



MAT-1

Tensile Properties of Fiber Reinforced Laminate with Ply Splice

Han Wu, Bin Ma, Dingding Chen *College of Basic Education, National University of Defense Technology, China,*
18874985105@163.com, 739524201@qq.com, dingding.mail@163.com

*Supervisor: Dingding Chen*¹, lecturer Kazuo Arakawa², professor Shiyi Jiang³ Yueyao Shen⁴ *1*
College of Basic Education, National University of Defense Technology, China,
dingding.mail@163.com *2* *Research Institute for Applied Mechanics, Kyushu University, Japan,*
k.arakaw@riam.kyushu-u.ac.jp *3* *Interdisciplinary Graduate School of Engineering Science,*
Kyushu University, Japan,
yiyueyaoshen@yahoo.co.jp *4* *NISSAN SHATAI CO.,LTD., Japan,*
jiannshiyi@yahoo.co.jp

Due to high strength and low density, fiber reinforced plastics (FRP) have been used widely, and FRP structures with large size are required by more and more applications. When the FRP structure becomes large, only one reinforcement ply may not large enough. In this case, it is required to splice two or more plies to meet the size requirement. However, the ply splice structure will play like a defect in a FRP structure and decrease the mechanical property. In order to use the FRP product with ply splice structures safely, it is necessary to master its mechanical properties. In this paper, tensile properties of five kinds of ply splice structures are studied through experiments. FEM method using ABAQUS is adopted to analyse the stress situation of the ply splice structures under tensile loadings, expecting to find out the key factors leading to the failure of the structures. The results show, inducing ply splice into CFRP materials, the tensile strength decreases evidently. Due to the ply splice, stress concentration occurs, and the tensile stress component in through-thickness direction seems the key factor leading to the failure.