

## Fractional Calculus into Structural Dynamics

**Authors :** Jorge Lopez

**Abstract :** In this work, we introduce fractional calculus in order to study the dynamics of a damped multistory building with some symmetry. Initially we make a review of the dynamics of a free and damped multistory building. Then we introduce those concepts of fractional calculus that will be involved in our study. It has been noticed that fractional calculus provides models with less parameters than those based on classical calculus. In particular, a damped classical oscillator is more naturally described by using fractional derivatives. Accordingly, we model our multistory building as a set of coupled fractional oscillators and compare its dynamics with the results coming from traditional methods.

**Keywords :** coupled oscillators, fractional calculus, fractional oscillator, structural dynamics

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