

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Kite propulsion EMMANUEL DU PONTAVICE, CHRISTOPHE CLANET, DAVID QUÉRÉ, Ladhyx, Ecole Polytechnique/PMMH ESPCI — Kite propulsion is one way to harvest wind energy. The typical force is 1 kilo Newton per square meter, which means that with kites in the range 100 to 1000 square meters, one is able to propel ships from the trawler to the tanker. Several scientific issues arise when trying to design kites of these sizes. They first need to take off and land autonomously. This leads to the use of kites with an inflatable structure that can be compact when stored but very rigid and light once in the air. For that matter, we studied the behavior of large inflatable structures under static and dynamic load. Then, the kite needs to stay in the air. However, it appears that under certain conditions, kites without active control tend to engage into large oscillations and eventually crash. Through wind tunnel experiments, we try to understand this flight behavior to find the conditions of stability.

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Date submitted: 31 Jul 2014

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