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3. Flow Field in a Rotating Vane Flow Meter

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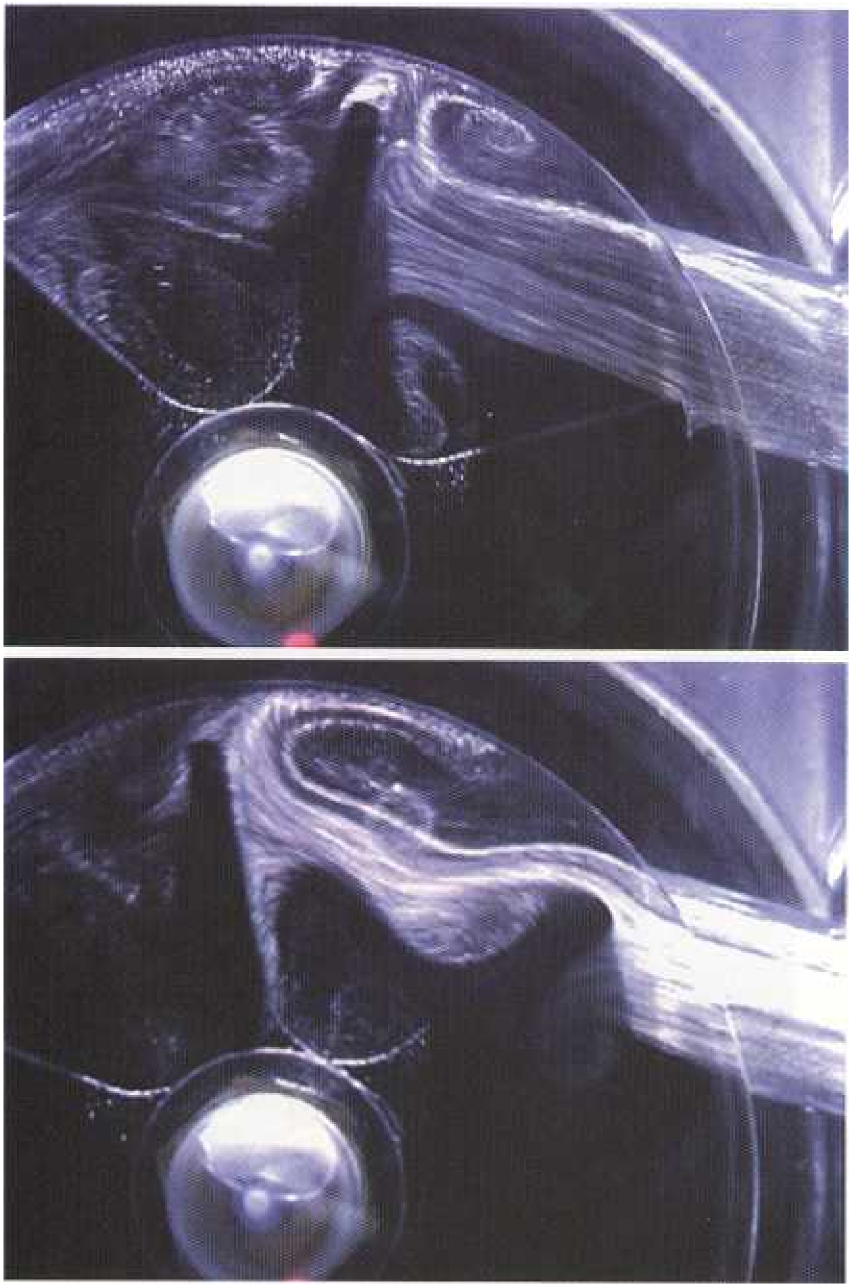

The flow field in a rotating vane flow meter is visualized by hydrogen bubble method. The meter is the size of 5.8 cm in diameter and 2.5 cm in height. Rotor with 6 vanes rotates due to inlet flow and the number of rotation is proportional to the flow quantity. The flow from the inlet makes a pair of vortices in a space between the vanes, and the vortices flow out from the outlet. The photographs are taken with 1/4 cycle difference at the cross section of the center of vane height using sheet light. Flow rate is 25L/H, and the Reynolds number based on the inlet diameter is about 800.

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4. 3D Flows Past Circular Cylinder of Low Aspect Ratio

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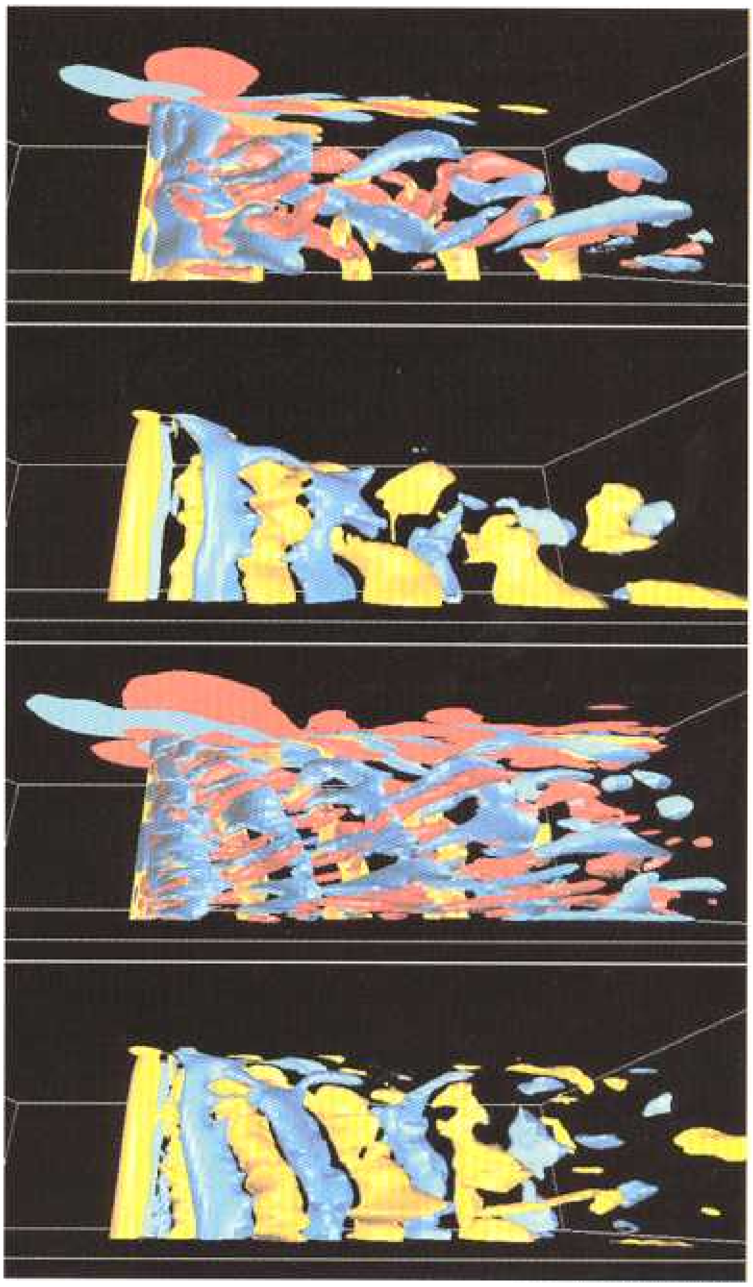

Flows past finite cylinders of low aspect ratio (length to diameter ratio=16) are studied using finite element simulations. The end-conditions are specified to model the effect of a "no-slip" wall. Only one half of the spanwise length is considered. At *Re*=300 Mode A and Mode B patterns of vortex shedding in addition to vortex dislocations are observed at different time instants. The wake transition regime, which is known to occur in the *Re* range 190-250 for large aspect-ratio cylinders, is either extended and/or delayed for a cylinder of small aspect ratio with "no-slip" walls. At *Re*=1000 Mode B is observed along with vortex dislocations. The "no-slip" walls result in oblique mode of vortex shedding.

The top two frames are for *Re*=300 while the lower ones for *Re*=1000 flow. The first and third frames show the isosurfaces of the streamwise (ω_x) and spanwise (ω_z) vorticity field [red: ω_x=0.2, blue: ω_x=-0.2, yellow: ω_z=0.3]. The second and fourth frames show the isosurfaces of the crossflow component of velocity field [blue: v=-0.2, yellow: v=0.2].