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Plans of lightning and airglow observation by LAC/Akatsuki

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Recently it is reported that the magnetometer on board Venus Express detected whistler mode waves whose source could be lightning discharge occurring well below the spacecraft. However, it is too early to determine the origin of such waves. On the other hand, night airglow is expected to provide an essential information on the atmospheric circulation in the upper atmosphere of Venus. But the number of consecutive images of airglow is limited and even the detail variations of most enhanced location is still unknown.

In order to identify the discharge phenomena in the atmosphere of Venus without ambiguity and to know the daily variation of airglow distribution in night-side disk, we plan to observe the lightning and airglow optical emissions with high-speed and high-sensitivity optical detector on board Akatsuki. We are ready to launch the flight model of lightning and airglow detector, LAC: Lightning and Airglow Camera. Main difference from other equipments which have provided evidences of lightning existence in Venus is the high-speed sampling rate at 32 us interval for each pixel, enabling us to distinguish the optical lightning flash from other pulsing noises. In this presentation the observation strategies, including ground-based support with optical telescopes, are shown and discussed.

Keywords: Venus, lightning, airglow, LAC, Akatsuki