

**“Finite Element Analysis of Diffuse Axonal Injury,”** in *Vehicle Crashworthiness and Occupant Protection in Frontal Collisions*, Society of Automotive Engineers, pp. 141-154, February 1990 (with T. A. Khatua, R. L. Piziali, and S. Rifai).

**Abstract.** Several research efforts have been dedicated to the study of diffuse axonal injury (DAI) using simplified analytical models, surrogate material physical models and animal experiments. The present study makes use of the finite element method to refine the analytical and physical models to study DAI using a two-dimensional coronal brain section. The finite element model is first verified by comparison with documented physical model experiments, then used to study the effects of (inertial) loading magnitude and duration on the levels of shear strain (which produce DAI). The effects of brain size are also addressed and comparison is made with Holbourn's scaling relationship. It is observed that the brain/skull interface as well as the geometry and compartmentalization of the brain have considerable influence on the brain response to inertial loading.