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3D-PTV Measurement Results for the Wake of a Cylinder - Temporal Evolution of Turbulent Kinetic Energy

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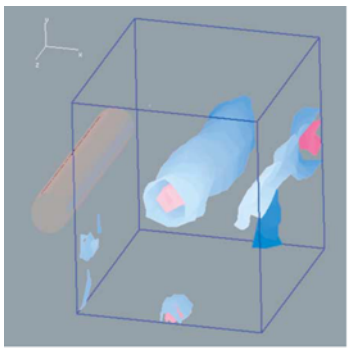

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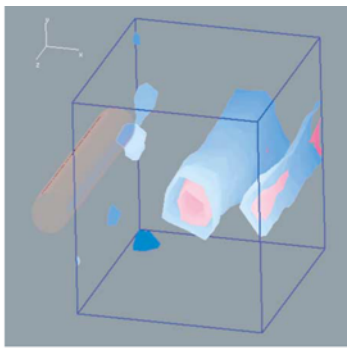

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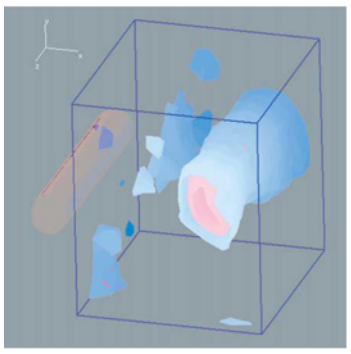

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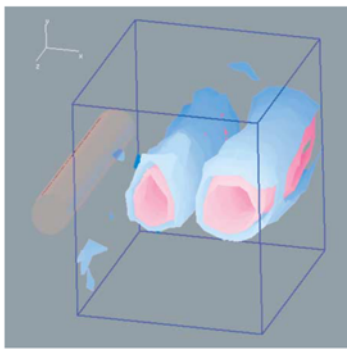

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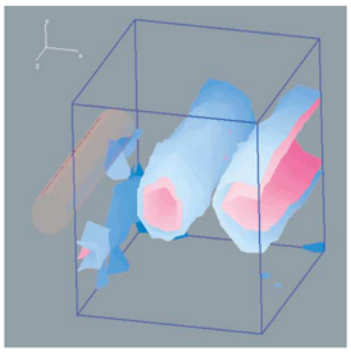

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These figures show a temporal evolution of the turbulent kinetic energy measured by a Genetic Algorithm (GA) based 3D-PTV technique. Two iso-values (red ones and blue ones) of turbulent kinetic energy are presented. Reynolds number is 420 with the diameter of the cylinder 10mm. These quantities were obtained by using the spatial distribution of instantaneous three-dimensional velocity vectors that were obtained by the GA based 3D-PTV. A spanwise distribution of turbulent kinetic energy is conspicuously seen. This roll cake-like distribution becomes larger with time increases maintaining its shape, which implies that most of the turbulent kinetic energy generated by the cylinder is convected downstream maintaining a constant distance (abut 1.5D) between the two spanwise distributions without a big change. One can imagine that main shapes of the spanwise vorticity (I component) are the same as the shapes of the distribution of turbulent kinetic energy.