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拉─扭复合加载下不锈钢的弹塑性本构关系─I．实验

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摘要　讨论了１Ｃｒ１８Ｎｉ９Ｔｉ不锈钢薄壁圆管试件沿三段折线、不同曲率的圆形和椭圆应变路径承受拉－扭复合载荷的实验．在塑性应变空间中，观察加载路径的内蕴几何参数对应力矢量大小、方向影响的规律．结果表明：响应的延迟角、瞬时软化和重新强化性质与路径的内蕴几何学密切相关；Ｌｅｎｓｋｙ的“局部确定性”假设不完全符合事实；变形历史和应变分量相互间的耦合效应对响应存在显著的影响．初步的电镜实验表明，材料中的位错组态和塑性应变历史密切相关

关键词　拉－扭复合加载　延迟角　位错

分类号

AN ELASTO PLASTIC CONSTITUTIVE EQUATIONS FOR THE STAINLESS STEEL UNDER COMBINED AXIAL AND TORSIONAL LOADS PART I. EXPERIMENTS

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Abstract

In the present paper, a series of experiments were performed on the plastic deformation of a thin walled tubular specimen of 1Cr18Ni9Ti S.S. along trilinear, circular and elliptical strain paths under combined loads of axial force and torque. The effects of intrinsic geometry of loading path on the magnitude and the direction of stress vector were investigated in plastic strain vectoral space. Experimental results show that the delay,the instantaneous softening and the recovery of hardening of stress respo...

Key words　combined axial torsional loading　delay angle　dislocation

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