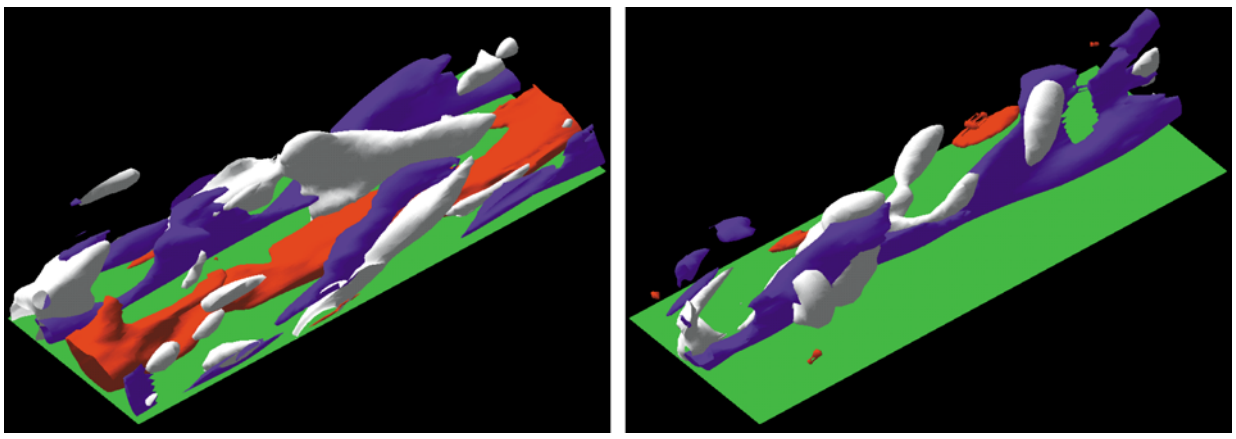
3. Quasi-coherent Turbulent Structures in a Channel with an Oscillatory Deformed Wall*

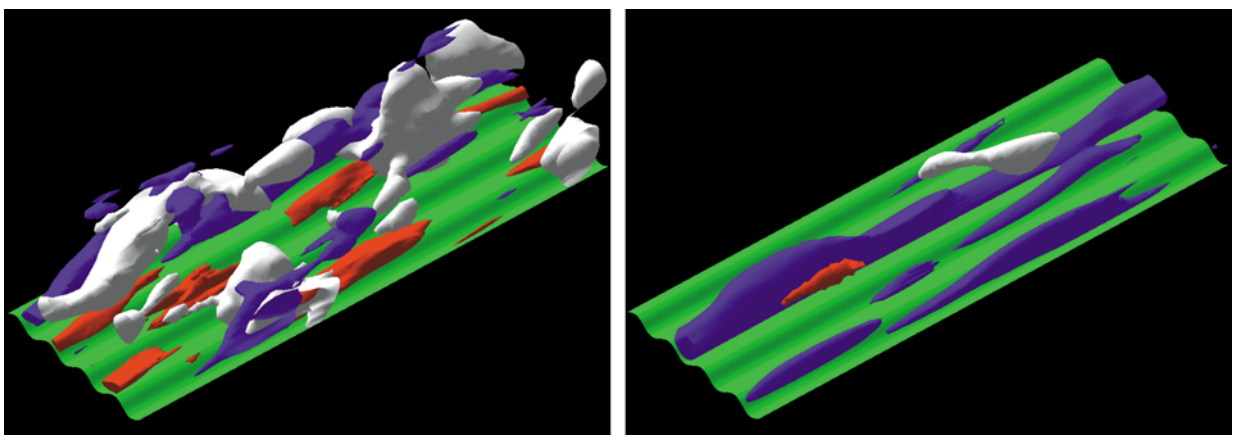
***Mito, Y.*[1] *and Kasagi, N.*[1]**

1) *The University of Tokyo, 7-3-1 Hongo, Bunkyo, Tokyo 113-8656, Japan*



(a) At a large skin friction instant. (b) At a small skin friction instant.

3.1 Turbulent coherent structures in the plane channel at large and small skin friction instants. White: vortical structures, blue: low-speed streaks, red: high-speed regions, flow direction: left to right.



(a) At a large skin friction instant. (b) At a small skin friction instant.

3.2 Turbulent coherent structures on the deformed wall at large and small skin friction instants. Structures as in 3.1.

In pursuit of a possible active feedback turbulence control method utilizing a flexible wall, a simple oscillatory mode of wall deformation is tested in a turbulent channel flow using direct numerical simulation. The deformation is uniform in the streamwise direction and spatio-temporally sinusoidal. It is found that both regular and deformed channel flows exhibit a long-period fluctuation of the skin friction coefficient. 3.1 shows typical quasi-coherent turbulent structures observed in the plane channel in large and small skin friction phases, whilst 3.2 shows those on the deformed wall. The activity of turbulent structures becomes highly intermittent with wall deformation.

*Mito, Y. and Kasagi, N. (1998) : DNS study of turbulence modification with streamwise-uniform sinusoidal wall-oscillation, Int. J. Heat & Fluid Flow 19, pp. 470-481.