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A new collimated multichannel modular detection system based on Silicon Drift Detectors

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After the manufacture and delivery of a state-of-the-art detection system for the XRF-XAFS beamline of the synchrotron light source SESAME, a new and improved detection system was realized. This new multichannel modular detection system based on Silicon Drift Detectors consists of 8 monolithic multipixel arrays, each comprising 8 (SDD) cells with a total area of 570 mm^2. As the previous one, this 64 channels integrated detection system includes ultra-low noise front-end electronics, dedicated acquisition system, digital filtering, temperature control and stabilization. With respect to the SESAME version, the new instrument implements a collimation system yielding a total collimated sensitive area of 499 mm^2. Optimized to work in an energy range of 3-30 keV, the system shows an overall energy resolution (sum of its 64 cells) below 170 eV FWHM at the Mn 5.9 Ka line at room temperature. We highlight the system performance, and in particular the peak to background ratio, before and after the collimation of the sensors.

Collaboration

ReDSoX Collaboration

Primary author: CIRRINCIONE, Daniela (Istituto Nazionale di Fisica Nucleare)

Co-authors: ANTONELLI, Matias (Istituto Nazionale di Fisica Nucleare); AQUILANTI, Giuliana (Elettra Sincrotrone Trieste); BELLUTTI, Pierluigi (FBK-TIFPA); BERTUCCIO, Giuseppe (MI); BORGHI, Giacomo (Fondazione Bruno Kessler - TIFPA); CAUTERO, Giuseppe (Sincrotrone Elettra Trieste); FICORELLA, Francesco (FBK-Trento); GANDOLA, Massimo (FBK-Trento); GIURESSI, Dario (Elettra Sincrotrone Trieste); MELE, Filippo (Istituto Nazionale di Fisica Nucleare); MENK, Ralf Hendrik (Elettra Sincrotrone Trieste); OLIVI, Luca; ORZAN, Giulio (TS); PEPPONI, Giancarlo (FBK-Trento); PICCIOTTO, Antonino (Istituto Nazionale di Fisica Nucleare); RACHEVSKI, Alexandre (Istituto Nazionale di Fisica Nucleare); RASHEVSKAYA, Irina (Istituto Nazionale di Fisica Nucleare); STEBEL, Luigi (Elettra Sincrotrone Trieste); ZAMPA, Gianluigi (Istituto Nazionale di Fisica Nucleare); ZAMPA, Nicola (Istituto Nazionale di Fisica Nucleare); ZORZI, Nicola (TIFP); VACCHI, Andrea (Istituto Nazionale di Fisica Nucleare)

Presenter: CIRRINCIONE, Daniela (Istituto Nazionale di Fisica Nucleare)

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