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MODELLING A COLLISION IN A CUBESAT CONSTELLATION

Abstract

Cubesats which are centimeters sized-satellites will represent a large part of the space objects population in the years to come. As the issue about space debris is growing, we need to define tools to study the impact of a fragmentation inside of a constellation composed of cubesats, a new low cost architecture that drastically reduce the access to space. We did a simulation by using the data of the European project QB50 which is led by the Von Karman Institute in Belgium. QB50 consists in a constellation of 50 cubesats that will orbit in one orbital plane to study the lower thermosphere (90-320 km). We made a virtual collision between a cubesat of the constellation with an other one which is not part of the constellation. Here we present our results about the evolution of the debris generated and their impact on the remaining cubesats. By using several representations of the relative motion we introduce the first tools adapted to the case of a fragmentation inside a constellation of satellite.