Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

LES of flows around a circular cylinder at critical and supercritical Reynolds numbers YOSHIYUKI ONO, Obayashi Corporation, TETSURO TAMURA, Tokyo Institute of Technology — It is well known that the flow around a circular cylinder in the critical Reynolds number region represents an intricate combination of laminar separation, turbulence transition, reattachment and turbulent separation of a boundary layer on the cylinder. According to previous experimental studies, separation bubbles are formed in association with the process of a separation-to-reattachment flow on the cylinder. Also, the structure of a separation bubble and its behavior is sensitively changed, dependent on the Reynolds number from the critical to the supercritical region. In this research, LES method is applied to the flow around a circular cylinder in the supercritical as well as the critical Reynolds number region. Detailed structures of the separation bubble are investigated by using time-sequential computed results as the Reynolds number changes. We have found a divergent type of flow with 3D structures near the reattachment area and its physical meaning is discussed.

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Date submitted: 01 Aug 2008 Electronic form version 1.4