

Contact X-ray microscopy and micro-radiography on lithium fluoride detectors

Salvatore Almaviva^{a)}, Giuseppe Baldacchini^{a)}, Carlo Bellecci^{d)}, Francesca Bonfigli^{a)}, A. Cricenti^{b)}, Anatoly Faenov^{c)}, Francesco Flora^{a)}, Massimo Francucci^{d)}, Pasqualino Gaudio^{d)}, Antonella Lai^{a)}, Tiziana Marolo^{a)}, Sergio Martellucci^{d)}, Luca Mezi^{a)}, Rosa Maria Montereali^{a)}, Tatiana Pikuz^{c)}, Armando Reale^{e)}, Lucia Reale^{e)}, Maria Richetta^{d)}, Antonio Ritucci^{e)}, Alexander Rydzy^{d)}, Giuseppe Tomassetti^{e)}, Alessandro Ustione^{b)}, Maria Aurora Vincenti^{f)}.

a) ENEA, Centro Ricerche Frascati, Via E. Fermi 45, 00044 Frascati, Italy.

b) CNR, Istituto di Struttura della Materia,, Via Fosso del Cavaliere 100, 00133 Rome, Italy.

c) MISDC of VNIIFTRI Mendeleevo, Moscow region, 141570, Russia

d) Università di Tor Vergata, Dip. Di Ingegneria, Via Del Politecnico 1, 00133 Roma, Italy.

e) Università dell'Aquila e INFN, Physics Dept., Coppito, 67010 L'Aquila, Italy.

f) ENEA, Centro Ricerche Casaccia, Via Anguillarese 301, 00060 S. Maria di Galeria, Rome, Italy.

The lack of a good detector for Contact X-ray Microscopy (CXRM) has limited up to now the performances of this simple and cheap microscopy technique. In this contribution, a new detector based on Lithium Fluoride (LiF) crystals or films is proposed. Experimental results demonstrating the high spatial resolution (sub 100 nm) and the high dynamic range achievable on a LiF detector will be presented. Also for applications on contact micro-radiography of biological samples, where generally photographic films or CCD cameras are widely used, this novel image detector presents interesting potential applications due to its higher resolution. A comparison between a LiF detector and other image detectors will be discussed. Finally, preliminary experimental results of CXRM of some biological specimen (leptolyngbya, etc.) imaged on LiF will be shown.