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Vortex shedding behind a sphere: transition between the stationary non-axysimmetric instability and the hairpin shedding SOPHIE GOUJON-DURAND, PMMH (UMR 7636 CNRS-ESPCI-P6-P7) and Univ. Paris 12, KONRAD GUMOWSKI, PMMH (UMR 7636 CNRS-ESPCI-P6-P7) and Warsaw University of Technology, PATRICE JENFFER, PMMH (UMR 7636 CNRS-ESPCI-P6-P7) and Univ. Paris 11, GILLES BOUCHET, IMFS, JOSÉ EDUARDO WESFREID, PMMH (UMR 7636 CNRS-ESPCI-P6-P7) — We perform numerical simulations and also experiments in water channels, on flows behind a solid sphere in order to study the transitional flow, in the range of Reynolds number between 200 and 300, which shows successively stationary axysimmetrical properties, stationary non-axysimmetrical instability and global temporal instability. The numerical study, with spectral methods, shows how the symmetry breaking in the recirculation bubble induces streamwise vortex. In addition we experimentally study the influence of the real conditions of holding of the sphere, on the stationary instability, Finally, we perform very controlled experiments forcing the streamwise vortex, in order to follow the dynamics of formation of the hairpin vortex shedding.

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