

# **Orbital rendez-vous and formation flying of nanosatellites using differential drag**

*L. Dell'Elce, A. Denis, G. Kerschen*

Space Structures and Systems Laboratory  
Department of Aerospace and Mechanical Engineering  
University of Liège, Belgium

*M. Romano*

Department of Mechanical and Aerospace Engineering  
Naval Postgraduate School  
Monterey, CA, USA

Nanosatellites – and CubeSats in particular – are now used for more and more ambitious missions. In this context, a key technology enabling observations in space is formation flying. The objective of this presentation is to describe formation flying of two nanosatellites in the framework of the QB50 constellation. Specifically, we propose to realize propellantless rendez-vous and formation flying based on the concept of differential drag. The first CubeSat, called target, will have a passive attitude control system that will align it with the local geomagnetic field. The second CubeSat, called chaser, will have a three-axes reaction wheel attitude control system. The cross-sectional area of the chaser will be controlled by changing its attitude, which, in turn, will modify the relative drag between the target and the chaser. To this end, optimal control techniques will be developed and employed for the design of this mission.

*Preference for presentation: oral*

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*Author for correspondence: Prof. Gaetan Kerschen*

*University of Liege  
Department of Aerospace and Mechanical  
Engineering  
Structural Dynamics Research Group  
Space Structures and Systems Laboratory (S3L)  
1, Chemin des Chevreuils (B52/3)  
4000 Liege, Belgium*

*Tel. : +32 (0)4 3664852*

*Fax. : +32 (0)4 3669505*