

The Exo-Brake as an Inexpensive Means of Achieving Sample Return from Low Earth Orbit – Recent Flight

M. S. Murbach,¹ P. Papadopoulos,² A. Guarneros,¹ J. Wheless,¹ F. Tanner,¹ C. Priscal,¹ S. Smith,¹ A. Salas,¹ Z. Hughes,¹ R. Ntone,¹ Sanny Omar,³

¹NASA Ames Research Center, Moffett Field, CA 94035, ²San Jose State University, Aeronautical Engineering Department, One Washington Square, San Jose, CA, 95192, ³University of Florida, Gainesville, FL, 32611

Abstract: The Exo-Brake is a simple, non-propulsive means of de-orbiting small payloads from orbital platforms such as the International Space Station (ISS). Recent flight experiments involving the TechEdSat (TES) 6, 7, 8 are discussed in terms of both ‘targeted’ and ‘disposal’ de-orbit techniques.

These build on the previous flight experiments with fixed surface areas – and now involve improved uplink/downlink communication and GPS for improved targeting and control. The recent targeting experiments are discussed involving the TechEdSat-6,7,8 nanosatellites. The extension of the concept to a 1-stage, 3-stage, and lifting entry sample return system are discussed.