

Preface

The starting point of the conference series CoMFoS “Continuum Mechanics Focusing on Singularities” dates back twenty-one years ago, when a small workshop on mathematical fracture mechanics was organized in Ishikawa prefecture in Japan. The organizers of this workshop were researchers in both mathematics and engineering, who firmly believed the importance of mathematics in further development of engineering and industry, especially in the field of continuum mechanics. These organizers were Kohji Ohtsuka (Hiroshima Kokusai Gakuin University), Tetsuhiko Miyoshi (Yamaguchi University), and Chikayoshi Yatomi (Kanazawa University), who are considered the founding members of the series CoMFoS. Their activity continues today in the research activity group “Mathematical Aspects of Continuum Mechanics (MACM)”, which is part of the Japan Society for Industrial and Applied Mathematics (JSIAM).

One of the main examples of the importance of the conference series CoMFoS stems from the rapid growth of computers over the last two decades, which extremely enhanced the computer simulation techniques in engineering and industrial software packages. These techniques often lack a rigorous mathematical foundation, which lead to questionable consistency, accuracy, and efficiency. Improving such properties can only be done by combining the knowledge from researchers from industry, engineering, and mathematics, and that is exactly what the series CoMFoS intends to do.

The international conference CoMFoS16 “Mathematical Analysis of Continuum Mechanics and Industrial Applications II” was held at Kyushu University, Fukuoka, Japan, from October 22 to 24, 2016, which was supported and organized by Institute of Mathematics for Industry (IMI), Kyushu University, as part of the project “Workshop of the Joint Research Projects”, and was co-organized by MACM. It was the sequel of previous year’s CoMFoS15 as the 16th meeting of CoMFoS. It attracted a wide variety of researchers not only from mathematics and engineering but also from fields such as rheology, nano-science, material science, and seismology. It achieved a great success under the financial and operational supports of IMI, Kyushu University.

It is our great pleasure to present the proceeding of CoMFoS16 as part of the series of Mathematics for Industry, following up on the proceedings of CoMFoS15, which has recently been published in the same series. This book consists of fifteen peer-reviewed research papers and surveys, which are divided into the following six chapters: Fracture Mechanics, Shape Optimization, Modeling of Earthquakes, Material Structure, Interface Dynamics, and Complex Systems. The wide variety of the topics contained in this proceedings reflects the increasing presence and importance of the mathematical modeling and analysis in the present and future technologies and sciences.

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On behalf of the Organizing Committee of CoMFoS16

Mathematical Analysis of Continuum Mechanics and
Industrial Applications II

Proceedings of the International Conference CoMFoS16

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2018, VIII, 193 p. 44 illus., 25 illus. in color., Hardcover

ISBN: 978-981-10-6282-7