SEMINAR 885

题 目： **A higher-order beam model for indentation problems**

报告人：茹重庆 教授 （University of Alberta）

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摘 要 It is known that the classical beam model fails for the indentation problem of an elastic beam by a rigid indenter. A refined higher-order beam model derived by the Kerr-type differential relation between normal pressure and the deflection of pressured surface is applied to develop a simple analytical model for the indentation of an elastic beam by a rigid circular cylinder. The proposed method is validated by comparing its predicted results with known data, and the merit of the present method is demonstrated by some new easy-to-use explicit formulas and new numerical results. In particular, the present model confirms that the contact zone becomes two separate strips when its width increases and exceeds a certain critical value. It is expected that this new higher-order beam model could be useful for some elastic beam problems for which the classical beam model fails.

Dr. Ru is currently a Professor in department of mechanical engineering, University of Alberta, Canada. Dr. Ru received his doctorate in solid mechanics at Peking University (China), and then worked in the Institute of Mechanics, Chinese Academy of Science and held a number of visitor/research positions in several universities in Italy, USA and Canada. He joined the University of Alberta in 1997 and became a Professor in 2004. Dr. Ru's past research areas include plastic buckling of structures, mechanics of elastic inclusions, electroelastic mechanics, and some applied mathematics problems related to solid mechanics. Besides traditional areas of solid mechanics, his recent research interests include solid mechanics at micro/nano scales, solid mechanics of soft matter, and solid mechanics of thin film materials.

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