Abstract Submitted
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Secondary instability in the wake of the flow around two circular cylinders in tandem arrangements[1] BRUNO CARMO, Department of Aeronautics - Imperial College London, JULIO MENEGHINI, Department of Mechanical Engineering - University de São Paulo, SPENCER SHERWIN, Department of Aeronautics - Imperial College London — The stability of three-dimensional perturbations about two-dimensional time-periodic vortex wakes of the flow around two identical circular cylinders in tandem arrangements is investigated. The centre-to-centre separation is varied from 1.5 to 5 cylinder diameters. Direct linear stability analysis is employed to determine the shape, wavelength and onset of unstable three-dimensional perturbations. In addition the non-linear character of the bifurcations is identified through three-dimensional direct numerical simulations performed in the vicinity of the critical points. It is found that, for configurations with large cylinder separations, the first stages of the wake transition are similar to those observed in the flow around an isolated cylinder, although the onset of the secondary instability occurs at a lower Reynolds number. In contrast, for small separations the transition route is significantly different, resembling that of the flow in a periodically driven cavity. For these configurations the onset of the first instability arises at a higher Reynolds number than in the case of an isolated cylinder.

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