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ALTIUS: a micro-satellite spectral imager for atmospheric remote sensing

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There has been a dramatic decrease in the number of available instruments which are capable of vertical remote sounding of the atmosphere. These instruments are critical for the long-term monitoring of global changes. Benefiting from new and promising remote sensing technology, ALTIUS is a Belgian micro-satellite mission which has recently been implemented as an element of Earth Watch through the European Space Agency (ESA). The mission concept was first developed in 2005 at the Royal Belgian Institute for Space Aeronomy (BIRA-IASB) and proposed to ESA through federal Belgian support. As a result, it was a small mission that has grown from the bottom up. It has two purposes: 1) an operational activity, for near real-time monitoring of stratospheric ozone (O_3); and 2) scientific objectives, for long-term measurements of O_3, NO_2, H_2O, CH4, aerosols, PSC & PMC, temperature, tomography, and airglow. This innovative instrument employs a spectral imager with both limb and occultation capabilities with 3 channels covering a spectral range of 250-1800 nm, operating in several observation geometries from a micro-satellite platform (PROBA) with a target vertical resolution of 0.5-1.0 km in the range 10-100 km. It will achieve global coverage through a standard heliosynchronous orbit.