

ENGINEERING

This year's selected contributions could have appeared also in Sections of the MCFA *Annals* devoted to other scientific Panels. This reflects the often interdisciplinary nature of the topics that are tackled by engineers nowadays.

The first contribution is authored by Dr. Maurizio Brocchini from the University of Genova and is dealing with the modeling of the water motions at the shoreline; simply stated, exactly at the boundary separating the wet from the dry region of a beach. The aim of the study is to develop a better understanding for the dynamics inside the so-called *swash zone*. In the first part, the author is emphasizing the difference in the character of swash zone flows corresponding to non-breaking and to breaking waves and he commends on the modeling of these flows. Another matter that is discussed is the mechanism of generation of low frequency waves in the swash zone. Towards the end the author offers his views about future directions of research and on how certain limitations of the contemporary numerical approaches, e.g. the concerning the assumed boundary conditions and the reliance on the linear wave theory, could be overcome.

The second paper is authored by Dr. Hussain Saleh from l'Université Libre de Bruxelles and also by Dr. Peter Dare from the University of Brunswick, Canada. Their topic is the technology of global navigation satellite systems (GNSS) and the development of cost-effective positioning networks. GNSS have become recently indispensable for navigation and positioning but their increasing cost has become a matter of concern. The research that is reported here is about the application of operational research techniques for optimizing the design of positioning networks, taking into account geometrical as well as cost restrictions. The potential of two specific techniques is explored with satisfactory results: *simulated annealing* and *tabu search*. The authors believe that evolutionary techniques such as *genetic algorithms* or *ant colony optimization* could also prove beneficial for the further improvement of the performance of these systems.

Before closing I would like to thank all the MCFA Fellows who have submitted papers to the Engineering Panel for the second Volume of the *Annals*. Those who have not been successful this time are encouraged to try again next year; because in most cases the submitted papers were of a high standard and worthy of publication. My sincere thanks are also due for all the people who have acted as paper reviewers and have provided detailed technical reports despite the severe time limitations.

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