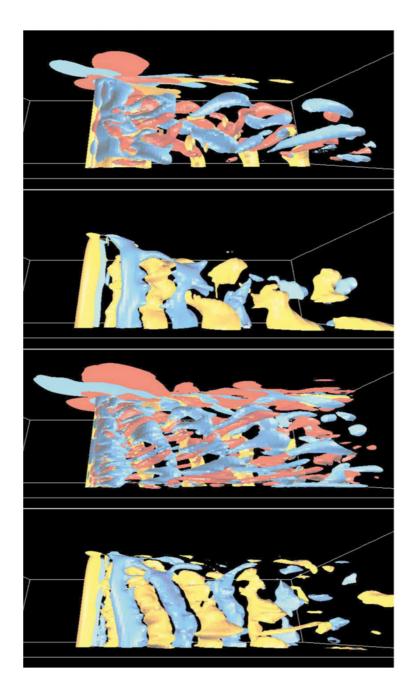
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## 4. 3D Flows Past Circular Cylinder of Low Aspect Ratio

Mittal, S.<sup>1)</sup>, Bankoti, H.<sup>1)</sup> and Dhananjay, G.<sup>1)</sup>

1) Department of Aerospace Engineering, Indian Institute of Technology, Kanpur, UP 208 016, India



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 ( $\omega_x$ ) and spanwise ( $\omega_z$ ) vorticity field [red: $\omega_x=0.2$ , blue: $\omega_x=-0.2$ , yellow: $\omega_z=0.3$ ]. The second and fourth frames show the isosurfaces of the crossflow component of velocity field [blue: $\upsilon=-0.2$ , yellow: $\upsilon=0.2$ ].