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Comprehensive *T*-matrix reference database: A 2006–07 update

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Abstract

This paper presents an update to the comprehensive database of *T*-matrix publications authored by us previously and mostly includes the publications that appeared since 2005. It also lists several earlier publications not included in the original database.

Keywords: Electromagnetic scattering; *T*-matrix method

1. Introduction

The original database of *T*-matrix publications was published in 2004 [1] and updated in 2007 [2]. We have made the necessary corrections and straightforward updates in these papers, and the result is posted at http://www.giss.nasa.gov/~crmim/. Given the ever-increasing popularity of the *T*-matrix approach (Fig. 1), we decided to publish a second update. As in [1,2], we adhere to the following general restrictions:

- With a few important exceptions, the database includes only publications dealing with electromagnetic scattering.
- As a rule, publications on scattering by isolated infinite cylinders and systems of parallel infinite cylinders in unbounded space are excluded.
- Publications on the Lorenz–Mie theory and its various extensions to radially inhomogeneous spherically symmetric scatterers are not included.
- The database includes only references to books, peer-reviewed book chapters, and peer-reviewed journal papers.

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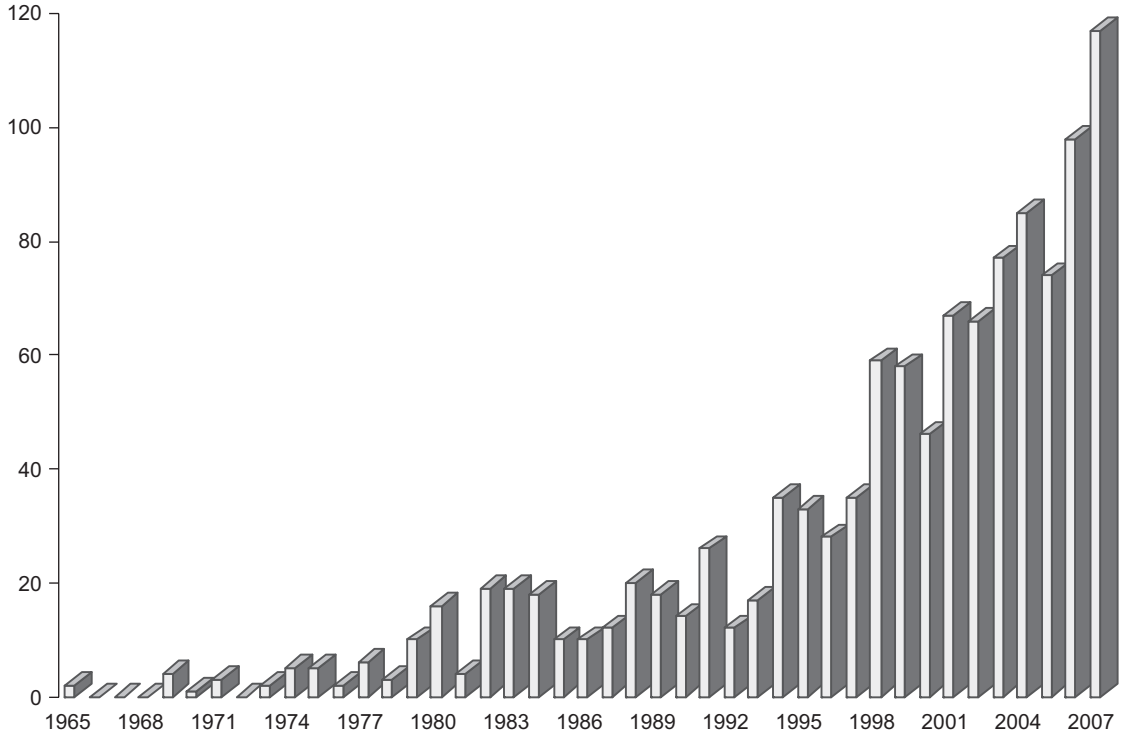

Fig. 1. Annual frequency distribution of the *T*-matrix publications related to electromagnetic scattering.

Also, we continue to use the following operational definition of the *T*-matrix method:

In the *T*-matrix method, the incident and scattered electric fields are expanded in series of suitable vector spherical wave functions, and the relation between the columns of the respective expansion coefficients is established by means of a transition matrix (or *T* matrix). This concept can be applied to the entire scatterer as well as to separate parts of a composite scatterer.

As before, the various references are classified into a set of narrower subject categories (Sections 2 and 3). The set of the subject categories is essentially the same as in [1,2]. However, there are a few original categories which are not populated since no relevant publications have appeared during the past two years.

As previously, we do not assess the validity and importance of the results described in the specific publications included in this database, which means that the inclusion of a publication does not constitute any formal endorsement or quality certification on our part. However, as a simple precautionary measure, we decided to include in the database only publications available in English. This excludes a few papers published in Russian and a substantial number of papers published in Chinese. We have a significant concern that some of the papers published in Chinese may contain no original material, but we are not in the business of trying to prove that. This explains the simple approach that we have adopted.

We plan to maintain an updated version of the combined database on the web site http://www.giss.nasa.gov/~crmim/ and ask the readers to keep helping us by sending corrections and missing references to existing and future publications on the *T*-matrix method and its various applications.

2. Particles in infinite homogeneous space

2.1. Books

Borghese et al. [3]