

## **Design and Optimization of Inerter Layouts for a Multi-Layers Building Model**

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### **Abstract**

The paper applies inerters to a five-layer building model, and discusses the benefits of different inerter layouts. First, we construct a five-layers building model, and verify the model by two methods. Second, we consider four suspension layouts for the building model, including the spring-damper, the parallel inerter, the serial inerter, and the mechatronic inerter. We use the historical Kobe earthquake data to discuss the improvement of suspension performance. The results shows that inerters can significantly improve suspension performance of building systems, especially using the mechatronic networks, which has the potential of adjusting parameters for different earthquakes.