云南大学学报(自然科学版)
JOURNAL OF YUNNAN UNIVERSITY(NATURAL SCIENCES)
中文核心期刊
中国科技核心期刊

云南大学学报(自然科学版) » 2004, Vol. » Issue (5): 406-412 DOI:

曲率张量,规范场的实质 :梯度的旋度场

柳长茂

西南交通大学应用数学系, 四川, 成都, 610031

Curvature tensors,gauge field are actually curl field of gradient

LIU Chang-mao

Department of Applied Mathematics, Southwest Jiaotong University, Chengdu 610031, China

- 摘要
- 参考文献
- 相关文章

全文: PDF (1328 KB) HTML (KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 在黎曼空间、纤维丛空间(规范场)中,坚持使用遂点标架的基础上,普遍地引入绝对积分的概念(绝对微分逆运算),并对通常外微分$d(dx^i)\neq 0$的意义和条件加以讨论,改写微分形为对称形式,使外微分和绝对微分联系起来.在此基础上,改进Stokes’公式,引入环量、旋度、散度(通常借助或类比欧氏空间的概念来,不精确,不能很好应用).证实:曲率它正是非欧氏空间不为零的梯度的旋度.并发现:Bianchi等式实质是div(rot(grad))=0,曲率形成管形场,沿管不变.附带,得到挠率也是旋度.

关键词: Riemann-空间 规范场 绝对积分 旋度 曲率

Abstract: It is introduced the concept of absolute integral in Riemannian spaces and in fibre bundle space (Gauge field),with respect to frames at every point.This is just the inverse of the absolute differential. After discussing the exterior differential $d(dx^i)\neq 0$,rewrote the exterior differential form into symmetric form and established the relation between the exterior differential form and the absolute differential.By the aid of the absolute integral,it is improved Stokes’ formula:The strict definitions of the circulation,the curl and the divergence were obtained (usually,they were obtained only by analogy in Euclid-space,unable to apply here).It had been proved that the curvature tensor is a curl(grad),not zero except in Eucldean space,and so discovered the essence of Bianchi identity:div(rot(grad))=0,the curvature,forming tube field,is invariant along the tube,i.e.pointed out that Gauge fields are curl fields of gradients and so on.By the way,it is obtained the torsion tensor is rot of base of frame also.

Key words: riemannian space gauge field absolute integral curvature tensor curl

收稿日期: 2003-12-11;

基金资助:This research is supported by the National Natural Science Foundation of China(10301026).

服务
- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- E-mail Alert
- RSS

作者相关文章
- 柳长茂

引用本文:

柳长茂. 曲率张量,规范场的实质 :梯度的旋度场[J]. 云南大学学报(自然科学版), 2004, (5): 406-412.

LIU Chang-mao. Curvature tensors,gauge field are actually curl field of gradient[J]. , 2004, (5): 406-412.

没有本文参考文献

没有找到本文相关文献

编辑出版：云南大学学报编辑部 (昆明市翠湖北路2号, 650091)
电话：0871-5033829(传真) 5031498 5031662 E-mail: yndxxb@ynu.edu.cn yndxxb@163.com