What have we learned about Venus clouds and haze with Venus Express?

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Clouds and haze of Venus are the major targets of the Venus Express mission. The planet is covered by layers of thick clouds and haze which are thought to control planet's heat balance, climate, and atmospheric dynamics. Previously, our knowledge was limited to "remotely sensible" upper cloud/haze layer or to a few locations where descent probes made direct measurements in the atmosphere. One of objectives of Venus Express is, of course, to update our "old" knowledge on the clouds and haze. In addition to that, Venus express, as well as future Venus exploration missions (Japan's Venus Climate Orbiter, etc.), is to answer outstanding questions such as: (a) What is the valiability of clouds and haze (spatially and temporarily) and what are the causes for changes?; and (b) Do large crystals (mode-3 particles) exist near the cloud base?

VIRTIS utilizes near-infrared windows (1-2.4 microns range) to sense the clouds and gases in the middle to lower atmosphere, revealing great variability of cloud opacity. SPICAV/SOIR is sensitive to upper haze and near cloud topas it utilizes a lay of light (from a star or the Sun) which grazes the atmosphere, also finding semi-periodic change in aerosol opacity with a large amplitude. The aim of this paper is to summarize Venus Express findings on clouds and haze and to draw a updated view.