

عنوان مقاله:

Progressive Damage in Adhesive Layer in a Composite-Patched Metallic Plate with Inclined Crack Subjected to Fatigue Loading

محل انتشار:

هشتمین کنفرانس ملی پژوهشهای کاربردی در مهندسی برق، مکانیک و مکاترونیک (سال: 1403)

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نویسنده:

Javad Eidan - Department of Civil and Environmental Engineering, Amir Kabir University of Technology, Tehran, Iran

خلاصه مقاله:

Extended Finite element method (XFEM) and Cohesive Zone Method (CZM) were used to analyze the progressive damage in the adhesive layer of an aluminum plate with initial inclined crack that is strengthened using an adhesively bonded composite patch, in order to increase its fatigue life. The progressive damage of the adhesive that results in debonding of the patch from the strengthened plate was modeled using a user-defined subroutine in Abaqus. The results were compared with that's obtained from models that do not include damage in the adhesive layer. It was concluded that the damage in this layer is dependent on the material properties of the adhesive and patch lay-up sequence. Besides, neglecting the damage in adhesive layer can lead to an overestimated fatigue life for the patched plate, up to ۲۳ percent.

کلمات کلیدی:

crack, damage, FRP, CZM, XFEM

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