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Author: Ms. Fatoumata Kebe
Université Pierre et Marie, France

Prof. Michel Dudeck
University Pierre et Marie Curie, France
Prof. Pierre Claudé
France

A COLLISION IN A CUBESAT CONSTELLATION

Abstract

The increase in cubesats and associated constellations in orbit may increase the risk of collision in the vicinity of these constellations. Several studies have shown that it is possible to drastically reduce the cost of access to space by replacing the usual massive satellite by constellations composed of cubesats. It is therefore prudent to ensure that these new space populations will respect the rules necessary to preserve the space environment. We also need to examine the consequences of such a collision event. QB50 is an European program led by the Von Karman Institute (VKI) in Belgium that will study the lower thermosphere (90-320 km) with a network of 50 cubesats. We made a virtual collision between a cubesat of the constellation with an other which is not part of the constellation. To be able to study a debris cloud it's necessary to develop new analysis tools. In that sense, we have studied several representations of the relative motion with different point of reference such as the objects implied in the collision or a cubesat of the constellation. Those new methods will allow to have a specific tool dedicated to the constellations of satellites.