

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
“Hands-On” Space Education (1)

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THE DEMOISELLE CUBESAT : FROM WATER ROCKETS TO ORBIT : EXPERIENCING BASIC
SPACE EDUCATION FOR REGIONAL BUSINESSMEN

Abstract

In La Reunion, a most active remote island region of the European Union, many technical businesses have grown over the past two decades to attain world class potential for some of them. But many are not fully aware of their new capability to do business with the whole planet in a global environment. The "Demoiselle" programme, a simple triple Cubesat programme, has a main purpose to give the consistence of the real thing for this planetary awareness, while at the same time providing an entry ticket for the regional businesses into the world space community.

The name "Demoiselle" derives from a French name for a variety of dragonfly, which the micro satellite will resemble when fully deployed. Two technical missions have been assigned to the satellite : to test the deployment of a sail by inflation of tubular structures, an experiment proposed by the solar sail association U3P, and to make a measurement of global temperature, an experiment inspired by the high concern for global warming that is prevalent in political institutions in La Reunion.

A stepped "hands-on" approach has been set for a progressive understanding and development of the project, to quickly test technical options and facilitate the acquisition of noticeable experience through a programmed increasing complexity of the management of the project. While the Demoiselle project is a 2-year scheme till the production of a ready-to-fly spacecraft, a 1-year HanaFlora simple cubesat-like student project has been established in parallel to evaluate the technological choices and have quick returns in terms of acquired practical knowledge. The first step is a test of mechanical sail deployment and onboard computer operating sequence with a launch on top of a water rocket during a science festival in La Reunion. Next major step is the launch of a "quasi-satellite", in cooperation with a Japanese experimental rocket team, during the annual national meeting with Cnes and the Planete Science association in mainland France. Nurtured by the experience of HanaFlora, technical studies for Demoiselle develop in parallel for construction to begin at the end of year 2009.

Delivery of the completed Demoiselle is expected at the end of 2010, but the search for a launch opportunity will begin with the construction phase, as soon as the end to 2009.