

Press Release

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HORIBA Jobin Yvon Gratings in Sentinel-3A satellite helps monitor land and sea



Sentinel-3A satellite flying over land and oceans

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The Sentinel-3A satellite was launched on February 16th, 2016 from Russia to its sun-synchronous orbit more than 800kms above to monitor the health of our earth's land and oceans.

Five instruments have been integrated on board, including the Ocean and Land Colour Instrument (OLCI), a spectrometer based on a custom HORIBA Jobin Yvon (HJY) concave diffraction grating.

The mission is based on two identical satellites orbiting in constellation to optimize the global coverage and data delivery. The second satellite Sentinel-3B will be launched in 2017 and is equipped with an OLCI instrument containing an identical, high grade HJY grating.

The mission is the result of close collaboration between the ESA and CNES space agencies, along with over a hundred organizations, which include THALES ALENIA SPACE as the global leader of the satellite project, SODERN in charge of the spectrometer manufacturing, and of course HORIBA JOBIN YVON who supplied the customized diffraction gratings.

"This is the third of the Sentinel satellites launched in less than two years – and it is certainly a special moment (...) with Sentinel-3 providing a whole range of new data, with unprecedented coverage of the oceans," said the Director of ESA's Earth Observation Programmes, Volker Liebig.

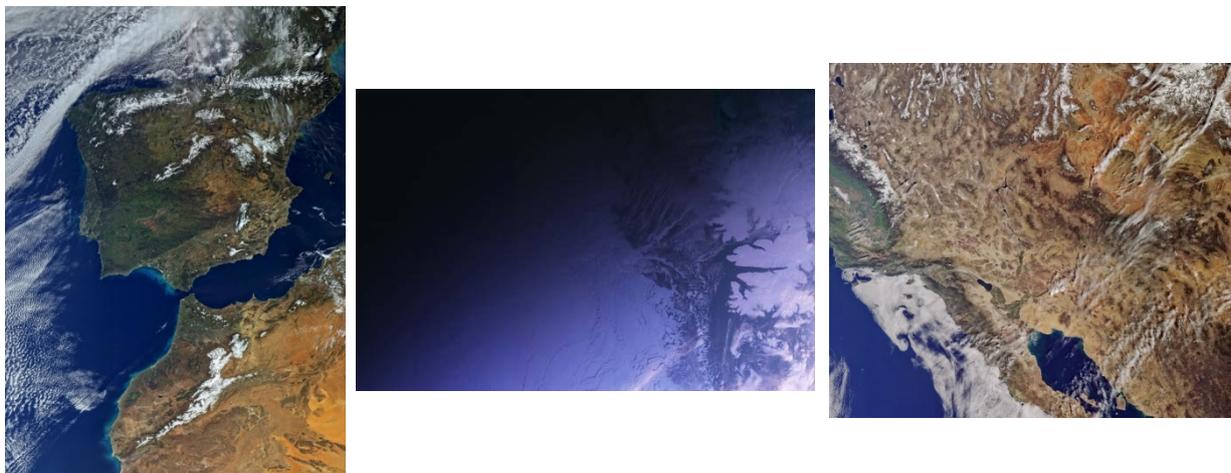
The OLCI instrument is a medium-resolution imaging spectrometer, based on the *Envisat's** MERIS spectrometer. The key optical component of this spectrograph is the concave holographic grating manufactured by HORIBA Jobin Yvon, with a groove density close to 130 gr/mm and dimensions of 70x46 mm working on the VIS-NIR spectral range. Thanks to the holographic recording and space-qualified (TRL 9) replication process, these gratings exhibited an optimized efficiency level on the spectral range of interest, a low stray light and no ghost.

OLCI features 21 distinct bands in the 400-1020 nm spectral region tuned to specific ocean colour, vegetation and atmospheric correction measurement requirements. Thanks to its 5 cameras, this instrument offers a spatial resolution of 300 m for all measurements, a swath width of 1270 km, and will provide global coverage of the entire earth globe every two days. OLCI's new eyes on Earth will monitor ocean ecosystems, support agriculture and provide data of atmospheric aerosol and clouds – all of which can bring significant societal benefits in many application fields.

Over oceans, it will measure the temperature, colour and height of the sea surface, as well as the thickness of sea ice. These measurements will be used, for example, to monitor changes in Earth's climate or in water pollution. Over land, this innovative mission will monitor vegetation health, detect forest wildfires and measure the height of rivers and lakes.

More generally, all of this data is completely available for any user worldwide, and will also be used to improve in weather forecasting.

The satellite has already delivered impressive first images thanks to its OLCI instrument.



Pictures from OLCI Instrument with HJY grating

Copyright: Copernicus Sentinel data (2016)

Left: Morocco's dry desert, snow-covered peaks of the Atlas Mountains and greener vegetation in northern areas of Spain.

Middle: The very first image from the Copernicus Sentinel-3A was taken by the OLCI instrument and shows the transition from day to night over Svalbard, Norway.

Right: Two weeks after launch, one of the first images from Sentinel-3A featuring California, Arizona and Mexico in the southwestern United States.

Following this successful Sentinel A/B project, HORIBA Jobin Yvon is proud to say they have again been chosen to supply the next series of space qualified diffraction gratings for future Sentinel C/D missions.

References:

*: <https://earth.esa.int/web/quest/missions/esa-operational-eo-missions/envisat>

<http://www.esa.int/>

<https://en.wikipedia.org/wiki/Sentinel-3>

HORIBA Jobin Yvon S.A.S. company, part of HORIBA Scientific (HORIBA Group), is a world leading supplier of spectroscopic and, analytical instruments and diffractive optics for research and industry.

HORIBA Jobin Yvon designs, manufactures and tests a large range of scientific diffraction gratings for Lasers, space flight and Synchrotron applications. HORIBA Jobin Yvon has been selected and has participated in a large number of NASA or ESA space-flight missions due to its long-standing reputation in developing very high performance diffraction gratings for spectrographs.

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