

5<sup>th</sup> International Conference on

# STEEL AND CONCRETE STRUCTURES

August 29-30, 2018 Tokyo, Japan

## Influence of concrete confinement on axial load capacity of circular concrete-filled double-skin steel tubular short columns

**N Uma Maheswari**

SRM Institute of Science and Technology, India

Double-skin steel tubes filled with concrete in between are considered as the extended version of concrete-filled steel tubes. These columns are preferable since they possess better structural properties such as strength and stiffness, fire resistance and cyclic performance compared to conventional reinforced cement concrete or steel columns. Concrete-Filled Double-Skin Steel Tubular (CFDST) columns consist of two concentrically placed steel tubes, an outer and an inner, with concrete sandwiched between them and a hollow space at their center. It is observed from earlier researches that the parameters influencing behavior of CFDST columns are length to diameter ratio, diameter to thickness ratio/thickness of outer and inner steel tubes, concrete and steel strengths. The significant aspects related to the performance of composite columns are the interaction between steel tube and concrete and confinement effect and these aspects need to be analyzed in short composite columns. This paper deals with the analysis of results obtained from finite element analysis carried over by the author, on axial load carrying capacity of circular CFDST short columns. The evaluation of concrete confinement effect on axial load capacity of CFDST short columns is performed with respect to current international standards such as Eurocode 4 and AISC. Furthermore, the influence of geometric and material properties of CFDST short columns on the confinement effect and hence on axial load carrying capacity is discussed. The results obtained from experiments conducted by previous researchers, as available in literature are also included. The results show that diameter-to-thickness ratio of steel tubes and concrete compressive strength has significant influence.

umamaheswari.n@ktr.srmuniv.ac.in