

SpacEarth Technology

Company profile

SpacEarth Technology is a spin-off of the the Istituto Nazionale di Geofisica e Vulcanologia. We have a team of engineers, physicists and geologists with a long involvement in research and business management.

We design and develop applications, tools, software, hardware components and products for Aerospace, Maritime and Environment sectors in cooperation with the major European and Italian industries, organizations, universities and research centres.

It has long standing experience in the use of GNSS receivers and algorithms development for the monitoring, forecasting, mitigation and analysis of ionospheric disturbances and their effect on high-accuracy positioning. SpacEarth Technology is the owner of the international patent "Method for forecasting ionosphere total electron content and/or scintillation parameters" (2015) able to feed mitigation algorithms aiming at improving the accuracy of real-time GNSS precise positioning techniques (RTK, NRTK, and PPP) under harsh ionospheric conditions. This can contribute to improve the scenarios for the use of GNSS and SBAS (EGNOS) in several fields of application.

We also have remarkable experience in the use of optical and radar remote sensing and geodetic methods for the monitoring and analysis of geological and geophysical hazards. We provide advanced scientific products, as well as consultancy services, in these subjects. We provide tailored services and information products for geomorphological, structural and lithologic investigations, using optical and radar remote sensing data, from satellite and airborne (manned and unmanned) platforms.

Spacearth Technology has recently completed a feasibility study funded by the European Space Agency (ESA) for an innovative service offering a very accurate positioning service for the maritime market in the Arctic and sub-Arctic regions.

We are also involved in the BELS+ project, funded by the European GNSS Agency under the European Union's Horizon 2020 program, which aims to develop GNSS markets for EU companies and helps EU GNSS applications gain a foothold in Southeast Asia.

The company is involved in the mine seismology sector by performing the integration of tomographic (Local Earthquake Tomography) and geodetic (GNSS and SAR) data to obtain an all-embracing picture of the alteration of the state of the rock mass during mining operations, useful to safety planning of mining activities. Here we received funding from the European Institute of Innovation and Technology (EIT) – Raw Materials and have active contracts with major mining companies.

Products | Services | Applications | Technologies

GNSS high accuracy positioning service: a patented service able to forecast minutes in advance the ionospheric parameters and provide a mitigation solution. It provides high accuracy GNSS services and overcome economic losses due to large positioning errors under disturbed ionosphere for commercial applications such as precision agriculture, mining, dredging, constructions, offshore operations, aeronautics, land management and geodesy/land surveying.

Ground deformation monitoring and source analysis: we provide tailored services and information products for the monitoring of the ground motions and for the generation of models and scenarios, aiding in the deformation source analysis.

AIS ionosonde (Advanced Ionospheric Sounder): is an efficient and simple instrument capable to investigate Earth ionosphere. Designed and carried out employing the most advanced radar techniques, it allows to get an ionogram with only 250 W peak power, keeping dimensions and weight low with respect to similar instruments, and above all the reliability of the measurement due to the usage of coded pulses. Various specimens of AIS are currently working in ionospheric observatories placed in different continents.

IONOspheric Ray Tracing (IONORT): is an applicative software tool package for calculating a three-dimensional ray tracing of high frequency (HF) radio waves in the ionospheric medium.

Mines-In-Time: an automatic solution for monitoring in real time the stress alteration of the rock mass during mining operations, to be integrated in a traffic-light Decision Support System (DSS) and SAR-GNSS systems to avoid risks and cost related to mines collapse. The system is based on the innovative 4D LET algorithm (fourth dimension is time), able to analyze both natural and induced micro-seismicity (movements due to drilling or other mining operations).



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