عنوان مقاله:

Calculation of APMS and STHT Responses in Three Translational Axis Vibration for Human Body Using Biomechanical Modeling and Matrix Method

محل انتشار:

مجله پیشرفت تحقیقات محاسباتی در علوم و مهندسی کاربردی, دوره ۲, شماره ۴ (سال: ۱۳۹۵)

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خلاصه مقاله:

Nowadays, need to simple biomechanical models which have a good agreement with experimental results to evaluate vibration biodynamic responses, the feeling are more significant. Also, seat-to-head transmissibility (STHT) and apparent mass (APMS) are biomechanical measure that has been widely used for many decades to investigate seat dynamics and human body response to vibration. For this purpose, in this manuscript, a novel biomechanical model of a seated human body (SHB) with vertical backrest exposed to whole body vibration in the horizontal (x), vertical (z) and lateral (y) directions is developed. The model is based on two types of biodynamic functions: STHTand APMS. The proposed model is a new type of model called the matrix model, on which the stiffness and damping matrices are employed instead of the spring and damper scalar parameters to evaluate x-y-z-vibrations in three directions. Matrix model as a novel method with many benefits over prior methods including simplicity, fewer degrees of freedom and high accuracy. In this study, biodynamic responses consist of APMS and STHT in x-y-z directions are extracted by using genetic algorithms. The obtained result are shown which, the presented model with ۱۵-DoF had an excellent agreement with experimental data

کلمات کلیدی:

Automotive passenger, Biomechanical, Human body, Whole body vibration