

Response of a Bridge Crane during an Earthquake

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Abstract : During an earthquake, a bridge crane may be subjected to multiple impacts between crane wheels and rail. In order to model such phenomena, a time-history dynamic analysis with a multi-scale approach is performed. The high frequency aspect of the impacts between wheels and rails is taken into account by a Lagrange explicit event-capturing algorithm based on a velocity-impulse formulation to resolve contacts and impacts. An implicit temporal scheme is used for the rest of the structure. The numerical coupling between the implicit and the explicit schemes is achieved with a heterogeneous asynchronous time-integrator.

Keywords : bridge crane, earthquake, dynamic analysis, explicit, implicit, impact

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