

INTERLAMINAR STRESSES AND DELAMINATION  
AROUND HOLES IN COMPOSITE LAMINATES.

H.D. Goonetilleke  
*Open University, Nawala.*

It is generally accepted that the presence of high interlaminar stresses at the free edges of a composite laminate leads to delamination along ply interfaces. Though there are many analytical solutions for the case of a straight free edge, analytical solutions for interlaminar stresses at hole boundaries are rare and limited, because of the greater complexity associated with the geometry.

In the present work, a simple approximate technique to determine the sign and relative magnitude of interlaminar shear stresses  $\tau_{xz}$  and  $\tau_{yz}$ , around a hole in a laminate subjected to uniaxial tension has been presented. The interlaminar shear stresses are estimated at all the interfaces on a circular free-edge for a number of different laminates. The results are compared with numerical results from the literature, with good agreement of the shape and sign of the distributions, both around the hole and through the thickness. The distribution of these interlaminar stresses as a function of angle around the hole is compared with experimental observations of delamination. The results are encouraging and demonstrate the possibility of employing relatively simple approximate stress solutions in delamination prediction.