

Multiaxial Interaction Domains of R.C. sections derived through a parametric subdomains discretization

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ABSTRACT

The paper concerns the analysis of reinforced concrete sections of arbitrary shape under axial load and biaxial bending moments. Equilibrium and compatibility equations are recalled and put in an effective and general matrix form. The kernel of the problem is the integration of the terms of the stiffness matrix of the section. The integration is carried out by subdividing the section into parametric subdomains and by using Gauss integration rules. In particular it is shown how, through a double transformation, a more refined discretization of circular and hollow circular sections is possible. Many comparative examples are presented and, in particular, it is also shown how the widely used fiber method is a particular case of the present more general approach. In the end, a rational way to determine the frontier of the interaction domain and characteristic applications are shown.

The sectional discretization proposed is also of great relevance as an intermediate tool for integrating the element stiffness matrix in a general finite element code for the analysis of R.C. framed structures.

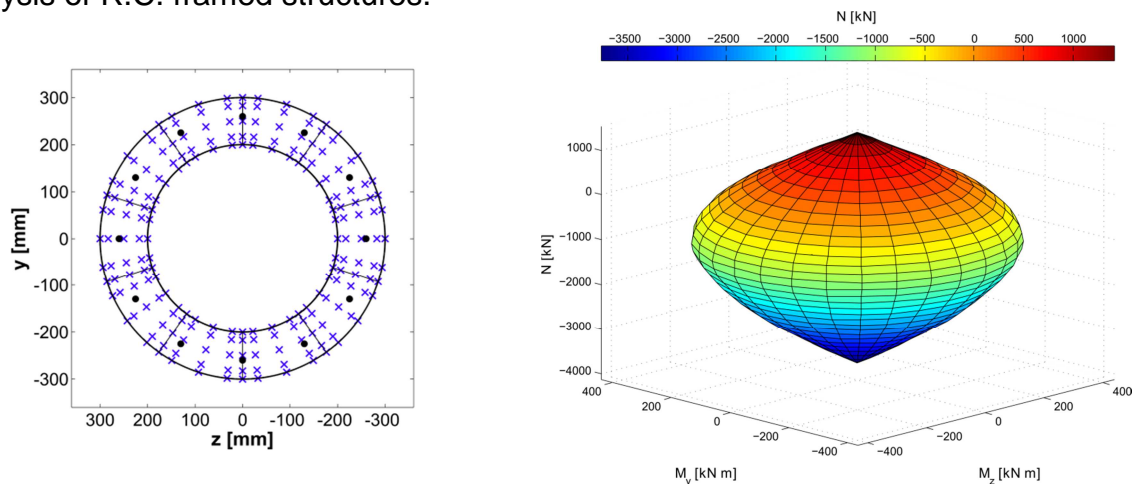


Fig.1 Sectional discretization strategy and 3D Interaction Domain

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