

Fatigue Delamination Propagation in Composite Laminates: Mode II and Mixed Mode

Dreszer Fracture Mechanics Laboratory—Professor Banks-Sills

banks@tau.ac.il

Wanted: Ph.D. or M.Sc. student-full time

Prediction of fatigue delamination propagation in composite laminates is an important requirement for structures found in aerospace, marine, automotive, medical equipment and sport equipment industries. These composites are characterized by high ratios of toughness to weight and strength to weight, which allow them to tolerate defects, thus enabling longer life cycles and lower fuel consumption of such structures.

In this investigation, two carbon/epoxy material systems will be studied. Mode II (shear) and mixed mode (tension and shear) tests will be carried out. Beam type specimens are chosen for testing: calibrated end loaded split (C-ELS) and mixed mode end loaded split (MMELS) in Figs. 1a and 1b, respectively. Other specimens may be considered. Several quasi-static tests will be carried out for comparison to previous tests. The main objective is to characterize the fatigue delamination propagation behavior through fatigue loading. Calculations will be made by means of the finite element method using post-processors which have already been developed. Imaging techniques will be required including possibly digital image correlation (DIC).

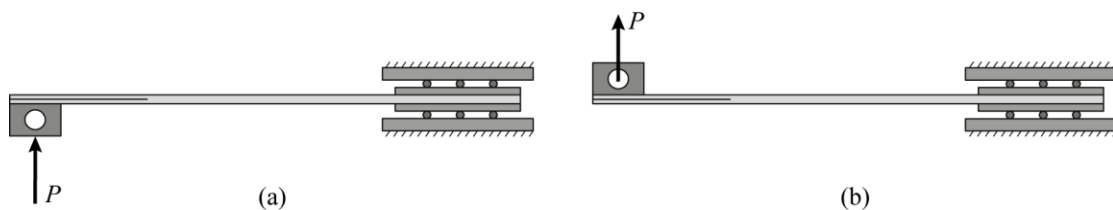


Fig. 1 (a) C-ELS and (b) MMELS specimens.