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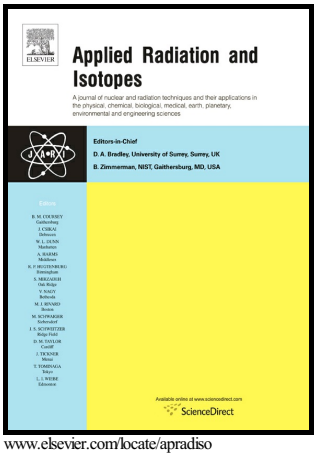

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A new method for removing false peaks to obtain a precise X-ray spectrum

Lin Tang[a,b], JieYu[a,]*,JianbinZhou[a], Fang Fang[a],WenjieWan[a], JianfengYao[a], SongkeYu[a,b], XianliLiao[a,b]

[a] *College of nuclear technology and automation engineering, Chengdu University of Technology, No.1 East 3 road, ErXianbrige, chenghua District, 610059 Chengdu, China*

[b]*School of Information Science and Engineering, Chengdu University,No.1 Shiling street, Longquanyi District, 610106Chengdu, China*

*Corresponding author: Email address: yjcdut@163.com

Abstract： To get a precise X-ray energy spectrum from the latest high-performance silicon drift detector (fast SDD),a switch reset preamplifier circuit, which has a high signal to noise ratio and small ballistic loss, is used to amplify the weak signal transmitted by the detector. Aiming at the technical problem of fast SDD, which works at high-count rate conditions, we adopt a slow triangle shaping method and use switch reset type preamplifier, and a new method is put forward to remove the false peaks to obtain a precise X-ray spectrum, in essence, to eliminate the distorted pulses transmitted by the detector.[55]Fe standard source and a certain kind of rock sample are regarded as measuring objects in the experiments. The spectral comparison figure, which contains the two measurement results of the pre and post elimination of the false peaks, respectively, shows that this method removes the false peaks located in the front of the full-energy peak in spectra and improves the peak-to-background ratio in a complex spectral analysis and the analytical precision of weak signals.

Keywords: Fast SDD, Switch reset preamplifier, Falsepeak elimination, Triangular shaping

1. Introduction

With the development of high-performance semiconductor X-ray detectors, great progress has been achieved in energy-dispersive X-ray fluorescence (EDXRF) spectrometry. It is widely used for its specific advantages such as fast measurement, high precision, and nondestructive