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宁波大学力学学术报告

Flutter and oscillatory instabilities in elastic structures

2023 年 12 月 4 日，星期一，下午 1:30 PM

龙赛理科楼南楼　519 会议室

报告题目： **Flutter and oscillatory instabilities in elastic structures**

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报告简介

Flutter instability caused by follower loads has become a reality after the invention of the "freely-rotating wheel device" by Bigoni and Noselli, of the "flutter machine", and of the device to generate Reut-type loads. Further research has proven that flutter instability, Hopf bifurcation, dissipation instabilities, and Ziegler paradox are all possible in conservative systems, thus disproving an erroneous belief continuing since at least 50 years. The last part of the talk addresses a new type of flutter instability generated by the "fusion" of two structures which are separately stable, but become unstable when joined together, Fig. 1. The analysis of instability involves here the treatment of a discontinuity in the curvature of a constraint.

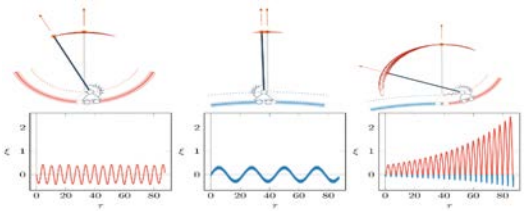

Figure 1: Two stable smooth subsystems with positive and negative curvature of a sliding constraint (left and centre) and the fusion of these two structures, namely, a compound non-smooth structure displaying instability (right), although the two 'components' are stable. The tensile force acting at the free end of the rods is tangentially follower and the same for all three structures, lying well below the critical load for instability in the case of the two smooth 'component systems'.

Prof. Davide Bigoni holds a full professor position at the University of Trento (Italy), where he is leading a very active group in the field of Solid ad Structural Mechanics. He has authored or co-authored more than 150 journal papers and has written a book published by Cambridge University Press. He was elected in 2009 Euromech Fellow (of the European Mechanics Society), received in 2012 the Ceramic Technology Transfer Day Award (of the ACIMAC and ISTEC-CNR), and in 2014 he was awarded the Doctor Honoris Causa degree at the Ovidius University of Constanta. He has received the Panetti and Ferrari Award for Applied Mechanics (from the Accademia delle Scienze di Torino), in 2018 he was Guest Lecturer for the Midwest Mechanics Seminars, in 2019 he was nominated Fellow of the Istituto Lombardo, Accademia di Scienze e Lettere, he was awarded a 60th Anniversary Issue of the Journal of the Mechanics and Physics of Solids. His research has been featured on 7 covers of International Journals. He has coordinated and has been involved in 3 European grants between academia and industry. He has been awarded 2 ERC advanced grants awarded by the European Research Council, the first in 2013 and the second in 2021. He is co-editor of the Journal of Mechanics of Materials and Structures, is associate Editor of Mechanics Research Communications and member of the editorial boards of: Archives of Mechanics, International Journal of Solids and Structures, Journal of Elasticity, Journal of the Mechanical Behavior of Materials, Acta Mechanica Sinica, and International Journal of Applied Mechanics. He is reviewer for more than 150 international journals. He was vice chair of the panel PE8 for the European Research Council Starting Grants.
More details can be found at *https://bigoni.dicam.unitn.it/*

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