Aerodynamics

The International Union of Theoretical and Applied Mechanics Symposium on High Angles of Attack Fluid Mechanics was held in Tokyo in September 1992. The research on flow separation and vortex flow around high-angles-of-attack bodies by experiment and numerical simulation were presented by researchers of universities, national institutes, and industries. The proceedings were published in August 1993 by Springer-Verlag. The 18th International Council of the Aeronautical Sciences was held in Beijing, China, in September 1992, and several papers from Japan were presented.

Recession of the world economies and the ongoing trend of contraction of the aerospace industries due to the cut-off of military demand will drive the international cooperation and collaboration of all aerospace areas, including computational fluid dynamics (CFD) and supersonic technologies. CFD is one of the most preferable fields in Japan and is expected to contribute to the advancement of the world aerospace technologies.

Material

The detail of composite material for the tail of the 777 has been clarified. The ratio of composite material in total structural weights is 9%. The fatigue test of a prototype under real load conditions is steadily proceeding. The CFRP materials have been requested from several suppliers.

Research for the realization of composite material by the National Aerospace Laboratory accomplishes the model of wing structure box of high quality made by adhering technology using one-direction tape and awaiting strength evaluation. The goal of this research is to verify the high failure tolerance characteristics to a more realistic level.

Operation and Maintenance

At the request of the FAA, inspection and maintenance of the pylon mid-spar phase pin of all 747 aircraft were performed after the accident involving El Al Israel 747-200F in Amsterdam in October 1992.

CD-ROM standardization of the maintenance manual is now being prepared by the Air Transport Association/Aerospace Industries Association and will soon be used by all Japanese airlines.

Industrial Technologies

During the design work process of the 777, each Japanese aerospace company has begun the manufacture of parts and its assembly. In the Japanese companies new assembly lines and new plants have been constructed for the 777, in preparation of its mass production.

Utilization of automatic design and manufacture using CATIA has become popular in the aerospace companies.

Equipment and Electronics Information System

The Ministry of Transportation of Japan has started the realization test of a crash avoidance system in cooperation with airline companies. Operation of the VHF data Link Processing System began at the 16 major airports in Japan in December 1992, transferring the ATIS and AEIS.

The research on a GPS navigation system, using satellites, is being conducted at several institutes and laboratories. The R&D of differential GPS (DGPS) is focused to improve the accuracy for measurement of position. The hybrid navigation system with DGPS, INS, and MLS is in its research phase.

Editorial Policy Statement on Numerical Accuracy and Experimental Uncertainty

The purpose of this statement is to reiterate the desire to have high-quality investigations with properly documented results published in the AIAA journals, and to clarify acceptable standards for presentation of numerical and experimental results. Recently there has been considerable concern with the quality of published numerical solutions. Also the practice of including error bars on experimental results is often lacking. In response to these problems, a succinct policy statement on these items is as follows:

The AIAA journals will not accept for publication any paper reporting (1) numerical solutions of an engineering problem that fails adequately to address accuracy of the computed results or (2) experimental results unless the accuracy of the data is adequately presented.

The implementation of this policy will be at the discretion of the Editors and Associate Editors of the journals.

The accuracy of the computed results is concerned with how well the specified governing equations in the paper have been solved numerically. The appropriateness of the governing equations for modeling the physical phenomena and comparison with experimental data is not part of this evaluation. Accuracy of the numerical results can be judged from grid refinement studies, variation of numerical parameters that influence the results, comparison with exact solutions, and any other technique the author selects. The validity of the accuracy estimation will be judged by the reviewers of the paper. An estimate of accuracy of the numerical results must be presented when comparisons with other numerical and experimental results are given, and when new results of the au-

thor will likely become data for future comparisons. Since accuracy of various computed results obtained from a numerical solution can vary significantly, the accuracy of the result being used must be stated. Accuracy of results from a validated code must still be established to show that proper input parameters have been used with the code.

Estimates of experimental uncertainty are required for all plotted or tabulated data obtained by authors. If data from other workers are used, they require no uncertainty. Unless otherwise stated and properly referenced, it is assumed that the uncertainty of authors' output data is estimated by the small-sample method[1] with assumed odds 20:1. All reported data must show uncertainty estimates if used in text or tables; for example, $T = 642 \pm 8$ K. All figures reporting new data should contain uncertainty estimates either on the figure with error bars in both coordinate directions or in the caption; for example, uncertainty in $T = \pm 8$ K at 20:1 odds. Investigations with limited data should present tabulated results in the paper while extensive data should be available elsewhere in tabulated form for use by other workers.

Finally, the accepted documentation procedures for a technical investigation must be used. For computational papers, the author must provide an adequate description of the numerical solution procedure, if not documented elsewhere. In addition, the complete governing equations must be specified with sufficient detail along with the input parameters to the code so that a reader could reproduce the results of the paper. For papers concerned with experimental test, thorough documentation of the experimental conditions, instrumentation, and data reduction techniques is required.

[1]Kine, S. J., and McClinstock, F. A., "Describing Uncertainties in Simple-Sample Experiments," *Mechanical Engineering*, Jan. 1953, pp. 3–8.