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Vortex rings behind an oscillating sphere VIATCHESLAV MELESHKO, Kiev National University, ALEXANDRE GOURJII, Institute of Hydromechanics, NAS Ukraine — The talk presents the results of an investigation of the formation, stability and control of localized vortex ring structures due to a periodic motion of a sphere in an inviscid incompressible fluid. The low order model based upon Dyson's vortex rings is employed. The intensity of generated vortex rings is estimated by the total vorticity, which takes place in a viscous boundary layer on the sphere. Numerical results of simulations of the transport processes in the near-wall zone, the determination of regions of low and high domains of passive admixtures are discussed. Finally, we compare numerical and analytical solutions with the results of analogue laboratory experiments for helium II.

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