Landmark Paper Index: Definition and Application to Rheological (η-) Journals

M. Kröger

Polymer Physics, Department of Materials, ETH Zurich, 8093 Zurich, Switzerland

*E-mail: mk@mat.ethz.ch
Fax: x41.44.6321076

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Abstract:
We define a Landmark Paper Index (LPI), calculate and analyze indices for all papers published in rheological journals ('η-journals') between 1990 and 2006. This paper offers some information about the criteria influencing the impact of publications on the (scientific) community. In opposite to the well known Impact Factor (journal sensitive) or the number of citations (article sensitive, publication year insensitive) the LPI helps to identify established and potential breakthrough contributions by considering the number of citations per year after publication, in a way which does not overestimate the few, highly cited, articles when performing averages. We discuss the effect of formal criteria on the LPI.

Zusammenfassung:
Wir definieren einen Landmark Paper Index (LPI), berechnen und analysieren Indizes für alle Artikel, die in rheologischen Journalen ('η-Journalen') zwischen 1990 und 2006 erschienen. Der vorliegende Artikel gibt Aufschluss über Kriterien, die den Einfluss von Publikationen auf die Leserschaft beeinflussen. Im Gegensatz zu dem wohlbekannten Impact Factor (Journal-sensitiv) oder der Zahl der Zitierungen (Artikel-sensitiv, Publikationsjahr-insensitiv) hilft der LPI dabei, etablierte und potentielle Publikations-Meilensteine zu identifizieren, indem er die Zahl der Zitierungen pro Jahr nach Veröffentlichung in einer Weise berücksichtigt, die die Zahl der wenigen sehr hoch zitierten Artikel nicht übermäßig berücksichtigt, wenn es darum geht, Aussagen über Mittelwerte zu machen. Wir diskutieren den Effekt formaler Kriterien auf den LPI.

Résumé:
Nous avons défini un Landmark Paper Index (LPI), calculé et analysé des indicateurs pour toutes les publications publiées dans des journaux de rhéologie ('η-journaux') entre 1990 et 2006. Cette publication fournit des informations sur les critères influençant l'impact des publications sur la communauté scientifique. Contrairement au fameux Impact Factor (dépendant du journal) ou au nombre de citations (dépendant de l'article, indépendant de l'année de publication), le LPI permet d'identifier des contributions marquantes établies ou potentielles en considérant le nombre de citations par an après publication, de sorte qu'il ne surestime pas le peu d'articles très fortement cités lors de l'opération de moyennage. Nous discutons ici de l'effet de critères formels sur le LPI.

Key words: Landmark Paper Index, Impact Factor, journal impact, author impact, article impact, criteria, evaluation, quality, breakthrough index, rheological journals

1 INTRODUCTION

In order to appreciate the need to define a novel index below, we start introducing a related, most often used measure in research evaluations, the so called ISI Impact Factor. It is in use to quantify quality of publications, effective prices of journals, and the scientific impact, not only of journals, but also of authors based on the number of articles and journals in which they published. Recent years have seen growing interest in the Impact Factor, and the dispute about its value [1 - 10]. The Impact Factor for a given year and journal is defined as the total number of citations received in that year to articles published in the previous two years, divided by the total number of citable items (source items) published by the journal in those two years. Clearly, according to its definition the Impact Factor depends not only on the number of citations, but also on what the ISI defines as a source item. When comparing the rankings of journals within a given subject, care must be exercised in attaching too much importance to apparent positions in the rankings [1-10]. Since the Impact Factor is an average measure, there is some element of error margin on either side. Recent citation analyses have estimated that the variations in Impact Factor due to statistical noise alone are as much as 40% for

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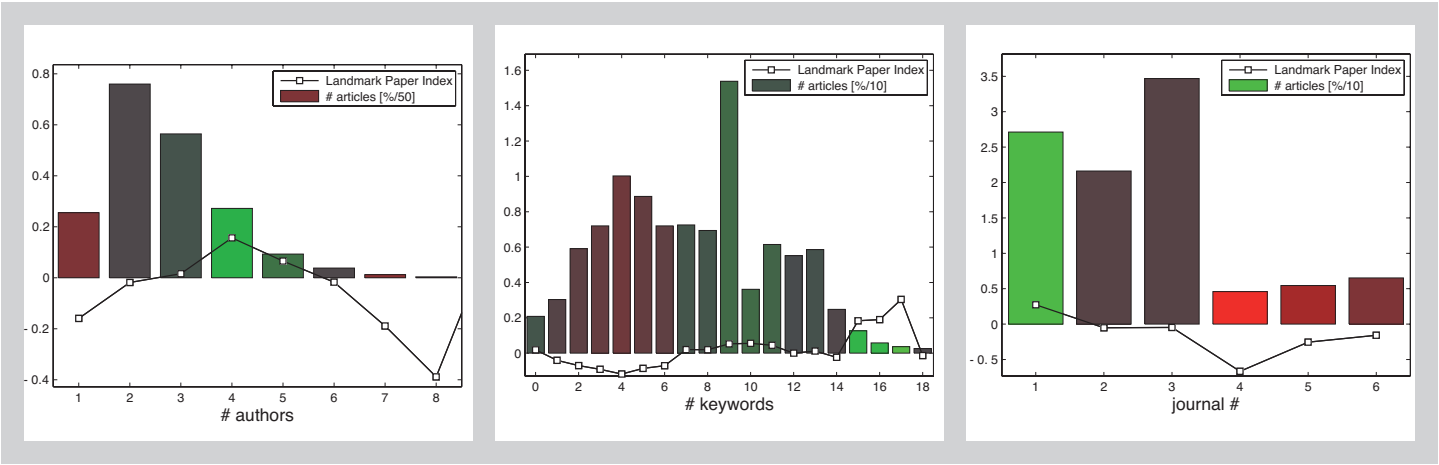

Figure 7 (left): Number of authors and their correlation with the LPI.

Figure 8 (middle): Number of keywords published with articles versus LPI.

Figure 9: LPI evaluated for all articles published between 2000 and 2005, shown are mean values for six η-journals in undisclosed order.

dozen of years have been published in non-rheological, often less specialized, journals. Such articles certainly help to consider η-aspects in interdisciplinary contexts. Finally, for those articles published in η-journals, and covered by ISI, we allow the reader to estimate the current and future relative impact of her/his articles in Fig. 10 as follows: read off a times cited value α for your personal number of years of publication activity in η-journals. Compare this number with the mean value of citations β for your own publications in η-journals. Your article impact is above average, if $\beta > \alpha$. Further, you can extrapolate the total number of citations and also estimate the current and future numbers of citations per year after publication by adapting the shape. If $\beta < \alpha$ please keep in mind that the plot is obtained from averaged data and therefore must not accomplish with your model.

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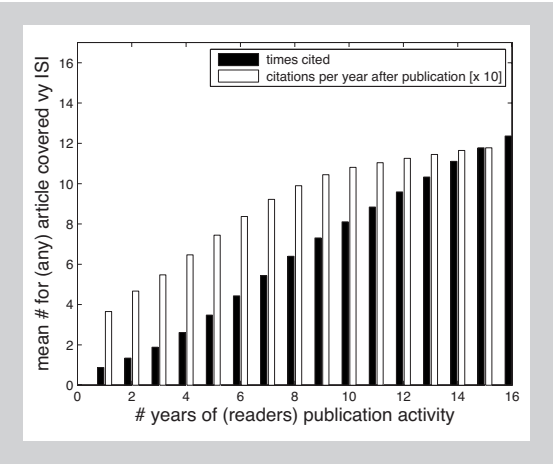

Figure 10:
For those articles published in η-journals, and covered by ISI, the reader can easily estimate the current and future relative impact of her/his articles by using this graph as described in the final text paragraph.

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