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## STRAND-2: KINECTING TWO CUBESATS IN FLIGHT

**Abstract**

Surrey Satellite Technology Ltd and the University of Surrey have a long history of demonstrating new terrestrial COTS technologies in space, with the aim of reducing the cost of space applications. The STRaND-1 mission was the most recent example of this cooperative history, demonstrating the use of mobile phone technology as the central avionics for a nanosatellite. The STRaND-1 mission is planned for launch in 2012. The second mission in the STRaND programme is now under development, under the same funding arrangement as STRaND-1 (equally and internally funded by SSTL and SSC), and the aim is to be just as ambitious as the first STRaND mission. One key technology to demonstrate is the use of a Microsoft Kinect (TM) sensor suite in orbit, as a low cost alternative to lidar and machine imaging, to enable a docking mission between two CubeSats. If successful, the STRaND-2 mission would be the first demonstration of autonomous docking of nano-scale spacecraft. This paper discusses how the STRaND philosophy can be applied to a second mission. It then outlines the mission concept, highlighting key technology areas including the docking suite and propulsion system, before detailing some of the orbit dynamics of docking two CubeSats together. Initial mass and power budgets are provided with an overview of the system design. The paper concludes with a discussion on the future applications enabled by CubeSat docking technologies, including the AAReST mission concept - a collaborative mission between the University of Surrey and CalTech and NASA JPL.