论文

点群6一维六方准晶狭长体中有限长Griffith裂纹的反平面问题

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Anti-plane Analysis of a Finite Long Griffith Crack in a Point Group 6 of One-dimensional Hexagonal Quasicrystals Strip

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摘要 利用复变函数法,通过构造新的保角变换,研究了裂纹面受剪切作用下点群6一维六方准晶狭长体中有限长Griffith裂纹的断裂行为,得到了裂纹尖端处应力强度因子的解析解.当狭长体高度趋于无穷时,该解析解退化为无限大点群6一维六方准晶中有限长Griffith裂纹问题的解.

关键词： 点群6一维六方准晶狭长体   有限长Griffith裂纹   保角变换   应力强度因子   解析解

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Abstract： As one kind of complex variable function method to solve the plane problem in fracture mechanics, conformal transformation method is very practical and effective, which transforms the area in physical plane to the unit circle inside (outside) or the upper half-plane (lower half-plane) in mathematical plane by a conformal transformation. In this article, by using the complex variable function method and proposing a new conformal mapping, the fracture problem of a finite Griffith crack in a point group 6 of one-dimensional hexagonal quasicrystals strip is studied under anti-plane shear stress load in the crack surface. The analytic solution of the stress intensity factors at the crack tip is obtained. When the height of the strip tends to infinite, the present results can be degenerated to the solutions of a Griffith crack in infinite point group 6 of one-dimensional hexagonal quasicrystals.

Key words： point group 6 of one-dimensional hexagonal quasicrystals strip   finite Griffith crack   conformal mapping   stress intensity factor   analytical solution

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