

## **The method of reverberation-ray matrix and its application in structural dynamics**

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### **Summary**

Accurate prediction of structural behavior of engineering structures subjected to various loads, at best directly from exact solutions of continuum models of structural members, is always a concern of significance to scientists and engineers. The method of reverberation-ray matrix, which was newly developed by Pao et al. based on continuous waveguide models, is found to bear the potential to be an efficient and accurate tool for free vibration and transient dynamic analysis of framed structures. The method is reformulated in this paper for a general space frame with either rigid and/or hinged joints. Appropriate transform matrices are introduced to facilitate the derivation of two fundamental relations, i.e. the scattering relations and the phase relations. Extensive discussion on joint conditions is presented to account for effects such as spring-support, prescribed joint motion, semi-rigidity, and even the attachment of tuned- mass-damper. Emphasis on future research is also given.

