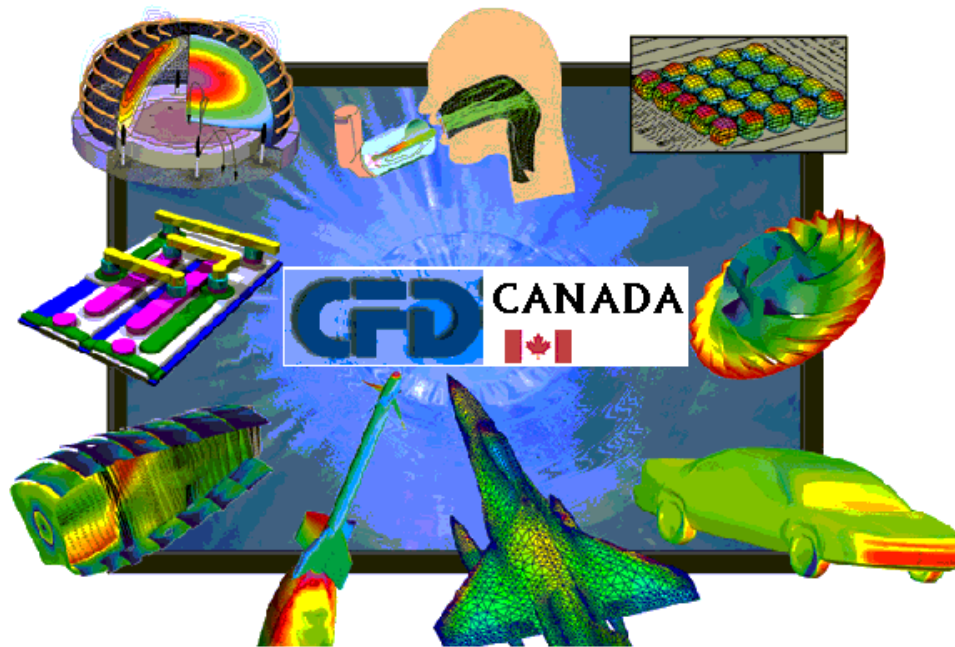


CFD Challenge - Transient Flow around Square

Preliminary Result (not for distribution)



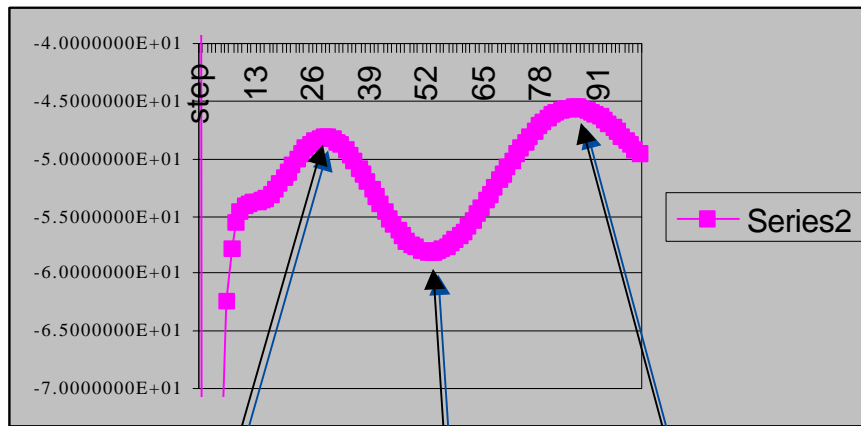
*Leading the Way for
Multi-Disciplinary Engineering Solutions*

Fritz Owens, Vladimir Kudriavtsev

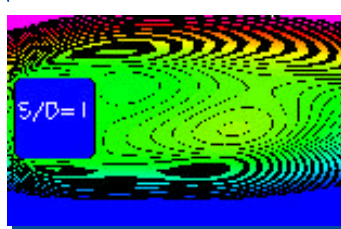
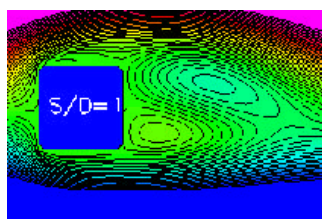
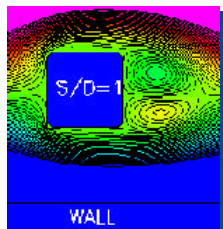
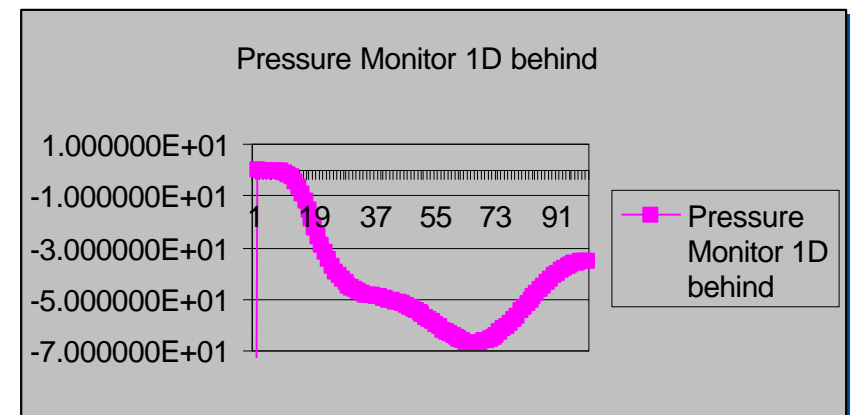
Pressure Oscillation - First Shedding Cycle



Pressure at the Cylinder's Base



Pressure at L=D behind the cylinder



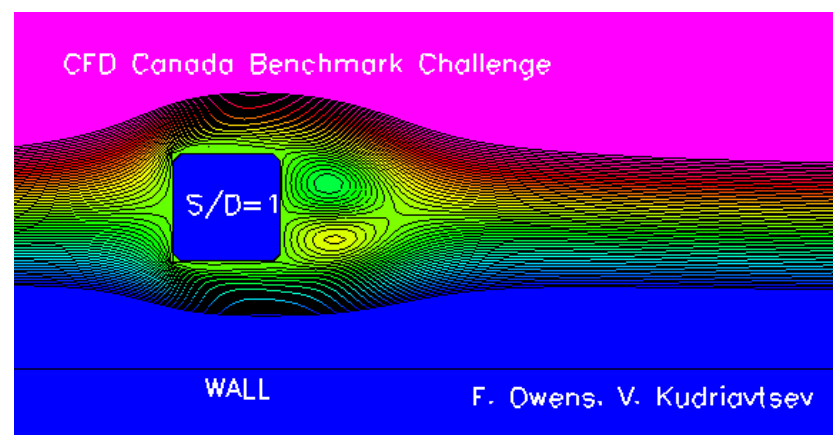
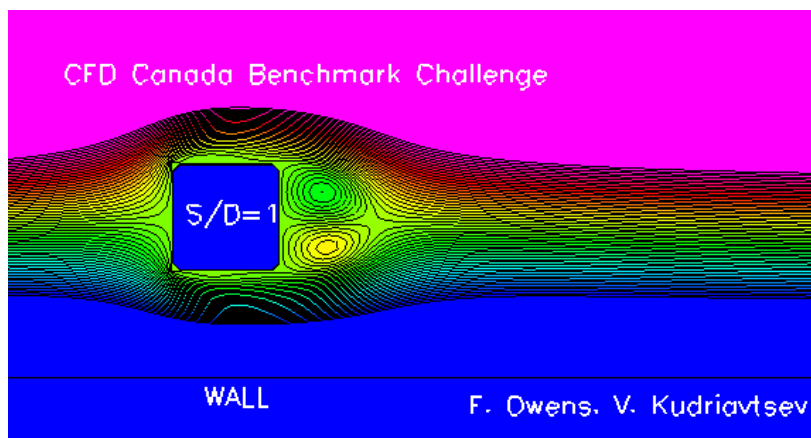
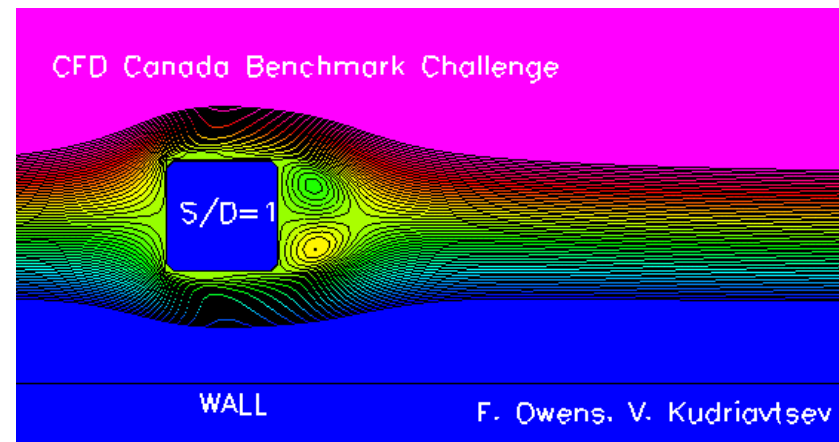
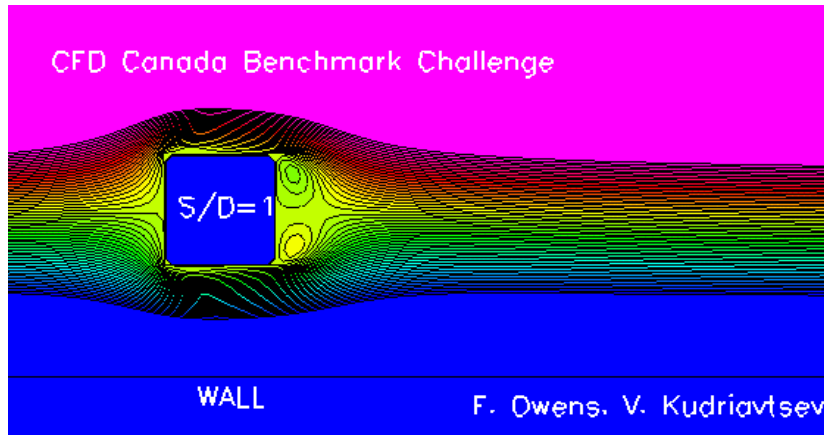
K-EPS RNG Turbulence Model was utilized.

Time period=0.03 sec, 100 timesteps, 15 iterations

First Shedding Cycle=57 steps (26/86)

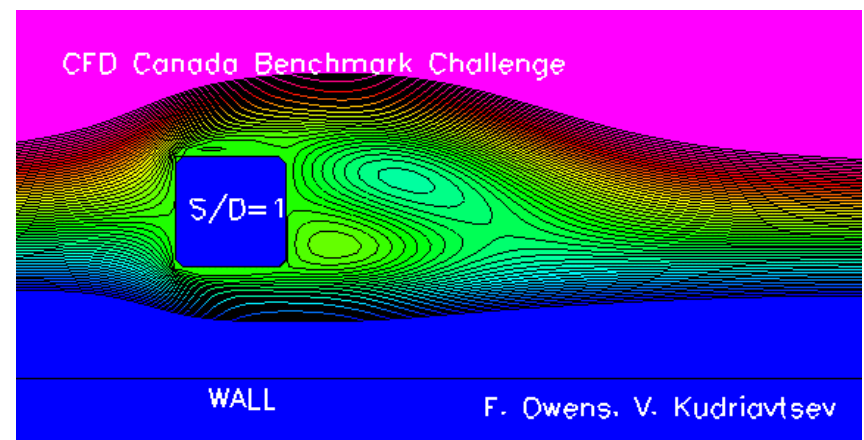
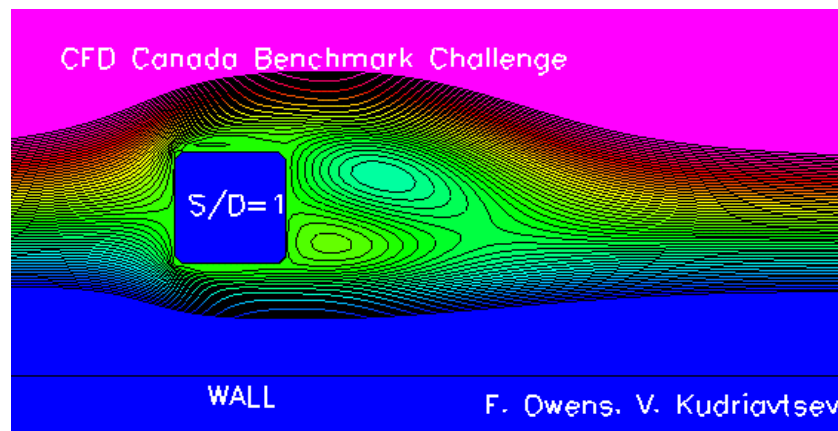
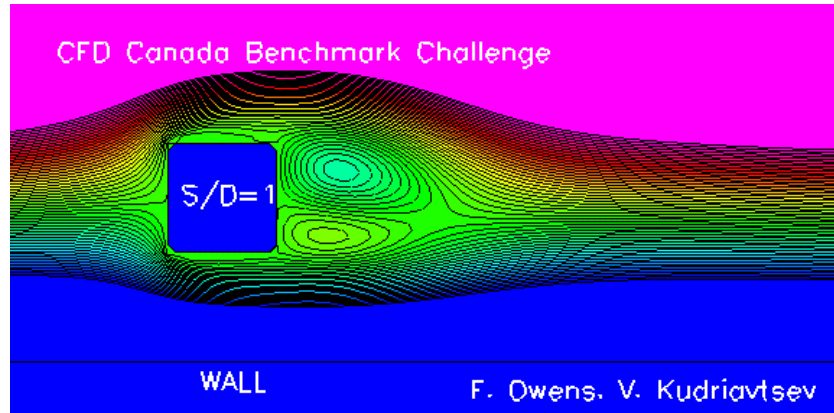
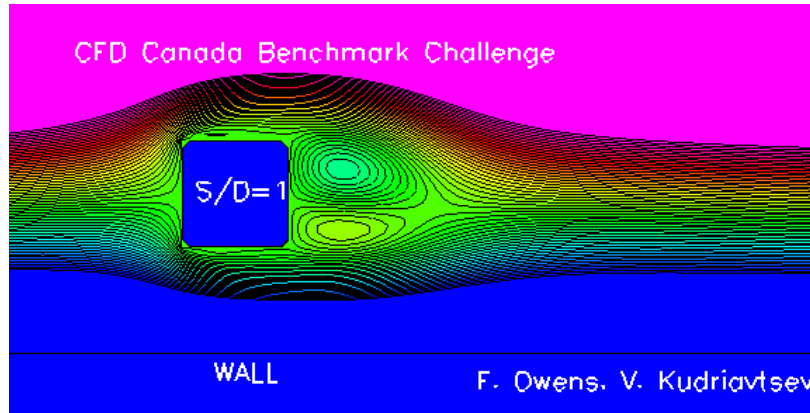
Ref. 2/ Fig. 2a shows 1st cycle=0.022 sec, Comp=0.018 sec. Difference=18%.

5,10,15,20



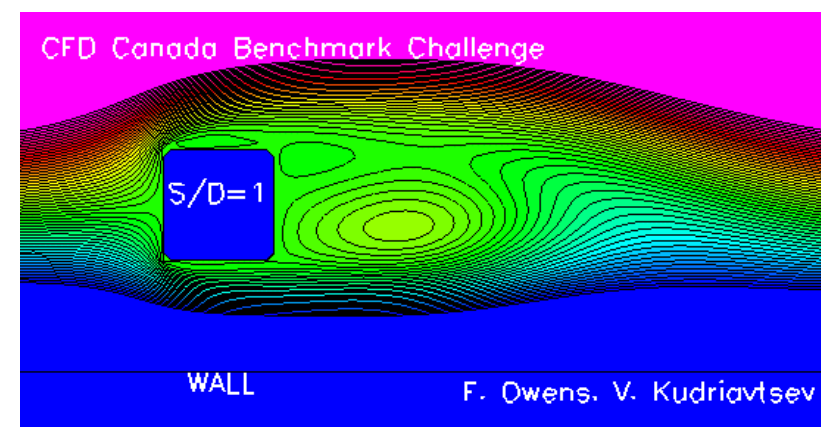
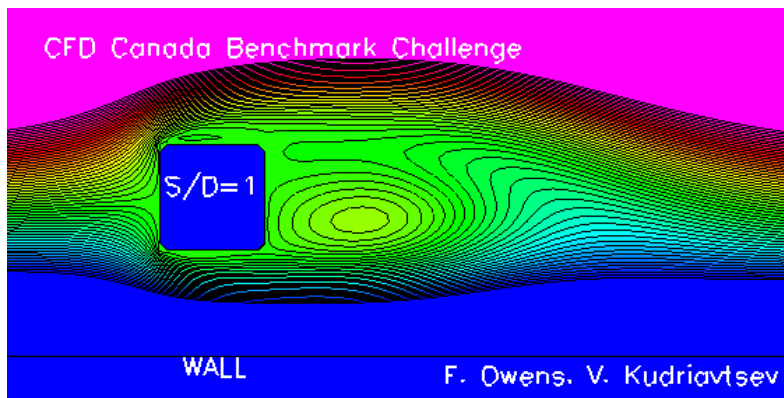
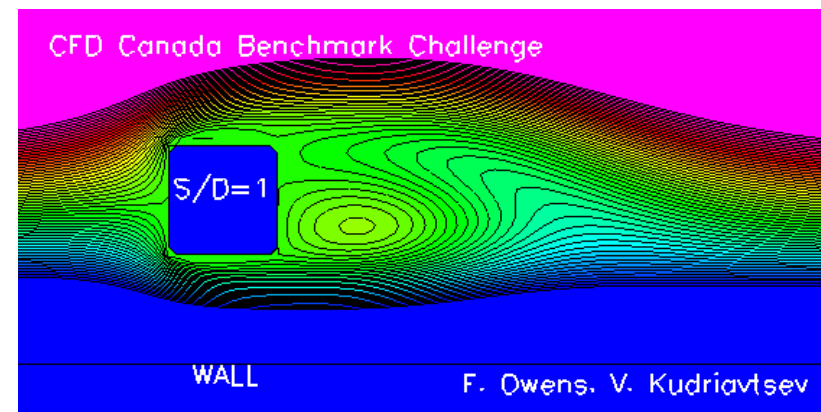
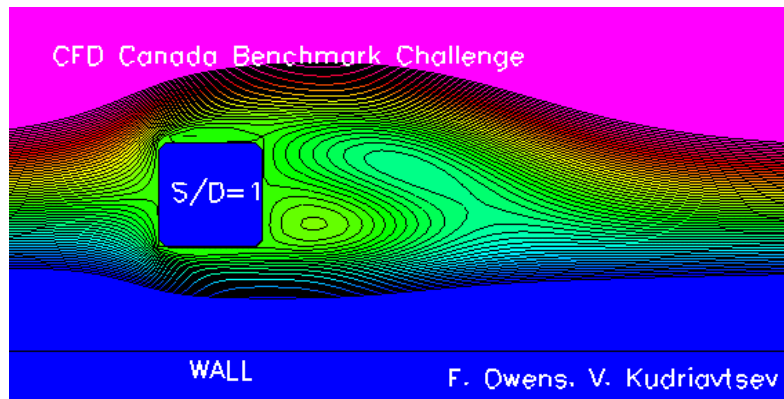
Transient Wake Formation

30,35,45,50



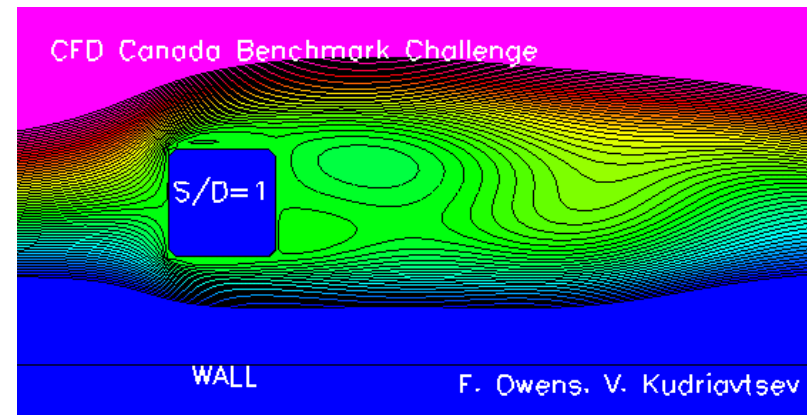
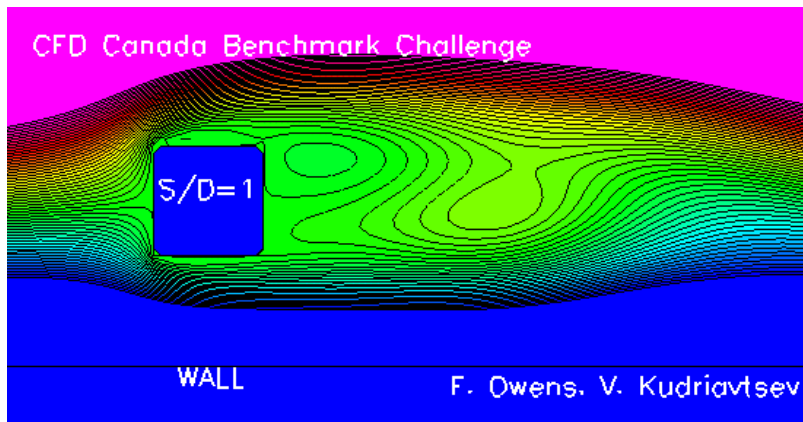
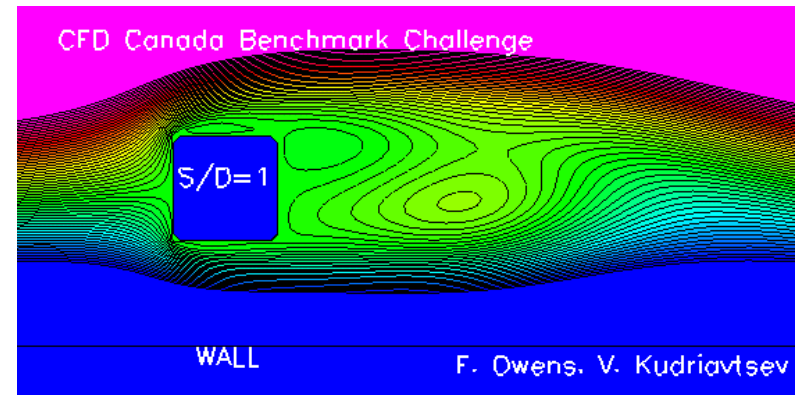
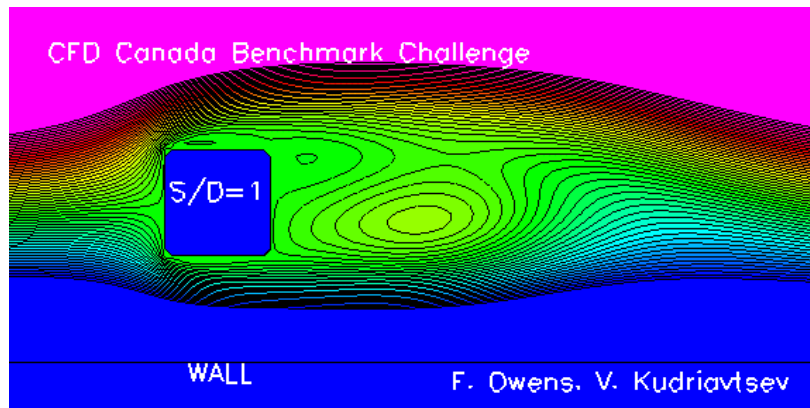
First Shedding -Growth of Upper Vortex

55,65,70,75



Upper Vortex Diffusion and Growth of Lower Vortex

80,85,90,100



Incipience of Upper Vortex and Lower V-Diffusion

References



[REF.1] Investigation of Pressure Field Structure and Vortex Shedding Suppression for Near-Wall Rectangular Cylinders

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[ReF. 2] Identification of Flow Structures during Irregular Vortex Shedding

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