50 years of the International Journal of Fracture

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Published online: 18 March 2015
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The International Journal of Fracture started publication in the year 1965 under the title *International Journal of Fracture Mechanics*. Instigated by Professor Takeo Yokobori (Sendai, Japan), Professor Max Williams¹ established a journal that would “embrace a wide spectrum of materials and act as an outlet for contributions from workers in all fields of fracture”. Professor Williams assembled an impressive Editorial Board that helped generate a truly international dimension to the journal right from its inception. The word “Mechanics” was dropped from the journal title quickly in order to accommodate all perspectives on fracture, not just mechanics. This Journal has now completed 50 years of publication, helped a nascent field grow into a major discipline, witnessed the launching of more journals devoted to the topic, maintained its international reach, and continued to be at the forefront of current developments.

We celebrate this landmark achievement this year by bringing out a number of special articles labeled “Special Invited Article Celebrating IJF at 50”. These articles were solicited based on a list generated by the

Board of Regional Editors; the main goals of these articles are to summarize the progress and capture the state-of-the-art in the various topics within fracture, and to provide some perspectives on future directions. The first volume of the year contains nine such articles; in subsequent volumes throughout the year we intend to publish other articles under this heading.

While citation counts and the h-index (and its variants or derivatives) have become important metrics in assessment of the performance of individual researchers, the impact factor appears to be the key metric for journals. While the academic community is quite aware of the limitations in the use of the journal impact factor, and there is still a clamoring for “high” impact factors, we argue that this is not necessarily the best or the only measure of a journal’s true impact. Based on data obtained from the ISI Web of Science on January 2, 2015, we examine the trends in citations for articles published in the *International Journal of Fracture*. Figure 1 shows the cumulative citations to articles published in the Journal over the past 50 years; for example, there were nearly 82,000 citations to the 6218 articles published in the journal over the past 50 years. This cumulative number of citations increased at an ever increasing rate with nearly 5000 citations in 2014 as shown in Fig. 2. These trends point to the longevity of the content that is examined further in Figs. 3 and 4. Figure 3 tracks the number of citations to articles published in the first 25 years; from 1965 to 1989, as more articles were published in each subsequent year, the number of citations in each year to articles published in all

¹ Max Williams passed away on September 18, 2013. See a tribute to Max in this issue of the Journal.

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Fig. 1 Cumulative number of citations to articles published in the *International Journal of Fracture* during 1965–2014

Fig. 2 Number of citations in each year to all articles published in the *International Journal of Fracture* during the previous years

Fig. 3 Number of citations in each year to articles published in the *International Journal of Fracture* during the first 25 years of the journal (1965–1989)

previous years increased nearly quadratically. Between 1990 and 2014, a period covering the next 25 years, the total number of citations each year to content published in the first 25 years remained nearly constant at about 1200 per year, at a citation rate of about 0.53 per article per year. This trend is also observed in shorter time

intervals; Fig. 4 shows the citations per year to articles published from 2004 to 2009. Between 2010 and 2014, the number of citations per year to articles published in the previous 5 years has been around 1100 per year. These trends reflect the fact that archival value of the articles is high. Sustained citations to articles spanning

Fig. 4 Number of citations in each year to articles published in the *International Journal of Fracture* during the years 2004–2009

half-a-century clearly indicates that articles published decades ago still retain their relevance and importance to researchers in the area and this is the true impact of the journal on the discipline. As a measure of this impact, we have generated a “Top 100” list, shown in Table 1: these are the top 100 cited articles published in the *International Journal of Fracture*, as recorded by the Web of Science on January 1, 2015.

For this impact to continue in the coming decades, the Journal must maintain its high standard in the peer-review process. This is only possible through the diligent and voluntary support from the community of peer-reviewers; we have relied on numerous researchers from around the world to evaluate manuscripts for suitability for publication in the *International Journal of Fracture*. In addition to the invaluable advice from members of the Board of Regional Editors, each year we use nearly three to four hundred unique reviewers to evaluate manuscripts. We owe a large debt of gratitude to the Board Members and reviewers for helping maintain the quality of the Journal and we thank all the reviewers who have contributed mightily to the Journal over the past five decades.

Over the past decade, the rejection rate in the Journal has climbed steadily; in 2013 and 2014, the rejection rate was around 69–72%. The Journal has a policy of rejecting without review articles that fall in the following categories that can be classified as “routine”: routine calculations of stress-intensity factors for specific geometrical and loading conditions, unless they are an intermediate step in the context of solving a larger problem; routine characterization of material properties using well-established standard techniques, with-

out adding significant insight into fracture phenomenon, process or analysis; routine simulations using well-established numerical tools, unless the simulations are performed in the context of demonstrating the simulation tools by comparison either to physical experiments or to simulations at other scales. On the other hand, we encourage submission of manuscripts that fall within the scope of the journal: the Journal is an outlet for original analytical, numerical and experimental contributions covering all aspects of fracture and encourages contributions which provide improved understanding, characterization, and modeling and simulation of the mechanisms of micro and macro fracture in all materials, and their engineering implications.

The Journal made a transition to the electronic age some time ago with numerous features; submissions and reviews have been coordinated online through Editorial Manager for more than a decade. All volumes of Journal content are available in digital form. The Journal launched an Electronic Supplementary Materials segment to articles published in the Journal. Such supplementary materials could include data archives, high resolution photographs, videos or animation, computer code segments, or other materials that enhance the quality and utility of the published article. These materials are permanently archived, hyperlinked to the journal article, and available through the Journal portal. Copyright agreements associated with the print and electronic versions of the main article also apply to the Supplementary Materials associated with the article. While the print version is quickly becoming less relevant, the Journal offers free color

Table 1 The top 100 most cited articles published in the *International Journal of Fracture*, as recorded by the Web of Science on January 1, 2015

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2. Cotterell, B; Rice, Jr 1980. Slightly curved or kinked cracks. 16: 155–169 Citation on 01/01/2015: 1010
3. Sih, GC 1974. Strain energy density factor applied to mixed mode crack problems. 10: 305–321 Citation on 01/01/2015: 933
4. Sih, GC; Paris, PC; Irwin, GR 1965. On cracks in rectilinearly anisotropic bodies. 1: 189–203 Citation on 01/01/2015: 682
5. Tvergaard, V 1982. On localization in ductile materials containing spherical voids. 18: 237–252 Citation on 01/01/2015: 665
6. Suo, ZG; Hutchinson, JW 1990. Interface crack between 2 elastic layers. 43: 1–18 Citation on 01/01/2015: 494
7. Kanninen, MF 1973. Augmented double cantilever beam model for studying crack-propagation and arrest. 9: 83–92 Citation on 01/01/2015: 465
8. Zhurkov, SN 1965. Kinetic concept of the strength of solids. 1: 311–322 Citation on 01/01/2015: 408
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printing for all art work in the journal. Authors are encouraged to exploit these features and make illustrations visually appealing and technically more accessible to the audience. The Journal has recently launched a mobile app for iOS and Android devices for easy access to the Journal content: (<http://www.springer.com/?SGWID=0-0-1500-2191121-0>). A blog is also available for readers to interact with authors and the community; an entry is created upon publication of each article at: <http://blogs.springer.com/frac/>.

As we celebrate our accomplishments in the past five decades, we welcome your comments, criticisms and suggestions regarding the Journal so that we can continue to provide an appropriate forum for intellectual exchange on all aspects of fracture.

Krishnaswamy Ravi-Chandar, Editor-in-Chief
Nathalie Jacobs, Senior Publishing Editor, Springer