

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift-Off - Secondary Space Education (2)

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SPACE AND SCIENCE EDUCATION:
MOTIVATING LESSONS OF PHYSICS WITH EARTH OBSERVATION SATELLITES

Abstract

Using space activities for education and training purposes has been developed in France since the creation of CNES in 1962, with a close partnership with the ministry of education and specialized organisations such as Planète Sciences and Cité de l'espace. Their experience of the use of pedagogic and outreach tools, addressing either the space technologies (experimental rockets, satellites, stratospheric balloons), or their applications in our daily life (Copernicus and environmental monitoring, Galileo, Climate Change, etc.) confirm the benefits as attractive supports for education. A new experiment has been recently started in France. The objective is to validate the educational value of an integrated approach between satellites technologies and satellite applications.

In brief, is it possible to raise curiosity and interest of children between 12 and 18 for space physics by using stunning images acquired by Earth observation satellites?

With concrete examples based on Pleiades satellites and imagery, the paper explains in a first part how the satellite, from technical architecture to operational missions, can be a very effective and motivating tool to address science and physics secondary education.

Some practical lessons are described, highlighting the benefits with respect to the school curriculum, both for technologies (sun synchronous orbit or attitude control and physical laws, spectral bands and light composition, image acquisition and digital information, etc.) and for applications (image classification, rapid mapping, time series, etc.) Each example includes a short description of the targeted notion or learning, the correspondence with the school curriculum between 12 and 18 and the description of the proposed tools.

The second part shows how it could be the baseline for a very efficient and motivating tool to be used by teachers in their classrooms, as content for schoolbooks or for educational workshops or hands-on projects, proposed for instance by Planète Sciences in its education and outreach activities. Beyond this new way of teaching of physics, it shows also that the teaching activities around the satellite architecture, its components and its integration, the space environment is a very interesting approach to raise interest and awareness of scientific and technical careers, in particular in the space sector.

Based on first feedback from teachers and children, the conclusion provides an evaluation of the early results. It highlights also what are the conditions enabling a successful deployment on a wider scale and proposes some recommendations for further work. More information and first examples are available on www.regard-sur-la-terre.over-blog.com