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Short-term modulations of Venus' disk-integrated brightness observed from the Venus orbiter Akatsuki

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We show that Venus' disk-integrated brightness at 283, 365, and 2020 nm is modulated by one or both of two periods of 3.7 and 4.6 days, as observed from the Akatsuki Venus orbiter of JAXA. Their typical amplitudes are <10%, but there are occasional events of 20–40%. We find a clear anti-correlation between UV and 2020-nm signals, implying that the cloud top altitudes (2020 nm) and the abundances of UV absorbers (283 and 365 nm) change simultaneously in the global scale. We note that the detected modulations, and their wavelength dependent signals imply the existence of an atmosphere if detected at an exoplanet. Our results should be useful in future direct imaging of terrestrial exoplanets. More details are shown in our paper (https://doi.org/10.1038/s41467-020-19385-6).