



Kinematic dynamo simulations of von Kármán flows: application to the VKS experiment

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The VKS experiment has evidenced dynamo action in a highly turbulent liquid sodium von Kármán flow [R. Monchaux et al., Phys. Rev. Lett. **98**, 044502 (2007)]. However, the existence and the onset of a dynamo happen to depend on the exact experimental configuration. By performing kinematic dynamo simulations on real flows, we study their influence on dynamo action, in particular the sense of rotation and the presence of an annulus in the shear layer plane. The 3 components of the mean velocity fields are measured in a water prototype for different VKS configurations through Stereoscopic Particle Imaging Velocimetry. Experimental data are then processed in order to use them in a periodic cylindrical kinematic code. Even if the kinematic predicted mode appears to be different from the experimental saturated one, the results concerning the existence of a dynamo and the thresholds are in qualitative agreement, showing the importance of the flow characteristics.

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