



The extension of the ENVISAT Atmospheric-Chemistry missions beyond 2010: status and perspectives

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The importance of an extended and coherent dataset of atmospheric trace gases is well recognized within the science community. In fact, while new satellite missions allow improving the spatial and temporal resolution of the atmospheric products, the maintenance and preservation of existing missions is essential in order to produce long term series of geophysical parameters for climate studies and air quality modeling. The extension of the ENVISAT mission beyond its nominal lifetime of five years (from 2002 until 2007) is an example on how ESA, industry and the science community successfully cooperate for the generation of such long term series. Since 22 October 2010 the ENVISAT satellite was placed in a new orbit, 17.4 km lower than the original one, and a new mission phase was started allowing to save fuel and operate all payloads up to end of 2013 and to maintain orbit manoeuvre capabilities afterwards. The fuel saving is realized via the termination of the inclination control manoeuvre at the price of a drifting Mean Local Solar Time (MLST). The critical ENVISAT orbit lowering manoeuvre was successfully completed and all payloads were gradually resumed into operations since 27 October 2010.

This paper reports on the status of the ENVISAT Atmospheric-Chemistry instruments (GOMOS, MIPAS and SCIAMACHY) in the new orbit scenario and on the expectation for the remaining part of their mission lifetime. The instrument devices performances will be detailed with focus on the life-limited items and on the components that may be affected by the change of orbit altitude (e.g.: scanning mirrors). The calibration and re-characterization of the three instruments in the new orbit phase will be described with results and discussion on the available validation measurements. The quality of the operational products will be assessed and eventual discontinuities introduced by the orbit change will be underlined.

The investigations carried out so far have shown that the ENVISAT mission extension was fully successful for the three Atmospheric-Chemistry instruments and no shortcoming were highlighted in the new orbit scenario that may affect the quality of the products or introduce risks in the instrument operations in the coming years.