



## Factsheet

# The second satellite for the Copernicus environment programme

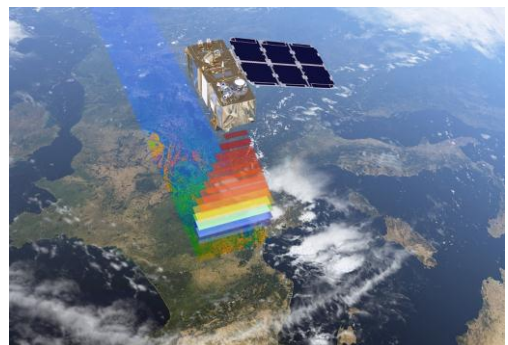
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On 23 June the European Space Agency ESA launches *Sentinel-2A*, the second in a series of missions forming the space component of the Copernicus programme, Europe's Global Monitoring for Environment and Security system. *Sentinel-2A* will collect data to observe vegetation, forest, lakes and rivers, to monitor land use and land changes, as well as to help deal with natural disasters. By participating in the ESA programme developing the Sentinel satellites, Switzerland gains access to the market and the data gathered, and as an ESA member state is able to cooperate on an equal footing with other governments. Several Swiss companies have been closely involved in developing *Sentinel-2A*.

### **Sentinel missions in the Global Monitoring for Environment and Security system**

Besides Earth observation satellites for meteorology and scientific investigation, ESA is developing a series of missions for the European Copernicus system, formerly known as Global Monitoring for Environment and Security (GMES). The European Commission has overall responsibility for Copernicus, which aims to achieve an autonomous observation capacity for environmental and security purposes, and to develop and operate geoinformation services covering the environment, climate protection, sustainable development, humanitarian aid and security. Observations from space provide important data. The space component in Copernicus involves infrastructure for observing Earth from space, and uses both existing national and international systems and develops its own special space missions, the Sentinels.

ESA is the main player in the Sentinel development programme, which was launched in 2005. There are five missions in total, each one focusing on monitoring specific aspects of the environment (oceans, land, vegetation, atmosphere etc.) The technical requirements for each mission are therefore different. Switzerland, which also sees space activities as an instrument to analyse and solve global issues such as climate change, environmental protection and disaster prevention, has supported this programme from its beginnings.



### **Sentinel-2 – the optical mission**

*Sentinel-2*'s main task is to gather data to observe vegetation, forest, lakes and rivers, to monitor land use and land changes, as well as to help deal with natural disasters (flooding etc.). Besides providing information about the state and growth of vegetation, this data can help determine the chlorophyll and leaf water content in plants, which gives an indication of potential yield. When combined with meteorological data and information about soil quality, the satellite measurements can also help to determine the optimum amount of fertiliser to be applied. By systematically mapping land cover, natural resources can be better managed, e.g. in forestry, the best rate of deforestation or reforestation can be determined, and in hydrology, water quality measured. The data is also used to monitor changes in land use, which may result in erosion, forest fires or floods.

The satellite carries a multi-spectral camera which takes photos of the Earth's surface in the visible, short-wave and infrared region of the spectrum. The spatial resolution is up to 10 metres (depending on the spectral channel). The *Sentinel-2* mission is actually made up of two satellites (*Sentinel-2A* and *2B*), which means that the whole of Earth can be covered in five days.

*Sentinel-2A* is due to be launched on 23 June 2015 (at 3:52am Swiss time) by ESA at its spaceport in Kourou (French Guyana). A Vega launch vehicle will transport the satellite, weighing 1.1 t, to a polar orbit at an altitude of 786 km. Following a test phase, *Sentinel-2A* will be operative for seven years. The launch of *Sentinel-2B* is planned for 2016.

### Swiss involvement in *Sentinel-2*

The main contractors involved in developing the *Sentinel-2* satellite are Airbus Defence and Space Germany and, for the multi-spectral camera, Airbus Defence and Space France.

The following Swiss companies have also been involved:

- APCO Technologies SA provided the primary and secondary structure, key components for the instrument. The primary structure bears the camera system and electronics, whereas the secondary structure, which has several layers of insulation, forms the protective casing for the sensitive instrument. APCO also developed a special set of mechanical equipment for safe handling, integration and transport of the satellite and instrument.



S-2A MSI structure during development. ©APCO

- RUAG Space developed the solar array drive mechanism (SADM) which aligns the solar arrays with the sun and ensures power supply to the satellite. This is key to powering the satellite and must be totally reliable.
- Clemessy Schweiz AG was responsible for providing special electronic equipment for testing the satellite's power supply during tests on the ground right up to the moment before count-down.

Data from Sentinel will be used by Swiss SMEs and research institutes to develop data-analysis algorithms and specific products.

Thanks to this involvement – made possible by Switzerland's contribution to ESA's Earth observation programme – and to the experience and expertise gained, Swiss science and industry will be able to play an active role in future development activities in the ESA programme.

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