

Feasibility of ground-based optical observation an ion pick-up from Venus atmosphere

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The ion pick-up process plays an important role on the atmospheric escape of Mars and Venus because their new ionospheres are directly exposed to the solar wind due to no intrinsic magnetic field. Although in-situ measurement data obtained by orbiters such as Mars Express and Venus Express are useful to investigate the ion pick-up, it is rather difficult to observe the global change of ion pick-up caused by solar wind disturbance. On the other hand, a ground-based optical observation will enable us to study the global variation of ion pick-up. However, observations of weak ion emission close to an extremely bright planetary disk are expected to be difficult. In order to realize such difficult observation, we have a plan to construct a new telescope dedicated to planetary observation. We, with Institute for Astronomy of University of Hawaii and ETH Zurich, plan to construct a 2-m off-axis Gregorian telescope, with which coronagraphic use is possible, at the summit of Mt. Haleakala in Maui, Hawaii. In this study, we have examined a feasibility of imaging observation of Venusian ion pick-up using the new optical system. It is estimated that the resonant fluorescence of pick-up CO^+ ions can be detectable with this new telescope while such observation is almost impossible with an existing conventional telescope.