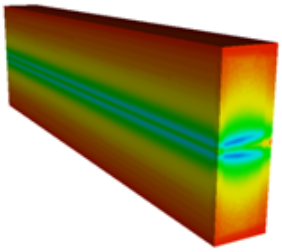

Contribution ID: **36** Type: **not specified**

Carbon-metal composites for thermal management

Tuesday 4 September 2007 11:25 (20 minutes)

Carbon-metal matrix composites are a very attractive materials for thermal applications, given their very high thermal conductivity in at least two planes.
Therefore, in an attempt to obtain a good thermal conducting material as well as a low Coefficient of Thermal Expansion (CTE), a mixture of reinforcements (graphite and carbon fibre) was infiltrated with liquid alloys. The role of two reinforcing materials are following: while graphite reinforcement increases thermal conductivity in the plane direction, the carbon fibre helps to reduce the CTE of the alloy in the same direction. In the present work, graphite-carbon fibre preforms were infiltrated with Al/Si and Ag/Si alloys by means of gas pressure to produce an anisotropic composite.
The influence of the volume fraction in the thermal conductivity and CTE was evaluated. The experiments determined that the manufactured composites has a adequate thermal behaviour to be used as low cost materials in heat spreaders.
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Session Classification: Session 2: New Ideas / New Materials

Track Classification: Carbon-metal composites for thermal management