FMRC Fluid Mechanics Research Seminar Series

Large Eddy Simulation of Junction Flows

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ITU Uçak ve Uzay Bilimleri Fakültesi, TAV Konferans Salonu

Abstract: In this talk, we will present the numerical simulation of low and high Reynolds number junction flows as well as their experimental validation. Junction flows can be observed in many industrial and environmental applications such as flow at airplane wing-fuselage connections, air cooling around computer chips and flow around river hydraulic structures. Junction vortices remain coherent over long distances and cause high shear stress on the bottom surface. We will introduce two eddy resolving techniques, namely Large Eddy Simulation and Detached Eddy Simulation and discuss why they best fit to the simulation of these types of flows. We will conclude by identifying some potential applications of these techniques in aeronautical, mechanical and environmental engineering.

Biography: Gokhan Kirkil is an assistant professor in Faculty of Natural Sciences and Engineering at Kadir Has University. He received his BS in Civil Engineering from Middle East Technical University in 2002 and his MS and PhD in Civil and Environmental Engineering from University of Iowa in 2004 and 2008, respectively. Prior to joining Kadir Has University, he has worked as a postdoctoral researcher in Atmospheric, Earth and Energy Division at Lawrence Livermore National Laboratory in Livermore, California. His research interests include Large Eddy Simulation and Detached Eddy Simulation of flows in complex geometries; their applications in mechanical engineering, environmental fluid mechanics and renewable energy systems (particulary wind energy) and parallel and large scale computing. He is the recipient of 2011 Karl Emil Hilgard Hydraulic Award from American Society of Civil Engineers. He was also awarded the TUBITAK-CAREER award in 2013.