

## The Taranis Project: Scientific Objectives and Instrumentation

# Elisabeth Blanc[1]; Francois Lefeuvre[2]; Robert Roussel-Dupre[3]; Jean Sauvaud[4]

[1] Commissariat Energie Atomique; [2] Laboratoire de Physique et Chimie de l'Environnement, CNRS; [3] Los Alamos National Laboratoire; [4] Centre d'etude spatiale des rayonnements

TARANIS (Tool for the Analysis of RAdiations from lightNings and Sprites) is a microsatellite project of the CNES Myriade program, which use the concept of the Demeter microsatellite, launched in June 2004. Taranis is dedicated to the investigation of impulsive transfers of energy between the neutral atmosphere and the ionospheric and magnetospheric plasmas. The project plans to determine the time and latitude distribution and triggering factors of all possible emissions, measured simultaneously on the same satellite, to evaluate the related changes in the ionosphere and upper atmosphere. It plans to characterize the wave and particle emissions, as the relativistic electrons, predicted by the relativistic run away electron model. It also plans to determine the interaction of these emissions with the ionosphere and magnetosphere and to quantify the effects on radiation belts in relation with recent magnetospheric models. The project is multidisciplinary, based on different kind of sensors including: two micro cameras and three photometers (NIR to UV) looking at the nadir, X and gamma detectors (20 keV - 10 MeV), energetic electrons detectors (70 keV - 4 MeV) and electric and magnetic sensors in a wide frequency range (1 Hz - 30 MHz for the electric sensors). The orbit will be polar sun-synchronous at 650 km altitude, with a slow drift of the order of 2 local hours per year. The scientific payload weight is 30 kg, the power used by the scientific instrumentation is about 35 W, data of 'event' and 'survey' modes will be stored on a mass memory of 16 Gbits and transmitted by X link, to the CNES control station at Toulouse (F). Taranis, presently in phase A, could be launched in 2011.