

[1]徐蕾,孙战伟,王文达.内配圆钢管的SRC轴心受压短柱的力学性能[J].自然灾害学报,2013,03:205-212.

XU Lei,SUN Zhanwei,WANG Wenda.Mechanical behavior of axial compression steel reinforced concrete stub with inner circular steel tube[J].,2013,03:205-212.

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内配圆钢管的SRC轴心受压短柱的力学性能

《自然灾害学报》 [ISSN:/CN:23-1324/X] 期数: 2013年03期 页码: 205-212 栏目: 出版日期: 2013-07-30

Title: Mechanical behavior of axial compression steel reinforced concrete stub with inner circular steel tube

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关键词: [内配圆钢管的SRC柱](#); [轴心受压](#); [力学性能](#); [数值模拟](#); [参数分析](#)

Keywords: [steel reinforced concrete \(SRC\) column with inner circular steel tube](#); [axial compression](#); [mechanical behavior](#); [numerical simulation](#); [parametric study](#)

分类号: TU398

DOI: -

文献标识码: -

摘要: 在合理选取钢材和混凝土本构模型的基础上,利用ABAQUS软件建立了内配圆钢管的SRC轴压短柱力学性能分析模型,对其在轴压荷载下的荷载-变形关系全过程曲线、典型破坏形态、荷载分配及承载力进行了较全面的分析.结果表明:钢管外箍筋约束混凝土和钢管约束核心混凝土在轴压荷载作用下最先进入塑性阶段,接着钢管外箍筋约束混凝土达到极限承载能力,外围钢筋混凝土相对内部钢管混凝土承担更多的荷载.钢管内混凝土强度、钢管外混凝土强度、钢管屈服强度、截面含钢管率、纵筋配筋率、体积配箍率和位置系数是影响内配圆钢管的SRC轴压短柱承载力的主要因素.分析结果可为相关工程应用提供参考.

Abstract: With proper selection of constitutive models of steel and

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concrete, an analytical model of the mechanical behavior of axial compression steel reinforced concrete (SRC) stub column with inner circular steel tube was established in ABAQUS in this paper. The entire process of axial load versus deformation relationships, typical failure pattern, load distribution and bearing capacity of the columns were comprehensively analyzed. Results show that the outer concrete confined by stirrups and concrete confined by circular steel tube reach their plastic stage first, then the stress of outer concrete confined by stirrups reaches its ultimate value, and the concrete confined by stirrups bears much more load than the concrete confined by circular steel tube. Main factors which affect the bearing capacity of this type of