borne aeroplankton, analogous to phytoplankton in Earth's oceans which are in dense enough concentrations to be observed from space, may have evolved on Venus when the planet had liquid water on its early surface, eventually migrating to a habitable zone in the clouds 50-70 km above the inhospitably hot surface today.