

NATIONAL INSTITUTE OF AEROSPACE TECHNOLOGY TRANSFER & COMMERCIALIZATION HUB



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Featured Technology: 17384-1

Status: Open for Licensing

ADVANCED MODIFIED HIGH PERFORMANCE SYNTHETIC JET ACTUATOR WITH OPTIMIZED CURVATURE SHAPE CHAMBER (ASJA-M)

The advanced modified high performance synthetic jet actuator with optimized curvature shape chamber (ASJA-M) is a synthetic jet actuator with a high efficient lower die volume reservoir. A new optimized arc-shaped chamber is used, instead of the conventional cylinder chamber to reduce the die volume of the jet chamber and increase the efficiency of the synthetic jet actuator. The shape of the curvature is dependent on the maximum displacement (deformation) profile of the active diaphragm. This enhances the mass flow rate so that the mass flow rate will be significantly higher than a conventional synthetic jet actuator.

In order to reduce the applied voltage and increase the force output of the ASJA-M, a multi-layer single crystal element is used for the piezoelectric diaphragm.

The ASJA-M is thin enough to install into the surfaces of rotorcraft blades or airfoils of a fixed wing aircraft.

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Meet the Inventor

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A valued member of NIA since 2003, Dr. Xu received his Ph.D. in Materials, from Penn State University in May 2002. Dr. Xu's dissertation was "Development of electromechanical devices based on newly developed electroactive P(VDF-TrFE) polymer." He received his M.S. in Electrical engineering from Penn State University in August 1999 and A Diploma in Physics from Shandong University, P.R. China in July 1987. From 1987 – 1995, Dr Xu was the Engineer and Associate Director of Ion Beam Laboratory, for the Institute of Physics, Chinese Academy of Science, Beijing, P.R. China. From 1997 – 2001, he was a Graduate Research Assistant for the Materials Research Laboratory. From 2001 – 2002, he was employed as a staff scientist at ICASE, NASA Langley Research Center, Hampton, VA.

Dr. Xu specializes in research in the following areas: Smart structures; Smart materials; and Nano smart materials and structures.

