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Aurora Flight Sciences Wins NASA Contract for Synthetic Imager Maneuvering Optimization (SIMO) System

Cambridge, MA, April 21, 2009 – The National Aeronautics and Space Administration (NASA) has awarded Aurora Flight Sciences, in collaboration with the MIT Space Systems Laboratory, a Small Business Innovative Research (SBIR) Phase 2 contract to develop a method for conducting multiple-spacecraft maneuvers to more efficiently synthesize astronomical images. The basic idea behind synthetic imaging is to use multiple small spacecraft, operating cooperatively, to synthesize the optical qualities of a much larger single spacecraft. Launch costs for small spacecraft are dramatically lower than those for large spacecraft and the potential for gradual system upgrades and replacement of failed elements is easier if the spacecraft are smaller. However, these advantages come with the challenge of coordinating the maneuvers of the multiple spacecraft to use minimal fuel and time to create the highest quality image.

Time and fuel-optimal maneuvers are only a part of the optimization problem. Selecting the maneuver waypoints (number and location) determines the quality of the synthesized image. The number of spacecraft, the size of their individual apertures and the type of propulsion system used also impacts imaging rate, propellant mass and mission cost. “Capturing all of these mission aspects in an integrated mission optimization framework helps mission designers to select the most appropriate architecture for meeting the needs and constraints of synthetic imaging missions,” said Joe Parrish, Aurora’s Vice President for Research & Development and the principal investigator for this project. “We anticipate that there are other applications both within NASA and beyond, and in military and commercial sectors.”

The SIMO technology is applicable to several NASA space-based astronomy missions. In addition, the US Department of Defense (DoD) is considering multiple-spacecraft missions for observation of terrestrial and spaceborne objects. NASA and the DoD are also interested in robust and efficient multi-vehicle reconfiguration for satellite servicing, docking, inspection and assembly of large apertures.

About Aurora Flight Sciences

Aurora Flight Sciences designs and builds robotic aircraft and other advanced aerospace vehicles for scientific and military applications. Aurora is headquartered in Manassas, VA and operates production plants in Bridgeport, WV and Columbus, MS and a Research and Development Center in Cambridge, MA. To view recent press releases and more about Aurora please visit our web site at www.aurora.aero.

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