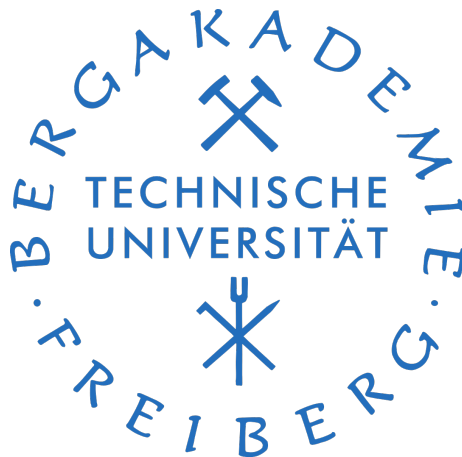


Development and implementation of material subroutine for fibre reinforced plastics in a commercial FEM software

Master thesis

Winter semester 2018/19



Presented by: Arun prakash Ganapathy

Supervised by: Dr.-Ing Dominik Laveuve

Mat.Nr: 63876

E-mail: arun-prakash.ganapathy@student.tu-freiberg.de

1 Introduction

1.1 Background and motivation

Composite materials are made of two or more dissimilar materials of different physical or chemical properties when combined, create a material with properties unlike the individual constituent materials. The earliest use of composite materials date back to 3400 B.C when Mesopotamians glued wood strips at different angles to create plywood. Another notable example is the bow made by Mongols during 1200 A.D, which is made from a combination of bamboo, wood, cattle tendons and silk bonded with natural resin. In the early, 1900s bakelite based composites were developed for its non-conductivity and heat resistant properties and widely used in industrial and consumer applications. Now a days advanced composite materials are widely used in structural design in various industries such as aerospace, automobile, marine, petrochemical etc., due to their superior properties over traditional engineering materials.