

技术及应用

# CARR中子残余应力谱仪的设计与应用

李峻宏; 高建波; 李际周; 韩松柏; 祖勇; 刘荣灯; 刘晓龙; 刘蕴韬; 陈东风\*

中国原子能科学研究院 核物理研究所, 北京102413

收稿日期 修回日期 网络版发布日期:

**摘要** 中国先进研究堆(CARR)旁的中子残余应力谱仪是我国第1台利用中子衍射方法测量残余应力的设备。它的样品台及部分附属设备从瑞典引进, 结合CARR的实际情况, 完成了概念设计、物理设计及机械加工, 目前谱仪正在调试中。新的单色器屏蔽体起飞角在41°~109°连续可变, 采用五维姿态调整台, 方便灵活地调整单色器的位置。使用双聚焦Si(311)单色器, 谱仪的分辨可以达到0.2%。一维中子位置灵敏探测器ORDELA 1128N的主要指标与REST上使用的ORDELA 1150N的相比有了很大改进。谱仪的附属设备多样, 具备开展织构测量和材料原位拉伸等实验研究的能力。

**关键词** [中子衍射](#) [残余应力谱仪](#) [双聚焦硅单色器](#) [中子位置灵敏探测器](#)

分类号

## Design and Application of Neutron Residual Stress Diffractometer for China Advanced Research Reactor

LI Jun-hong; GAO Jian-bo; LI Ji-zhou; HAN Song-bai; ZU Yong; LIU Rong-deng; LIU Xiao-long; LIU Yun-tao; CHEN Dong-feng\*

China Institute of Atomic Energy, P. O. Box 275-30, Beijing 102413, China

**Abstract** The neutron residual stress diffractometer for China Advanced Research Reactor (CARR) is the first instrument in China for the residual stress measurement using neutron diffraction method. Its sample table and some affiliated equipments were relocated from Sweden. According to the situation of CARR, the conceptional and physical design and mechanism fabrication were finished. Now the whole instrument is going to be put in commissioning. The take-off angle of new monochromator's shielding could be continuously changeable from 41° to 109°. The position of monochromator could be adjusted conveniently and flexibly by a five axis table. The resolution of this diffractometer could reach 0.2% using the double focusing Si(311) monochromator. The technical specification of one dimension neutron position sensitive detector ORDELA 1128N is better than that of ORDELA 1150N used on REST. The various affiliated equipments of instrument enable the diffractometer to measure the texture and tensional experiment in situ.

**Key words** [neutron diffraction](#) [residual stress diffractometer](#) [double focusing Si monochromator](#) [neutron position sensitive detector](#)

DOI

通讯作者

| 扩展功能                                 |  |
|--------------------------------------|--|
| 本文信息                                 |  |
| ▶ <a href="#">Supporting info</a>    |  |
| ▶ <a href="#">[PDF全文](1340KB)</a>    |  |
| ▶ <a href="#">[HTML全文](0KB)</a>      |  |
| ▶ <a href="#">参考文献</a>               |  |
| 服务与反馈                                |  |
| ▶ <a href="#">把本文推荐给朋友</a>           |  |
| ▶ <a href="#">文章反馈</a>               |  |
| ▶ <a href="#">浏览反馈信息</a>             |  |
| 相关信息                                 |  |
| ▶ <a href="#">本刊中 包含“中子衍射”的 相关文章</a> |  |
| ▶ 本文作者相关文章                           |  |
| · <a href="#">李峻宏</a>                |  |
| · <a href="#">高建波</a>                |  |
| · <a href="#">李际周</a>                |  |
| · <a href="#">韩松柏</a>                |  |
| · <a href="#">祖勇</a>                 |  |
| · <a href="#">刘荣灯</a>                |  |
| · <a href="#">刘晓龙</a>                |  |
| · <a href="#">刘蕴韬</a>                |  |
| · <a href="#">陈东风</a>                |  |