Kozo Fujii
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Biosketch:

Dr. Kozo Fujii is a Professor of Tokyo University of Science. He received his Ph.D. in1980 at the Institute of Space and Astronautical Science (ISAS), University of Tokyo. Spending several years at NASA Ames R. C. and other organizations, he returned the ISAS in 1988, now a part of Japan Aerospace Exploration Agency (JAXA). After his retirement of ISAS/JAXAon 2015, he joined Tokyo university of Science. He has been working on Computational Fluid Dynamics for almost 40 years since early days of CFD in aerospace. He also conducted a number of experimental studies for both high and low speed flows. He received many awards such as Daniel & Florence Guggenheim Lectureship Award from International Council of the Aeronautical Sciences (ICAS) in 2004 and others. He is a Fellow of AIAA and ASME in addition to many societies in Japan. He is currently a council member of SCJ (Science Council of Japan) and a member of Engineering Academy of Japan.

Title of the talk:

"Computational and Experimental Studies for Efficient Use of SDBD Plasma Actuators for Wing Flows"

Abstract:

The talk will be composed of two parts.

The first part summarizes our ten-years research activities on DBD plasma actuators. Both computational and experimental studies are conducted for understanding of the flow separation control mechanism of a DBD plasma actuator. Low speed flows over an airfoil are considered. As shown in the previous studies, the DBD plasma actuator, especially with the burst mode is shown to be very effective for controlling flow separation, when applied to the flows at an angle of attack higher than the stall. The analysis reveals that the flow structure includes three remarkable features that provide good authority for flow separation control. With proper setting of the actuator parameters to enhance the effective flow features for the application, good flow control can be achieved. Based on the analysis, guidelines for the effective use of DBD plasma actuators are proposed. A DBD plasma actuator is also applied to the flows under cruise conditions. With the DBD plasma actuator attached, a simple airfoil turns out to show higher lift-to-drag ratio than a well-designed airfoil.

The second part presents our recent activities. Studies for feed-back flow control, still better understanding of the flow control authority of plasma actuator, and on our recent effort toward the small model airplane flight test. The talk also refers to our experimental effort for the new application of plasma actuator to automobiles if time allows.