Early Satellite Laser Ranging for Geodesy at CNRS, CNES and ONERA in France (Centre national de la recherche scientifique, Centre national d'études spatiales, Office national d'études aéronautiques et spatiales)

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Following the work of Alfred Kastler (Nobel Prize for Physics, 1966) on the "optical pumping" in the 1950s, new work began in France at CNRS, and industry in the early 60s to develop lasers, with very short pulses, powerful and emitting light in a very narow beam. The project was to develop a satellite tracking station to measure the distance satellite-station. The first echoes were obtained in January 1965 at the Observatoire de Haute Provence on the BEB American satellite. By observing the laser echoes on a photographic plate with a Schmidt telescope, the angular position of the satellite was determined in addition to the laser range measurement, which gave the 3 coordinates of the vector station-satellite. However, due to the dramatic improvements that were made in the precision of the range, the photographic plate became of a limited interest.

In 1967, CNES launched two satellites called Diademe D1C and D1D then Peole in late 1970 and later again Starlette equiped with retroreflectors on board. Several American satellites were also launched par NASA. International campaigns were then organized to track all theses satellites and to establish a global terrestrial reference system and to determine the gravity field of the Earth developed in spherical harmonic coefficients. French teams actively participated to these campaigns and promoted specifically the ISAGEX campaign (1971-1972). A national group of Research was established in 1971 in France to exploit from a scientific point of view all these data (GRGS or Groupe de recherche de géodésie spatiale). Visits of SAO and Goddard were extremely fruitful to develop all this cooperation.

A specific geodetic and geodynamic observatory was created near Grasse in France. Very good cooperation was also established in Europe with regular seminars in Luxembourg (journéees luxembourgoises de géodynamique at Walferdange).

The applications of space geodesy to geosciences was then developed in a American and international cooperation (see Willamstown workshop in 1969 in the USA) (i.e.later Crustal dynamics program, oceanography with altimetry program)

French teams participated also to Lunar Laser ranging at Pic du Midi (France). First returns were obtained on the Lunokhod 1 laser panel (made ine France and launched by the USSR) on december, 6, 1970.