**[Stress analysis on the reinforcement particles of the metal matrix composite by Raman spectroscopy](https://www.scopus.com/record/display.uri?eid=2-s2.0-85045692936&origin=resultslist&sort=plf-f&src=s&nlo=1&nlr=20&nls=afprfnm-t&affilName=universiti+malaysia+pahang&sid=1bc8dc7b2388d6dcfc929e48e1c005db&sot=afnl&sdt=cl&cluster=scopubyr%2c%222018%22%2ct&sl=46&s=%28AF-ID%28%22Universiti+Malaysia+Pahang%22+60090654%29%29&relpos=639&citeCnt=0&searchTerm=" \o "Show document details)**

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**ABSTRACT**

In this research, the stress state of the reinforcing SiC particles in a hybrid MMC is investigated by micro Raman spectroscopy. The experiment was carried out *in situ* in the Raman spectroscopy. Experimental results show that cracks due to monotonic loading propagates by the debonding of the particle/matrix interface and particle fracture. Moreover, secondary cracks form in front of the main crack tip coalesce with the main crack in subsequent loading and final failure occurs. A high decrease in stress (several hundred in MPa) is observed with the interfacial debonding at the interface and with the particle fracture on the particle. The critical tensile stresses for particle-matrix interface debonding and particle fracture develop in hybrid MMC are also estimated during the crack propagation.

**KEYWORDS:**

Crack propagation; Cracks; Debonding; Fracture; Raman spectroscopy