

# NED UNIVERSITY JOURNAL OF RESEARCH STRUCTURAL MECHANICS

## SQUARE OF THE DIRAC'S DELTA DISTRIBUTION A NEW DEFINITION FOR ENGINEERING MECHANICS

Author(s): **Abdolrasoul Ranjbaran**

Volume: **XI**

No: **1**

Pages: **21-27**

Date: **January 2014**

### **Abstract:**

The analysis of cracked members is a paramount research interest in Civil, Mechanical and Aerospace engineering. The Dirac's delta distribution and its square are used for modelling the crack and deriving the governing equations. The square is defined as a constant times delta. The accurate definition of the multiplying coefficient is an open question in the literature. The free vibration analysis of cracked members is done by the Ranjbaran transformation and the stiffness reduction methods. The first is based on the Dirac's delta and the latter on the delta squared. The results of the two are set equal to each other. The equivalency of the results of two methods is beneficially used and a new, innovative, and accurate definition for the square of Dirac's delta is proposed. The proposed definition provides an answer of the problem, at least in engineering mechanics applications.

### **For full paper, contact:**

**Prof Muhammad Masood Rafi**

Editor-in-Chief, NED University Journal of Research

Ph: +92 (21) 99261261-8 Ext: 2413; Fax: +92 (21) 99261255

Email: [NED-Journal@neduet.edu.pk](mailto:NED-Journal@neduet.edu.pk)

Website: <http://www.neduet.edu.pk/NED-Journal>

