

Consortium of major French actors in geoscience

As a consortium coordinated by the National Institute of Sciences of the Universe of the CNRS, Résif-Epos integrates the majority of French universities and organizations involved in geoscience research. It comprises more than a hundred researchers, engineers and technicians who work together on a daily basis in observatories and laboratories.

The Résif research infrastructure benefits from financial and staff contributions of all partners, as well as financial support from the French Ministry of Higher Education, Research and Innovation and from the French Ministry of Ecological Transition.

Consortium members

Centre national de recherche scientifique (CNRS-INSU), coordinator
Bureau de recherches géologiques et minières (BRGM)
Centre national d'études spatiales (CNES)
Commissariat à l'énergie atomique et aux énergies alternatives (CEA)
Institut français de recherche pour l'exploitation de la mer (IFREMER)
Institut français des sciences et technologies des transports, de l'aménagement et des réseaux (IFSTTAR)
Institut national de l'information géographique et forestière (IGN)
Institut de physique du globe de Paris (IPGP)
Institut de recherche pour le développement (IRD)
Institut de radioprotection et de sûreté nucléaire (IRSN)
Observatoire de la Côte d'Azur
Université Clermont Auvergne
Université Grenoble Alpes
Université de Montpellier
Université de Strasbourg
Université de Nantes
Université de Nice Sophia Antipolis
Université Toulouse III, Paul Sabatier



contact@resif.fr
www.resif.fr

Design graphique: Céline Emonet - Photos: Résif-Epos - Cover: GRN seismological station (Isère) - Résif-Epos 2020 edition



Résif ^{Epos}
Réseau sismologique et géodésique français 

A powerful scientific equipment for the global geoscience community

The construction of the French seismological and geodetic network was launched in the early 2000s to develop, modernize, and federate geophysical observation of the Earth's interior. This national research infrastructure is now part of the European Epos infrastructure and is actively contributing to its development. Beyond its European dimension, several components of Résif-Epos are also part of international federative structures.

The data collected by the hundreds of instruments deployed on the French territory reveal the structure, dynamics and deformation of the subsurface. Thus, Résif-Epos contributes to the sustainable management of natural resources (by improving our knowledge of natural groundwater reservoirs, for instance) and to geohazard mitigation (by contributing, for example, through the definition of the seismic hazard map in France).

Permanent networks deployed throughout the country

In seismology, Résif-Epos is developing a permanent and dense network of nearly 200 broadband seismic sensors over the entire continental France. It complements the permanent accelerometer network, mostly dedicated to the study of the strong motions of the Earth and essentially localized in the most seismically active areas in France (mainland and overseas territories).

These networks allow researchers to better image the Earth's interior, and thus to better understand our planet from the crust to the Earth's core. They are also the basic tool for real-time monitoring of seismic activity.

Résif-Epos also includes a permanent network of geodetic stations. These stations are used to measure ground displacement rates of a few tenths of a millimeter per year, and to monitor crustal deformation and the processes that create landforms and generate seismicity.

Résif-Epos also uses relative and absolute gravimeters for permanent observations. By measuring the slightest variations in the Earth's gravitational field, these instruments enable the study of mass distribution and dynamics inside the Earth (e.g. water masses or movements of the Earth's core)



Drilling installation of a seismometer



Geodetic station



iOSG supraconducting gravimeter

A pool of mobile instruments available to the scientific community

In addition to these permanent networks, Résif-Epos coordinates the deployment of various pools of mobile instruments. Those pools are used to temporarily densify measurements in France, or in areas of high scientific interest in Europe and around the world. Accessible to the entire academic scientific community, these temporary networks offer a large range of state of the art technologies and some truly exceptional pieces of equipment, such as the Absolute Quantum Gravimeter, based on the fall of cold atoms.

An exemplary scientific cooperation within the transversal seismicity action

The purpose of this transversal Résif action is to coordinate all the work on seismicity within a single structure, which involves fifteen Résif partners. Its objective is to increase the efficiency of the work carried out and to promote its visibility. This involves the production and distribution of outputs from Résif data, which focus on the knowledge of French seismicity and associated hazard.

An efficient information system

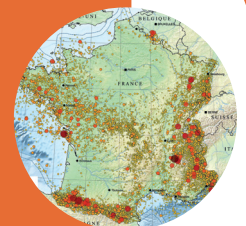
In order to manage the ten terabytes of data collected annually by these networks and equipment, Résif-Epos has developed a high-performance information system. Once collected, the raw data are analyzed, validated and then centralized to be archived and made available in real time and free of charge, following an open science policy. Every year, tens of millions of queries are submitted to the servers by scientists around the world.



Deployment of a Sismob seismological station



Deformation monitoring by GNSS



Instrumental seismicity map of continental France over the period 1962-2018