Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Distributed forcing of the flow past a blunt-based axisymmetric bluff body[1] THIERRY JARDIN, YANNICK BURY, ISAE, DAEP TEAM — The topology of bluff body wakes may be highly sensitive to forcing at frequencies close to intrinsic flow instabilities. In a similar way, a steady but spatially varying forcing at wavelengths close to specific flow instabilities can lead to analogous outcomes. Such forcing is commonly referred to as distributed forcing. However, although distributed forcing has proven to be a relevant control strategy for three-dimensional flows past nominally two-dimensional geometries (e.g. extruded circular cylinder at $Re > 180$), its impact on the flow past nominally three-dimensional geometries is still unknown. Here we assess the receptivity of the flow past a blunt-based axisymmetric bluff body to an azimuthally distributed forcing applied at the periphery of the bluff-body base. We show that the impact of RSPa, RSPb and RSPc instabilities on the drag fluctuations experienced by the bluff body can be suppressed, depending on the forcing wavelengths.

[1]The authors acknowledge the French Ministry of Defence and DGA for funding this work.

Yannick Bury
ISAE

Date submitted: 19 Jul 2012 Electronic form version 1.4