**Seismic Behavior of Reinforced Concrete Shear Wall Dominant Buildings**  
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The fundamental period of vibration plays a major role in predicting the expected behavior of structures under dynamic excitations and it has also been traditionally used to estimate the equivalent lateral seismic design force according to building design codes and recommendations. In current seismic code provisions (e.g. EN 1998-1), seismic forces estimation using design spectra, requires either implicitly the use of empirical equations for the fundamental period determination or more specifically detailed dynamic analysis. The empirical-based expressions for evaluating the period of vibration of RC Shear Wall (SW) buildings are illustrated. In order to evaluate the dynamic properties of RC Shear Wall buildings, defined by means of a simulated design procedure, a parametric study was carried out by varying geometric parameters (number of storeys, plan dimensions, bay length) and percentage of shear walls. A description of the considered database of RC SW structure models, along with the periods calculated in both directions were provided. The periods obtained from eigenvalue analysis were then compared with the periods obtained using building codes. The differences between the periods of the models and the corresponding periods obtained using building codes indicate that the expressions in building codes can further be improved. A practical approach was carried out and implied experimental measurements using ambiental vibrations of real buildings in order to identify their fundamental vibration periods. A database of measured periods of RC buildings was also provided and compared with the expressions given in seismic codes. In order to improve the expression for fundamental period, certain metaheuristic optimization methods were implemented.