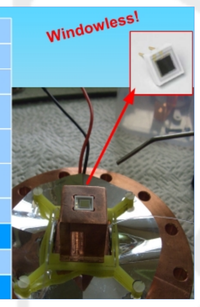
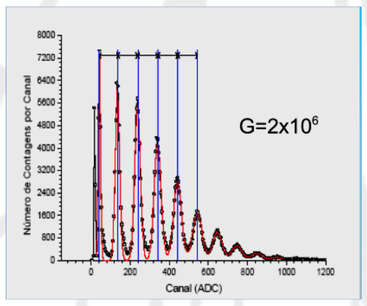
Detectores de Radiação – Passos Recentes

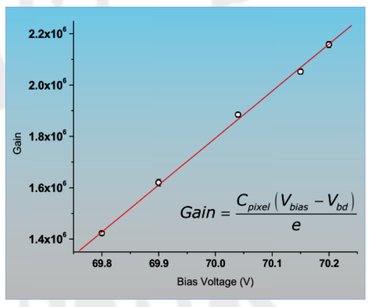
Fotomultiplicadores de Silício para detectores de Xénon

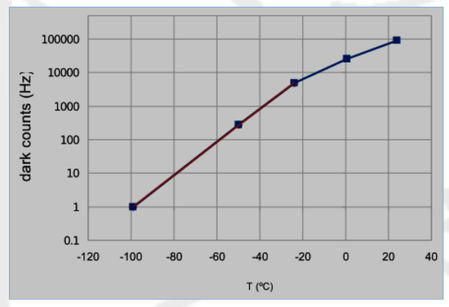
- Objectivo: substituir os volumosos PMTs nas experiências de matéria escura em que eles são a principal contribuição de fundo.
- Nos *Silicon Photo-Multipliers* –matrizes de foto-díodos de avalanche (píxeis) que operam independentemente no modo Geiger –o sinal gerado é a soma de todos os píxeis.

Type	S10362-33-100X	
Number of pixels	30x30	
Effective active area	3x3 mm	
Fill factor	78.5 %	
Peak sensitivity	440 nm	
Spectral response range	320-900 nm	
Dark counts	room	~2 MHz
	-35 °C	12.7 KHz
Time resolution (1 pe)	0.6 ns (FWHM)	
Gain	2 x 10^6	





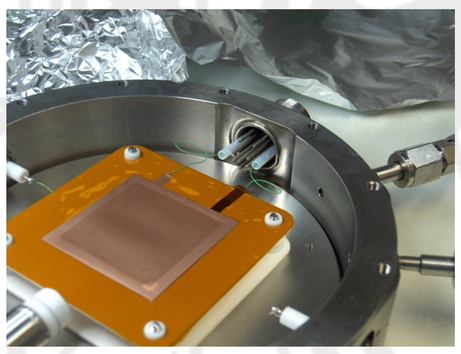


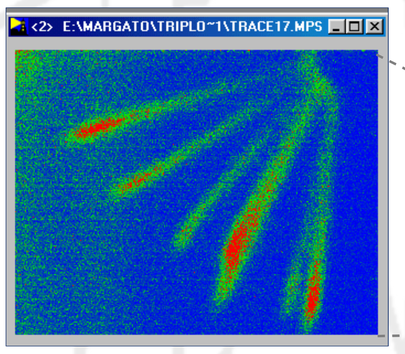


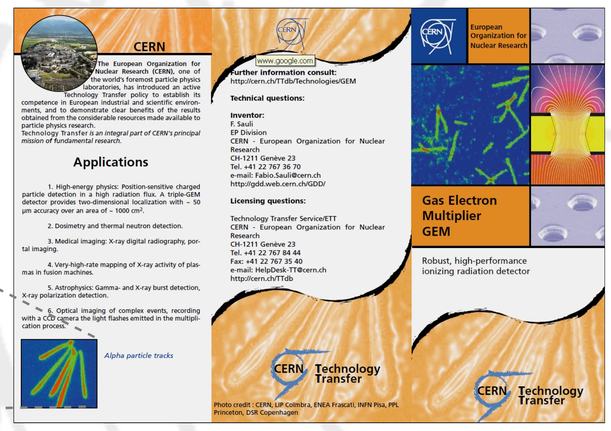
Positivo: ganho ~10^6; *dark counts* ~1 Hz (à temperatura do Xe líquido)
Negativo: eficiência quântica ainda baixa (~3%)

Câmara Anger gasosa para imagiologia de neutrões térmicos

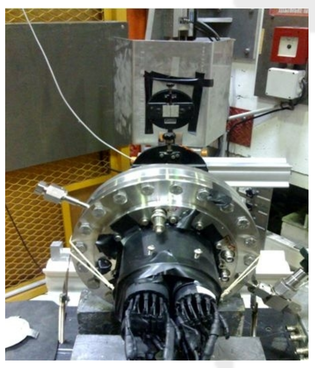
Projecto FP7 226507 - NMI3, JRA, WP22

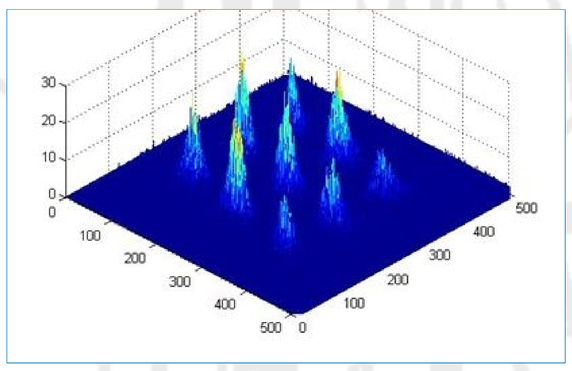


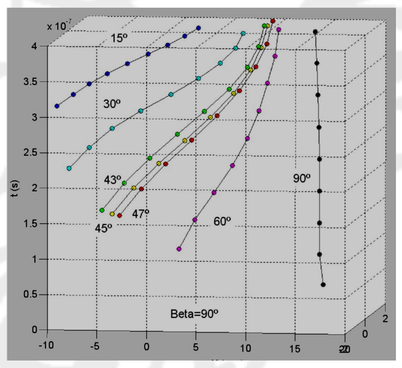




Cintilação em microestuturas do tipo GEM: imagens de dE/dx de partículas alfa obtidas no LIP com uma câmara CCD surgiram no CERN Courier e no folheto de transferência tecnológica sobre GEMs. O conceito evoluiu depois para a TPC óptica com leitura por fotomultiplicadores, já testada com sucesso no ILL e adoptada pelo Projecto NMI3.

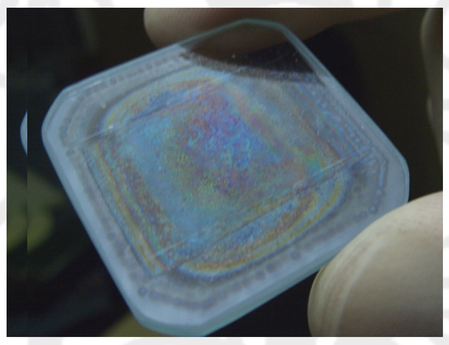


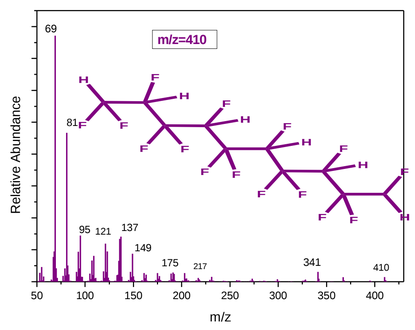


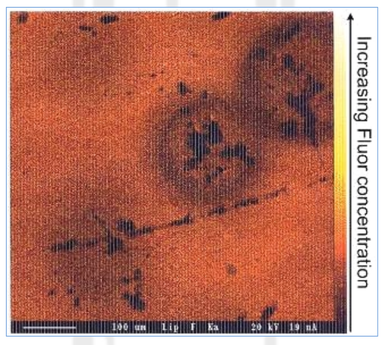


Química do envelhecimento de Câmaras de Placas Resistivas

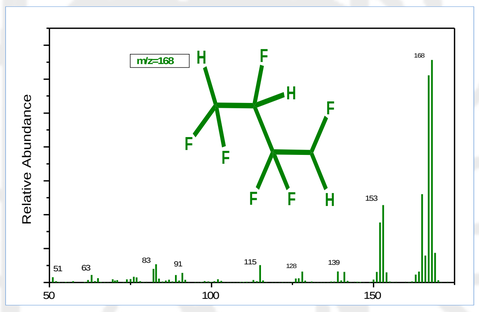
(Colaboração RD51 – CERN; com DEM e DQ da FCTUC)

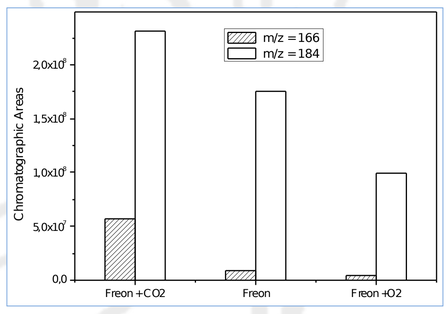






Concentration (a. u.)	O	F	Si	S	Na	Al	Fe	Ca	Mg
New glass face 1	547	0	87	0	20	10	0	1	5
New glass face 2	540	0	93	0	18				
cathode back face	555	0	83	0	3	6			
cathode	1050	380	110	0	200	30	10	40	20
anode	712	1200	140	0	120	45	27	45	30





- Análise da composição atómica dos depósitos;
- Identificação dos oligómeros de tetrafluoretano responsáveis pelos depósitos;
- Identificação de um gás inibidor da polimerização.

Laboratório de Instrumentação e Física Experimental de Partículas

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