

Si-Infiltrated SiC Lattices in Elevated Temperatures: A Thermo-Mechanical Analysis

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Abstract

Si-infiltrated SiC porous composites exist in different forms composed of cores of cellular ceramic and skin plates of ceramic matrix composites. Due to high thermal conductivity, low coefficient of thermal expansion, high elastic modulus and high strength, the final product can be a promising candidate for applications in temperatures up to 1500 K such heat exchangers, recuperators and solar receivers.

A thermo-mechanical analysis is required for most of these applications to analyze the effect of thermal shock and thermally induced stresses on the structure. A direct numerical approach to this problem is impossible due to complexity of geometry. This work aims in developing proper model with COMSOL Multiphysics® software.