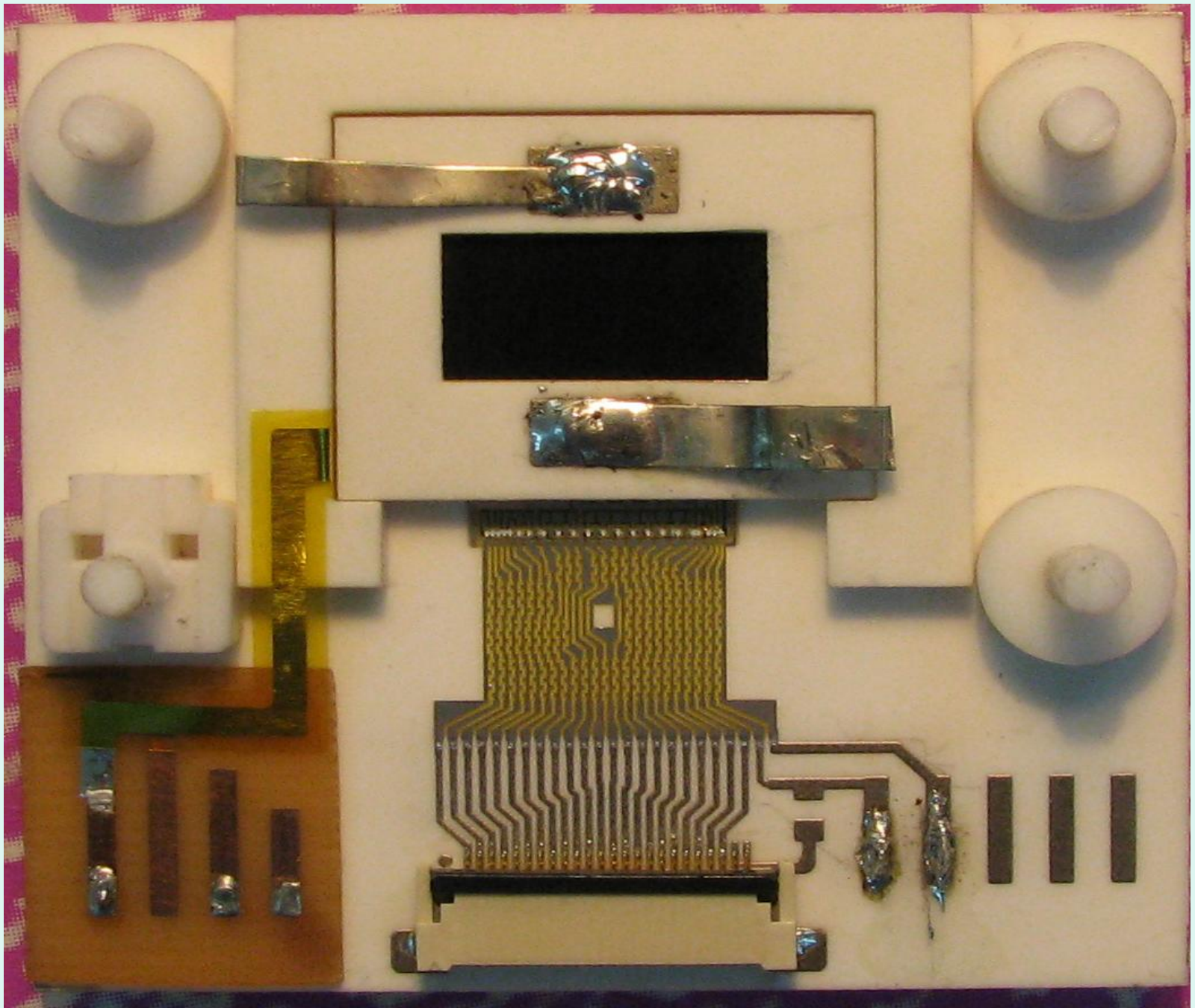


Coordinate-sensitive microelectronic detector

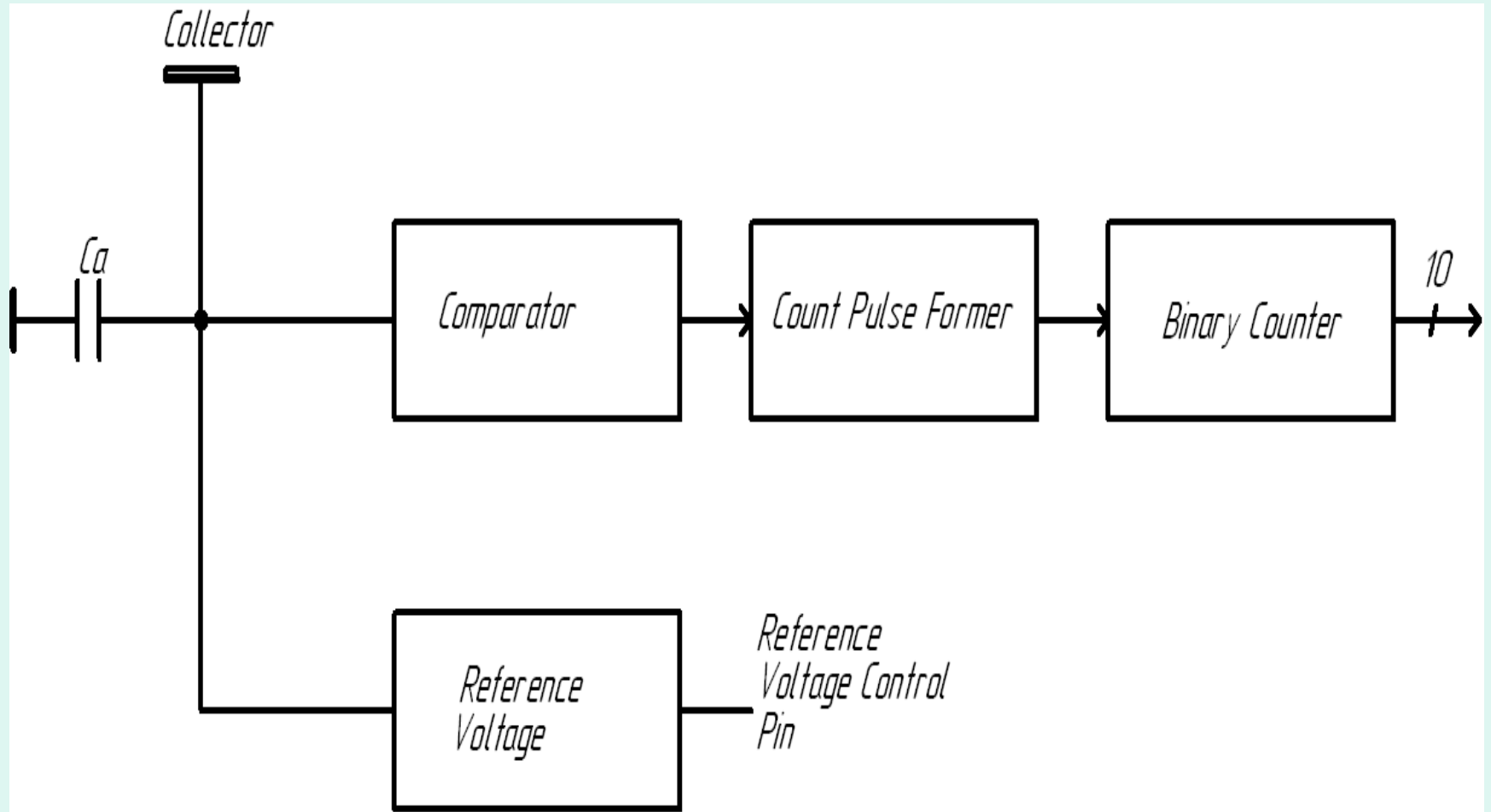
Dmitry Nagorny

Institute of Applied Physics NAS
of Ukraine

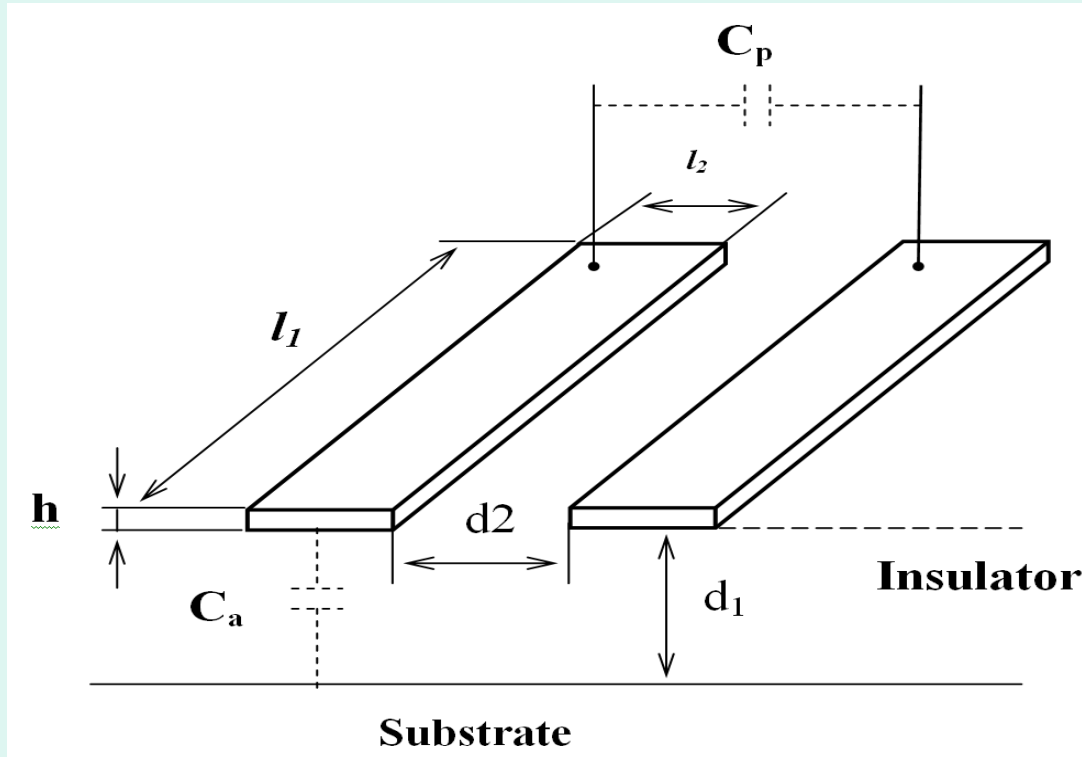
Sumy, 2013



Charge to Digital Converter



Geometry of collecting electrodes



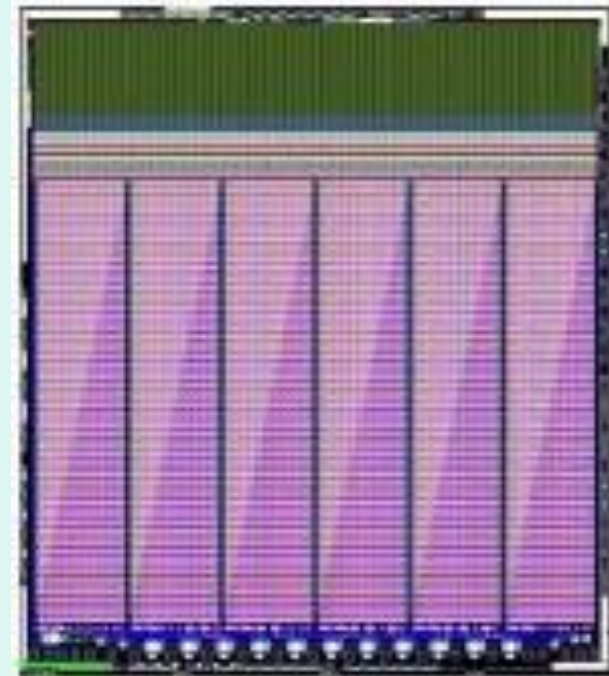
$$C_a = \frac{l_1 \cdot l_2}{d_1},$$

$$C_p = \frac{l_1 \cdot h}{d_2},$$

$$\frac{C_p}{C_a} = \frac{d_1 \cdot h}{d_2 \cdot l_2}$$

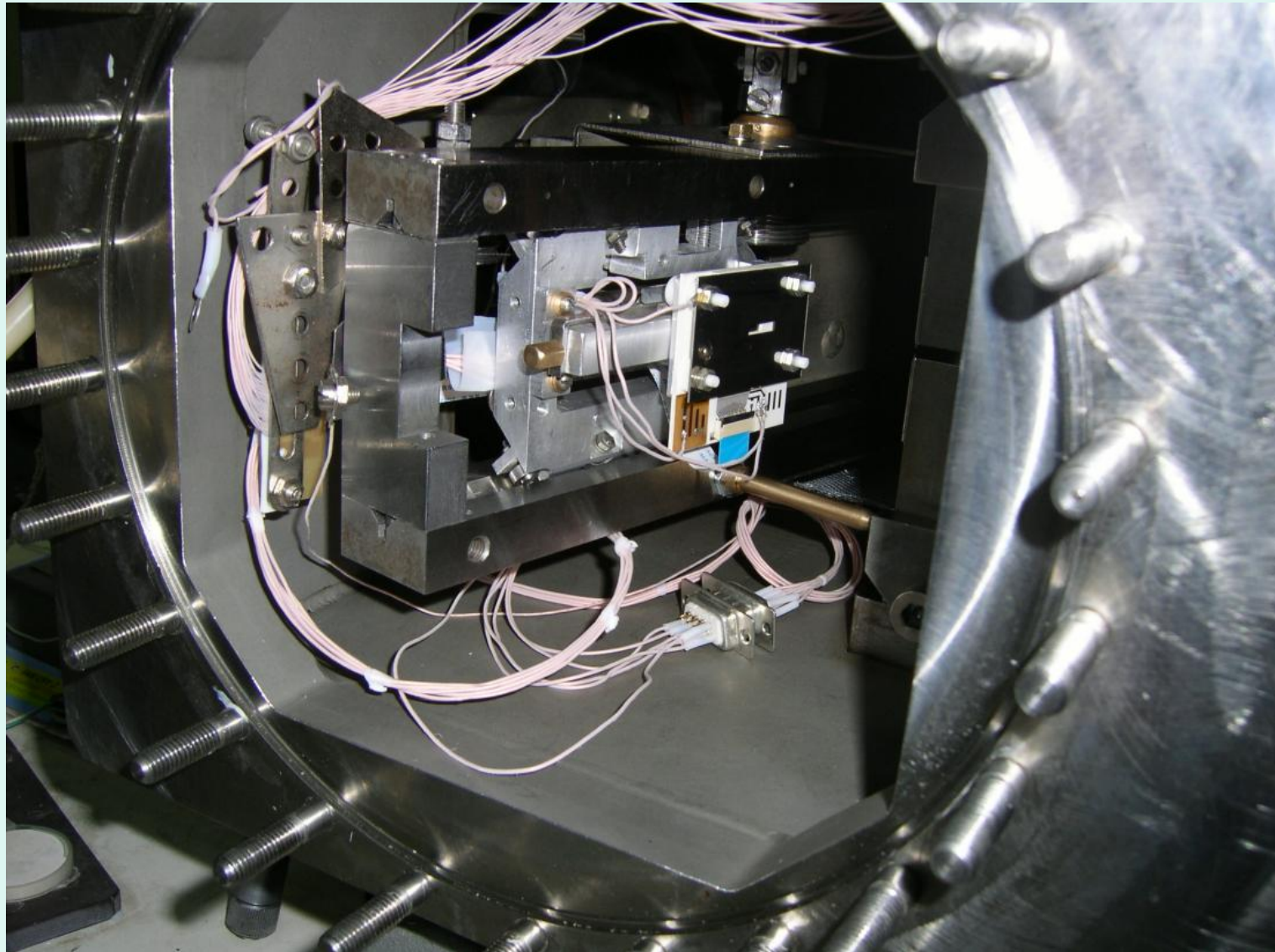
Detector Scheme Composition and Basic Parameters

Collecting Electrodes 1-384					
Charge to Digit Converters					
Binary Counter 321-384	Binary Counter 257-320	Binary Counter 193-256	Binary Counter 129-192	Binary Counter 65-128	Binary Counter 1-64
Control Logic and IO Buffers					

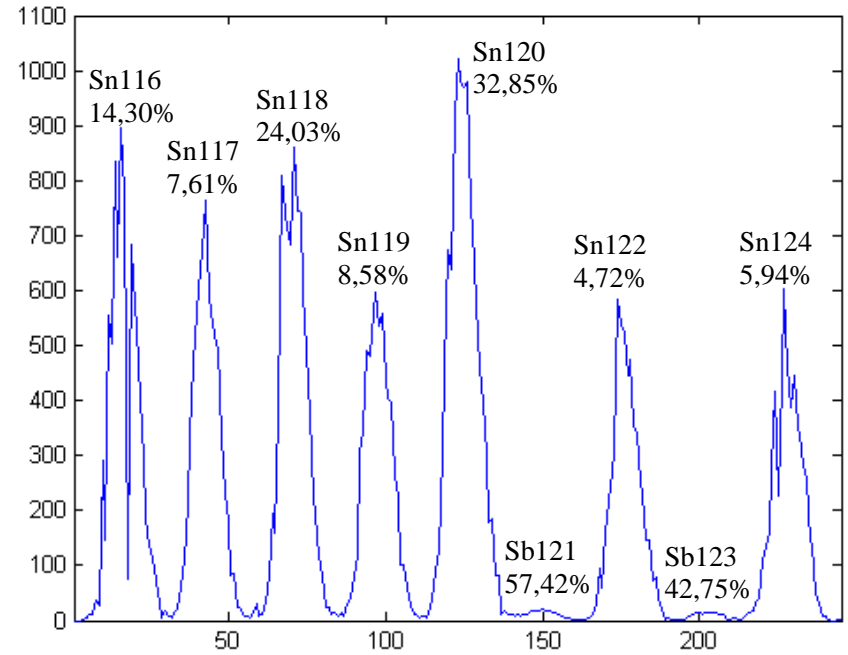
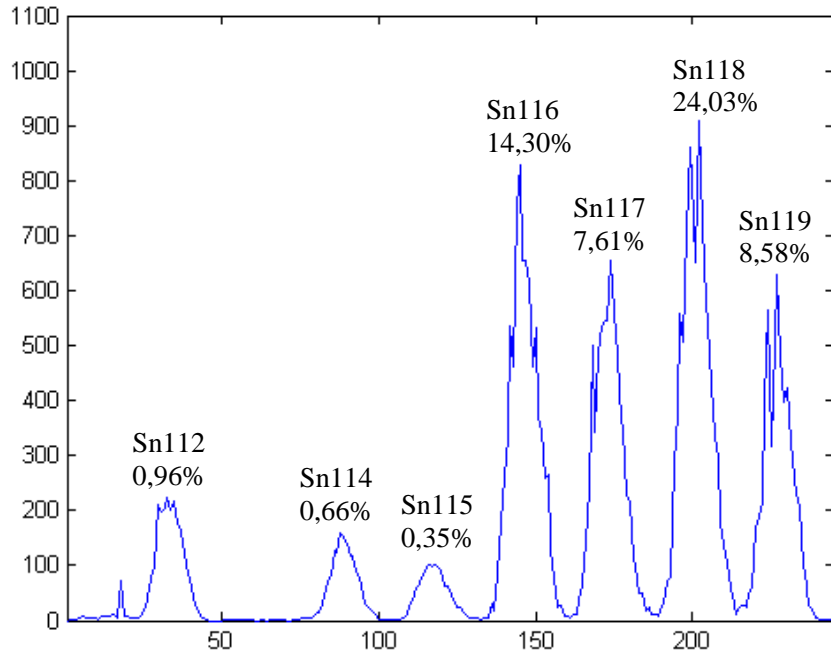


Integral scheme technology: CMOS	Transistors number -142322
Physical size of IC crystal: 10.05x10.2mm	Measurement channels number - 384
Sensitivity for each measurement channel: 10^6	Current consumption (5V@3MHz): 7 mA
Charge to digit converter resolution: 10 bits	Size of collecting electrode: 2mm x 18mkm
Maximum frequency of impulse count: 10 MHz	Collecting electrodes pitch: 25mkm
Operating pressure range: Atm - 10 ⁶ Pa	Peripheral interface: parallel-serial compatible with TTL levels

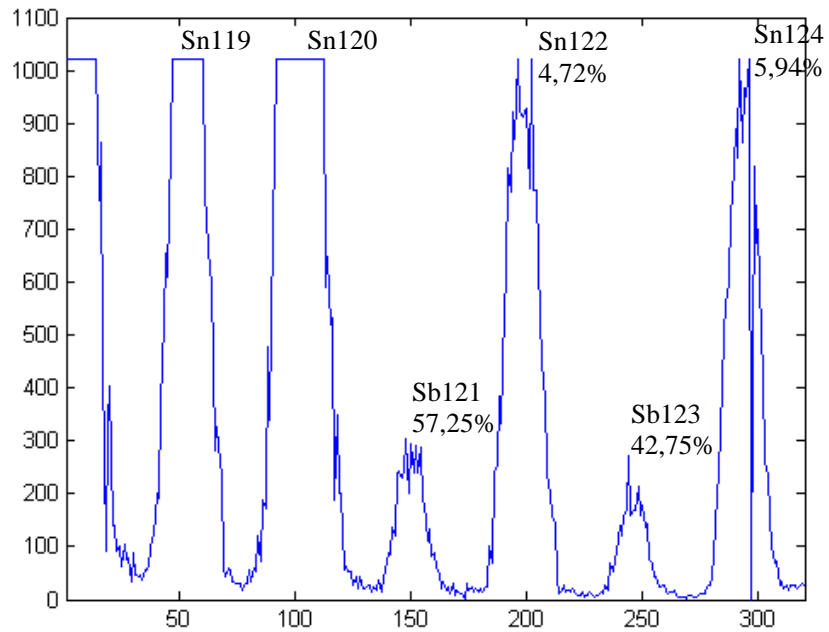
Model of Anodes Lattice



Mass Spectra of Tin Isotopes



Mass Spectra of Tin Isotopes



Bronze M662	
Element	% weight
P	0,021
Fe	0,021
Cu	87.53
Zn	4,93
Sn	3,05
Sb	0,0028
Pb	4,4