

Laser Lightning Rod

Funded under the Horizon 2020 programme, the LLR project aims to investigate and develop a new type of lightning protection.

A fet-open project

Funded under the Horizon 2020 European programme, the LLR project aims to investigate and develop a new type of lightning protection based on the use of upward lightning discharges initiated by a high-repetition-rate multi-terawatt laser. Through a process called laser filamentation, a low-density channel created by the laser will operate by promoting the initiation of upward discharges to preemptively transfer cloud charges to the ground. The laser-based system could be easily deployable for the protection of vulnerable installations such as electrical plants, launching pad, airports... Experiment will be performed at the Säntis lightning measurement station in Northeastern Switzerland, located at an altitude of 2 500 metres.

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7 european leaders

The LLR team is composed of leaders in the domains of lightning physics and laser development.

The project is carried out by a solid and experienced consortium composed of leaders in the domains of non-linear propagation of intense laser in the atmosphere, laser control of electric discharges, lightning physics, aeronautics and high power laser development: the Centre

National de la Recherche Scientifique, the University of Geneva, the Ecole Polytechnique Fédérale de Lausanne, the University of Applied Sciences and Arts of Western Switzerland, André Mysyrowicz Consultants, Trumpf Scientific Lasers and ArianeGroup.

A major breakthrough

A demonstration of laser-induced upward lightning would constitute a major breakthrough in lightning research with potentially profound impact on future lightning protection systems. Furthermore, the laser technologies developed during the project will have an impact in many technological and scientific domains, such as contactless power supply for fast trains, shooting of debris in orbit, water condensation in the atmosphere, remote Laser Induced Breakdown Spectroscopy (LIBS), or laser-based particle acceleration.

The LLR project aims to stimulate many new lines of scientific and technological development.

KEY FIGURES

3,9

Million euros have been invested in the LLR project

7

partners will join resources to develop the LLR

4

years will be necessary to achieve LLR goals

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