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Morphology and dynamics of the Venus upper cloud layer

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The motion of Venus clouds holds important clues for the understanding of the super-rotation of its atmosphere. The Venus Monitoring Camera (VMC) on Venus Express (VEX) spacecraft has been monitoring the upper cloud layer through its ultra-violet (UV) channel centred at 365 nm. This wavelength corresponds to the spectral feature of a, so far unidentified, absorber. The VMC UV data show a variety of cloud morphologies produced by this absorber. Taking advantage of the VMC high resolution imaging (down to 200 m px^{-1}) and the VEX polar orbit we investigate both global and small scale properties of these clouds and their temporal and latitudinal variations. The global scale features include equatorial belts, bright polar bands, and polar caps. The observed small-scale features change in their appearance from mottled clouds and convective cells at low latitudes to streaky patterns at middle and high latitudes, indicating the peculiarities of the atmospheric dynamics across the Venus disc. We find that most of the atmospheric features observed in the past have substructures, now for the first time resolved by VMC. In particular the convective cells seen in vicinity of the sub-solar point appear to have an aspect ratio smaller than the estimates from the previous data sets. This could imply that convection in the upper cloud deck is indeed shallow and have implications for the vertical transport of mass, momentum and energy.