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Hydroxyl nightglow on Venus observed by VIRTIS on Venus-Express

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Hydroxyl has been recently observed for the first time in the Venusian atmosphere with the VIRTIS spectrometer on board the Venus-Express spacecraft. The transitions (1-0) around 2.81 microns and (2-0) around 1.46 microns have been detected. The intensity of the two emissions are respectively about 55 and 480 times less intense than the (0-0) oxygen transition (Piccioni et al, A&A, 2008). The possible chemical reactions which can produce hydroxyl on Venus involve O_3 and HO_2, with the former being the most probable, and hence OH can be used to indirectly infer the ozone distribution on Venus. VIRTIS data in limb mode observation were analyzed to derive the mean distribution of hydroxyl in the night side of Venus and the results are presented here. The typical peak altitude of the two emissions is set at 95-96 km in limb view, a few km lower than the oxygen emission at 1.27 um due to the transition (0-0). The peak altitude of the latter typically occurs at 97-98 km height. The OH full width at half maximum is in average about 7 km, and sometimes higher. The mean map of (1-0) hydroxyl distribution around 2.81 microns shows a maximum of emission of about 130 kR near the anti-solar point at about 1h local time. The study of the (2-0) hydroxyl distribution at around 1.46 microns results more difficult due to its weak intensity.