Special issue on Folds and Structures in International Journal of Space Structures

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Foreword

There is a close link between the action of folding and the design of structures. Folding is a fabrication process; folding generates new shapes; folding gives structural thickness to a surface. This link was identified for a while by architects, designers and engineers. However, recent advances in folding simulations and digital fabrication process offer new perspective for designing structures.

The present special issue on folds and structures contains 10 articles providing a rather broad picture of latest advances from several research teams.

The first article is a review of form-finding techniques with origami and applications to structures which shows that there are many unexplored geometries for designing structures. It is thus not surprising that several contributions investigates new patterns which presents kinematic or static interest. For instance, the egg-box pattern and Miura-ori are generalized in several ways and corresponding parametrization are provided in in articles 3, 4 and 7. Considering folded strips allows more freedom and simpler fabrication process. A review of these possibilities is provided in the last article (10).

Applications which are presented investigate folded structures from the scale of the fold itself to the challenging scale of a bridge. The medium scale applications presented in article 5 and 6 make use of wood panels and would not have been possible without digital cutting. This motivates the closer look at the mechanical assembling of these panels in three contributions from two different teams (articles 6, 8 and 9). Finally, a movable footbridge is investigated in article 2, showing that larger scale may be reached with folding concepts.

The rather wide range of emerging applications shows the versatility of folds and allows great expectations in this domain.

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