Use of acoustic emission and electrical resistivity to detect damage in ceramic matrix composites

Morscher, Gregory, gm33@uakron.edu, University of Akron

ABSTRACT

Ceramic matrix composites (CMCs) are soon to be used in hot section components of commercial jet engines because of their excellent high temperature thermo-mechanical properties. However, ultimate life of these types of continuous fiber reinforced composites is controlled by the onset and growth of damage in the form of matrix cracks. Waveform-based acoustic emission and more recently the change in electrical resistance with damage have been used in order to characterize, quantify, and monitor matrix cracking with great success. An overview of these techniques and how they have been applied to SiC-based CMCs will be presented as well as future improvements and directions being pursued for these health-monitoring approaches.