

21st IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Small Distributed Space Missions (7B)

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LAUNCH, COMMISSIONING, AND OPERATION OF THE CANX-4/CANX-5 FORMATION FLIGHT
MISSION**Abstract**

The Canadian Advanced Nanospace eXperiment 4 and 5 (CanX-45) satellites, scheduled for launch in 2014, will demonstrate precise, autonomous formation flight at relative distances ranging from 50 to 1,000 meters, with relative position knowledge of better than 10 cm and control accuracy of less than one meter. This level of performance has never before been seen on nanosatellite class spacecraft to the author's knowledge. The two spacecraft are identical, at 7 kg and 20x20x20 cm each, with both nanosatellites based on the Generic Nanosatellite Bus (GNB) developed at SFL to enable a wide range of missions on a common platform. The mission will validate the various experimental technologies used to facilitate formation flight, including the Canadian Nanosatellite Advanced Propulsion System (CNAPS) for initiating, maintaining, and transitioning between formations, an InterSatellite Link (ISL) for communication between the satellites, and algorithms for autonomous formation control, including high precision relative navigation. The two spacecraft will be launched aboard the same vehicle, and released in different directions. This necessitates a swift commissioning period, as the distance between the two spacecraft created during this time must be recovered, and the relative orbits brought in phase before formation flight operations can begin. This paper will present results from the commissioning of both satellites, as well as the orbit acquisition and phasing performed during the initial months to prepare for precision formation flight.