Book Review

“*Extreme Ocean Waves*”, edited by E. Pelinovsky and C. Kharif, second edition, Springer International Publishing, 2016; ISBN: 978-3-319-21574-7, ISBN (eBook): 978-3-319-21575-4

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The second edition of “*Extreme Ocean Waves*” published by Springer is an update of a collection of 12 papers edited by Efim Pelinovsky and Christian Kharif following the April 2007 meeting of the General Assembly of the European Geosciences Union. In this edition, three new papers have been added and three more have been substantially revised. Color figures are now included, which greatly aids in reading several of the papers, and is especially helpful in visualizing graphs as in the paper on symbolic computation of nonlinear wave resonance (Tobisch et al.). A note on terminology: extreme waves in this volume broadly encompass different types of waves, including deep-water and shallow-water rogue waves (which are alternatively termed freak waves), and internal waves. One new paper on tsunamis (Viroulet et al.) is now included in the second edition of this volume. Throughout the book, the reader will find a combination of laboratory, theoretical, and statistical/empirical treatment necessary for the complete examination of this subject. In the Introduction, the editors underscore the importance of studying extreme waves, documenting a dramatic instance of damaging extreme waves that recently occurred in 2014.

The three papers new to the second edition of “*Extreme Ocean Waves*” are related to wave run up. Didenkulova et al. investigate the runup of a range of waves characterized by a broad Gaussian spectrum. Importantly, the authors demonstrate that significant runup, a statistical measure akin to significant wave

height, is greater for broad-spectrum waves than it is for narrow-spectrum waves of equivalent incident wave height. Rodin et al. investigate the effects of ocean wave breaking during runup and indicate the conditions for bore formation. Tsunami waves generated by small Froude number cliff failures are examined in the new paper by Viroulet et al. Using a granular slide medium and multiphase physics, they importantly demonstrate that the amplitude of the generated waves depends on the difference between the avalanching angle and the angle of bathymetric slope.

The three papers that have been significantly revised in the second edition include the development of a compact equation to describe rogue waves by Dyachenko et al. as an approximation to the fully nonlinear system that describes modulation instability presented by Zakharov et al. in the first edition of “*Extreme Ocean Waves*”. Fernandez et al. investigate modulation instability by analyzing water-wave statistics from numerical simulations, laboratory experiments, and field data. Soomere updates the study of extreme and decadal variations in wave conditions to the entire Baltic Sea, using long-term time series.

As an update to the first edition, “*Extreme Ocean Waves*” again is a valuable contribution to the literature on wave theory and statistics, helping fill an important gap in our knowledge of a variety of unusual waves. It should be of great interest to scientists and engineers studying physical oceanography, wave dynamics and observations, nonlinear physics, and applied mathematics.

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