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PIV Experiments on Vortex Induced Vibrating Cylinders at High Reynolds Numbers

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PIV measurements of the flow at rigid (horizontal) smooth or roughened cylinders of diameter 0.08 m, mounted to springs, moving with constant speed in a water tank of dimensions (25 m, 0.5 m, 1 m) (length, width, depth) are carried out at Reynolds number 100.000. The cylinder is allowed to vibrate in the cross-flow and in-line directions. The local turbulence distribution, the turbulent production, the Reynolds stresses, the eddy dissipation rate, and the various terms contributing to the turbulent kinetic energy budget (TKEB) are extracted from the PIV analysis. Detailed study of the flow separation and movement of the separation point at the shoulders of the cylinder is performed as well as recording the forces.

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