Paper ID: 35553
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EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations (IP)

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AN EYE ON EARTH: AN OVERVIEW ON FUTURE OPTICAL EARTH OBSERVATION INSTRUMENTS

Abstract

The sustained and expanded observation of our planet from space is paramount to several aspects of Earth and atmospheric science. Due to more and ever better information about our planet and its processes on a global scale provided by Earth-orbiting satellites, one can see the bigger picture, track developments and act upon changes. Airbus Defence and Space, the world's second largest space company, is a well-established player partnering with numerous institutions across the globe realising such undertakings. The German part of Airbus Defence and Space has decades of experience in constructing a large number of optical instruments that successfully operate on scientific, Earth observation and meteorological satellites. The company has gained valuable experience from developing instruments such as MIPAS, a high-resolution Fourier-Transform Spectrometer limb sounder to measure atmospheric concentration profiles; or Sciamachy, an instrument for mapping the ozone layer and the development of the ozone hole. Presently, Airbus Defence and Space has under development a handful of instruments that will provide the scientific community with enhanced data: Sentinel-4, a dispersive imaging spectrometer to operate from geostationary orbit; Sentinel-5, a spectrometer that shall monitor trace gas concentrations globally; MERLIN, a LIDAR instrument to probe the atmosphere and determine the varying concentrations of methane; and METImage, to provide information on clouds, cloud cover, land surface properties, sea, ice and land surface temperatures. This paper provides an overview of the projects under development addressing its particular singularities, relevance and technological advancements, while providing an overall picture embracing the various key scientific goals.