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## Scope

This journal is devoted to the applied science and engineering of aerospace computing, information, and communication. Original archival research papers are sought which include significant scientific and technical knowledge and concepts. The Journal publishes qualified papers in areas such as real-time systems, computational techniques, embedded systems, communication systems, networking, software engineering, software reliability, systems engineering, signal processing, data fusion, computer architecture, high-performance computing systems and software, expert systems, sensor systems, intelligent systems, and human-computer interfaces. Articles are sought which demonstrate the application of recent research in computing, information, and communications technology to a wide range of practical aerospace engineering problems.

Papers written for research-oriented readers should be sent to the Institute's research and development periodical, *AIAA Journal*. Papers on aircraft subjects should be sent to the Institute's *Journal of Aircraft*. Papers dealing with the advancement of the science and technology of dynamics and control should be sent to the Institute's *Journal of Guidance, Control, and Dynamics*. Papers related to the advancement of the science and technology of aerospace propulsion and power should be sent to the Institute's *Journal of Propulsion and Power*. Papers on missiles and spacecraft should be sent to the Institute's *Journal of Spacecraft and Rockets*. Papers concerned with thermophysics and heat transfer should be submitted to the Institute's *Journal of Thermophysics and Heat Transfer*. Papers that interpret or review new research, engineering, program developments, and future trends in the fields of space flight, rocketry, aeronautics, and hydronautics which are written for a broad readership should be sent to the Institute's monthly magazine *Aerospace America*.

## Submission of Manuscripts

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## 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 author 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<sup>1</sup> 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.

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<sup>1</sup>Kline, S. J., and McClintock, F. A., "Describing Uncertainties in Simple-Sample Experiments," *Mechanical Engineering*, Jan. 1953, pp. 3-8.

## **Ethical Standards for Publication of Aeronautics and Astronautics Research**

### **Preface**

The American Institute of Aeronautics and Astronautics (AIAA) serves the engineering and scientific aerospace communities and society at large in several ways, including the publication of journals that present the results of scientific and engineering research. The Editor-in-Chief of a journal of the AIAA has the responsibility to maintain the AIAA ethical standards for reviewing and accepting papers submitted to that journal. These ethical standards derive from the AIAA definition of the scope of the journal and from the community perception of standards of quality for scientific and engineering work and its presentation. The following ethical standards reflect the conviction that the observance of high ethical standards is so vital to the whole engineering and scientific enterprise that a definition of those standards should be brought to the attention of all concerned.

### **Ethical Standards**

#### **A. Obligations of Editors-in-Chief and Associate Editors\***

1. The Editor-in-Chief has complete responsibility and authority to accept a submitted paper for publication or to reject it. The Editor-in-Chief may delegate this responsibility to Associate Editors, who may confer with reviewers for an evaluation to use in making this decision.
2. The Editor will give unbiased and impartial consideration to all manuscripts offered for publication, judging each on its scientific and engineering merits without regard to race, gender, religious belief, ethnic origin, citizenship, or political philosophy of the author(s).
3. The Editor should process manuscripts promptly.
4. The Editor and the editorial staff will not disclose any information about a manuscript under consideration or its disposition to anyone other than those from whom professional advice is sought. The names of reviewers will not be released without the reviewers' permission.
5. The Editor will respect the intellectual independence of authors.
6. Editorial responsibility and authority for any manuscript authored by an Editor-in-Chief and submitted to the journal must be delegated to some other qualified person, such as an Associate Editor of that journal. When it is an Associate Editor participating in the debate, the Editor-in-Chief should either assume the responsibility or delegate it to another Associate Editor. Editors should avoid situations of real or perceived conflicts of interest. If an Editor chooses to participate in an ongoing scientific debate within the journal, the Editor should arrange for some other qualified person to take editorial responsibility.
7. Unpublished information, arguments, or interpretations disclosed in a submitted manuscript must not be used in the research of an Editor-in-Chief, Associate Editor, or reviewer except with the consent of the author.
8. If an Editor is presented with convincing evidence that the main substance or conclusions of a paper published in the journal are erroneous, the Editor must facilitate publication of an appropriate paper or technical comment pointing out the error and, if possible, correcting it.

#### **B. Obligations of Authors**

1. An author's central obligation is to present a concise, accurate account of the research performed as well as an objective discussion of its significance.
2. A paper should contain sufficient detail and reference to public sources of information such that the author's peers could repeat the work.
3. An author should cite those publications that have been influential in determining the nature of the reported work and that will guide the reader quickly to the earlier work that is essential for understanding the present investigation. Information obtained privately, as in conversation, correspondence, or discussion with third parties, should not be used or reported in the author's work without explicit permission from the investigator with whom the information originated. Information obtained in the course of confidential services, such as refereeing manuscripts or grant applications, should be treated similarly.

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\*Throughout this document, the term "Editor," when used alone, applies to both Editor-in-Chief and Associate Editor. When one or the other bears the specific responsibility, the full title is used.

4. Fragmentation of research papers should be avoided. A scientist who has done extensive work on a system or group of related systems should organize publication so that each paper gives a complete account of a particular aspect of the general study.

5. It is inappropriate for an author to submit manuscripts describing essentially the same research to more than one journal of primary publication.

6. An accurate, nontrivial criticism of the content of a published paper is justified; however, in no case is personal criticism considered to be appropriate.

7. To protect the integrity of authorship, only persons who have significantly contributed to the research and paper presentation should be listed as authors. The corresponding author attests to the fact that any others named as authors have seen the final version of the paper and have agreed to its submission for publication. Deceased persons who meet the criterion for co-authorship should be included, with a footnote reporting date of death. No fictitious name should be listed as an author or co-author. The author who submits a manuscript for publication accepts the responsibility of having included as co-authors all persons appropriate and none inappropriate.

8. It is inappropriate to submit manuscripts with an obvious marketing orientation.

### **C. Obligations of Reviewers of Manuscripts**

1. Inasmuch as the reviewing of manuscripts is an essential step in the publication process, every publishing engineer and scientist has an obligation to do a fair share of reviewing. On the average, an author should expect to review twice as many papers as an author writes.

2. A chosen reviewer who feels inadequately qualified or lacks the time to judge the research re-reported in a manuscript should return it promptly to the Editor.

3. A reviewer of a manuscript should judge the quality of the manuscript objectively and respect the intellectual independence of the authors. In no case is personal criticism appropriate.

4. A reviewer should be sensitive even to the appearance of a conflict of interest. If in doubt, the reviewer should return the manuscript promptly without review, advising the Editor of the conflict of interest or bias.

5. A reviewer should not evaluate a manuscript authored or co-authored by a person with whom the reviewer has a personal or professional connection if the relationship would bias judgment of the manuscript.

6. A reviewer should treat a manuscript sent for review as a confidential document. Its contents, as well as the reviewers' recommendations, should neither be shown to nor discussed with others except, in special cases, to persons from whom specific advice may be sought; in that event, the identities of those consulted should be disclosed to the Editor.

7. A reviewer should explain and support judgments adequately so that Editors and authors may understand the basis of the comments. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation.

8. A reviewer should be alert to failure of authors to cite relevant work by other scientists. A reviewer should call to the Editor's attention any substantial similarity between the manuscript under consideration and any published paper or any manuscript submitted concurrently to another journal.

9. A reviewer should not use or disclose unpublished information, arguments, or interpretations contained in a manuscript under consideration, except with the consent of the author.

### **D. Obligations of Engineers and Scientists Making Statements to Society at Large**

1. A scientist or engineer publishing in the popular literature has the same basic obligation to be accurate in reporting observations and to be unbiased in interpreting them as when publishing in a technical journal.

2. A scientist or engineer should strive to keep public writing, remarks, and interviews as accurate as possible.

3. A scientist or engineer should not proclaim a discovery to the public unless the support for it is of strength sufficient to warrant publication in the technical literature. An account of the work and results that support a public pronouncement should be submitted as quickly as possible for publication in a technical journal.

### **Acknowledgments**

The ethical standards embodied in this document were adopted by the AIAA Publications Committee on 16 August 1989 and are endorsed by the Editors-in-Chief. With minor changes, these standards are adopted from those published by the American Geophysical Union and are used with their permission.

## **AIAA Manuscript Review Process**

This description of AIAA manuscript review procedures is given so that authors, reviewers, and readers will better understand the paper selection and publication process. The first step in manuscript evaluation is an examination by the Editor-in-Chief of papers submitted to the journal. The Editor-in-Chief first tests the manuscript for the several criteria of subject scope, archival editorial style, apparent technical validity, topical importance, timeliness, relationship to prior publication, conciseness, appropriate references, and length. Precise requirements are given on the inside back cover of each journal issue.

### **Formal Review**

If it passes these first tests, the paper is sent to that journal's Associate Editor with the most direct knowledge of the subject matter and of expert reviewers in the field. The Associate Editor then evaluates the paper according to the same criteria and, in most cases, has the paper sent to two or more reviewers in the field for confidential review. The review report form (reprinted here) is designed both to encourage the reviewer's objectivity and to ensure the thoroughness of his or her evaluation.

Considerable significance is attached to the review reports. Each reviewer is asked to judge the technical validity of the manuscript and the extent of its advance beyond work previously published. The reviewer is asked also for advice concerning the specific merits and/or deficiencies of the manuscript. However, the decision to publish, to require major revision before publication, or to reject for reasons cited lies first with the Associate Editor and ultimately with the Editor-in-Chief.

It takes a minimum of several months (at least three) after receipt of the manuscript to accomplish the evaluation and review steps discussed above.

### **Revision or Rebuttal**

The next step is up to the author. If the paper has been rejected or if extensive revisions have been requested that the author believes are incorrect or unwarranted, he or she is entitled to submit a point-by-point rebuttal to the Editor's statement of reasons and the reviewers' comments. The rebuttal then is analyzed by the Editors, and a final decision is made, although there may be a need for an additional review cycle. Authors who revise their papers must make an effort to do so within the stated time period.

A reviewer who feels strongly that a particular paper should not be published may choose to write his or her criticism as a Technical Comment. The author then will be allowed to write a closing response for publication in the same issue as the Comment.

Formal acceptance will not occur until the author has complied with all of the revision requests (if any) made by the Associate Editor and has prepared the paper in AIAA archival style. (Or the Associate Editor may accept the author's rebuttal, as described above.)

### **Acceptance and Publication**

When a paper is formally accepted, it will be scheduled for publication in a forthcoming issue, and the author will be informed of the tentative date. Depending upon the number of papers awaiting publication and projected size of issues, this may require that papers be scheduled several issues ahead. When feasible, papers will be published in the order of their original receipt.

Galley proofs will be sent to authors for correction and release approximately two months prior to publication. In order to allow for late or nonreturn of galleys by authors and to provide the flexibility to meet issue-length and topic-mix constraints, issues will be overscheduled by about 25%. Thus, there will always be a certain number of papers held over for the next issue. All authors and co-authors receive a complimentary copy of the issue in which their papers appear.