

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

The response of the wake past a bullet-shaped body to axisymmetric ZNMF forcing at high Reynolds numbers GEORGIOS RIGAS, AIMEE MORGANS, JONATHAN MORRISON, Imperial College London — It has been generally acknowledged that wakes of axisymmetric bodies are dominated by the shedding of large-scale coherent structures of azimuthal wavenumbers $m = \pm 1$. In the present study, the effect of harmonic axisymmetric forcing ($m = 0$) on the vortex shedding mode is investigated experimentally for $Re = 2 \cdot 10^5$. The shedding mode was found to be insensitive to low levels of axisymmetric excitation, whereas for moderate levels a strong parametric subharmonic (2:1) resonance occurs among them. We show that the predictions of a model based on two coupled Stuart-Landau equations describing the evolution of the vortex shedding mode, nonlinearly coupled with the forced axisymmetric mode, are in good agreement with the experimental findings. The model parameters are identified based on experimental data.

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Date submitted: 02 Aug 2012

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