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Oxygen nightglow emissions in the Venus atmosphere, observed by the visible channel of VIRTIS/Venus Express

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The oxygen nightglow emissions in the visible spectral range have been known since the early observations with the Venera spacecraft. The VIRTIS instrument on board Venus-Express allows extension of observations of the Herzberg II system of O_2, and we report a mean value of 200 kR for the integrated intensity of the progression in limb view. Moreover, three bands of the Chamberlain system have been detected in the VIRTIS mean spectrum, with a mean intensity of 8-10 kR for the most intense of these bands. For the 0-v$''$ progression of the Herzberg II system, with v$''$ = 6-13, the maximum emission is typically observed at 95-96 km, with a full width at half maximum ranging from 12 to 15 km. A systematic observing campaign at limb is in progress from Venus Express, which will allow mapping the horizontal spatial distribution of these emissions. Once the map is enough populated, it will be possible to compare the results obtained both in the visible and IR for the O_2 nightglow emissions, although not simultaneously.