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Kelvin-Helmholtz instabilities and Bénard Von-Karman Streets under lateral confinement LUC LEBON, PAUL BONIFACE, MATHIEU RECEVEUR, LAURENT LIMAT, Matiere et Systemes Complexes (MSC), CNRS and Univ Paris Diderot, Paris, France, FABIEN BOUILLET, Saint-Gobain Recherches, Aubervilliers, France — We have investigated Kelvin-Helmholtz instabilities in a confined geometry. We used a large tank of water with a belt moving at high speed on the central part of its free surface. The water below the belt is dragged by this one, while the excess is recirculating along the lateral walls. Using displaceable walls, belts of different widths, and modifying the water height, it is possible to tune at will the geometry. Depending on the involved ratios, two different behaviors are observed: (1) recirculation by the bottom of the tank, (2) recirculation along the walls with the growth of two coupled Kelvin-Helmholtz instabilities on each side of the belt. At long time scale, and depending again on the involved geometry, the flow evolves to a 3D turbulence or to a well organized Bénard-Von-Karman street, with a 2D spatial organization of the flow. The wave-length in each vortex row is in agreement with a stability calculations of point vortices developed in the 30's by Rosenhead.

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