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# 动力学总势能不变值原理在质点系建模中的应用

李东平, 曾庆元

(中南大学土木建筑学院,湖南长沙,410075)

摘　要：根据虚位移概念和达朗贝尔-拉格朗日原理分析了虚位移过程中作用在质点系上的所有主动力和惯性力都不改变,可视为有势力,导出了质点系动力学总势能不变值原理.该原理是达朗贝尔-拉格朗日原理的延伸和发展,它具有以下特点:将矢量动力学和分析动力学有机结合;不需区分有势力和非有势力;有简洁、统一的表达形式;可简便建立复杂质点系的动力学方程等.此外,通过算例证明了该原理的正确性和有效性.

关键字：质点系;动力学总势能不变值原理;达朗贝尔-拉格朗日原理;建模

# The principle of total potential energy with stationary value in system of particles and its application

**LI Dong-ping, ZENG Qing-yuan**

（College of Civil Architectural Engineering, Central South University, Changsha 410075, China）

**Abstract:**This paper discusses that the principal force and inertial force in a system of particles are not changed in the course of virtual displacement from the concept of virtual displacement. The principle is derived from dynamical total potential energy with stationary value in system of particles from d′Alembert-Lagrange principle. This principle is the development of d′Alembert-Lagrange principle, it combines analytical dynamics with vectorial dynamics organically. It doesn′t distinguish between potential force and non-potential force, and has a pithy and unified style. It is a simple and convenient method of establishing dynamical equations of complex system.

**Key words:**system of particles; principle of total potential energy with stationary value; d′Alembert-Lagrange principle; modeling

地 址：湖南省长沙市中南大学 邮编： 410083
电 话： 0731-88879765 传真： 0731-88877727
电子邮箱： zngdxb@mail.csu.edu.cn 湘ICP备09001153号