

技术及应用

X射线法ICF靶丸几何参数批处理及壁厚分布计算

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摘要 分析了靶丸微焦X射线成像的基本原理, 采用改进Hough变换对靶丸X射线数字图像进行自动圆参数检测, 结合最小二乘圆拟合算法获得了精确的多层靶丸几何参数, 给出了靶丸图像批处理的整个分析流程, 并开发了一套完整的靶丸X射线图像批处理计算软件。在此基础上讨论了靶丸壁厚分布的批处理计算问题, 给出了多层靶丸壁厚分布状态及单层靶丸全表面壁厚分布情况的计算示例。

关键词 [ICF靶丸](#) [几何参数测量](#) [X射线图像批处理](#) [Hough变换](#) [壁厚分布](#)

分类号

Batch Processing of Geometric Parameters and Wall Thickness Distribution Calculation of ICF Capsule by X-ray Imaging Method

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Abstract The basic principle of micro-focus X-ray imaging was analyzed. An improved Hough transform method was applied to automatically detect circle parameters of the capsule X-ray digital image, and precise multi-layer capsule geometric parameters were obtained by combining the least squares circle fitting algorithm. The whole image analysis procedure of batch processing was also introduced and a complete capsule X-ray image batch computing software was developed. The wall thickness distribution of the capsule batch calculation was discussed based on the above work. Some examples of the wall thickness distribution of a multi-layer capsule and the whole surface distribution of a monolayer capsule were calculated. This work will contribute to the rapid automatic capsule geometry measurement, and provide more detailed capsule geometry parameters to meet the growing requirements of target fabrication tasks.

Key words [ICF capsule](#) [geometric parameters](#) [measurement](#) [batch processing](#) [of X-ray image](#) [Hough transform](#) [wall thickness](#) [distribution](#)

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