

# Dynamic plastic response of clamped stiffened plates with large deflection<sup>(PDF)</sup>

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Title: Dynamic plastic response of clamped stiffened plates with large deflection

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摘要: Study on the dynamic response, and especially the nonlinear dynamic response of stiffened plates is complicated by their discontinuity and inhomogeneity. The finite element method (FEM) and the finite strip method are usually adopted in their analysis. Although many useful conclusions have been obtained, the computational cost is enormous. Based on some assumptions, the dynamic plastic response of damped stiffened plates with large deflections was theoretically investigated herein by a singly symmetric beam model. Firstly, the deflection conditions that a plastic string must satisfy were obtained by the linearized moment-axial force interaction curve for singly symmetric cross sections and the associated plastic flow rule. Secondly, the possible motion mechanisms of the beam under different load intensity were analysed in detail. For structures with plastic deformations, a simplified method was then given that the arbitrary impact load can be replaced equivalently by a rectangular pulse. Finally, to confirm the validity of the proposed method, the dynamic plastic response of a one-way stiffened plate with four fully clamped edges was calculated. The theoretical results were in good agreement with those of FEM. It indicates that the present calculation model is easy and feasible, and the equivalent substitution of load almost has no influence on the final deflection.

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备注/Memo: -

