

xenon detector

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RED-1 detector



Electron extraction efficiency

Only part of ionization electrons is extracted into the gas gap!

What happens to the rest of electrons and how do they affect operation of a detector?



Dedicated scientific run dataset

Waveforms recorded:

~268 ms with 2 ns sampling,

~4.2 ms with 4 ns sampling and gain 10 times lower

Trigger: muon event

"Accompanying" signals

New kind of signals following after big S2 was observed



Characteristics:

1) atypical durations

2) time interval between S2 and S3: $[0;190] \mu s$

Reconstruction of S3 positions (simple centroid method)



S3 signals: distance-time correlations



S3 signals: duration-time correlations



Interpretation



SE signals



Reconstruction of spatio-temporal image of events



SE emission rate dependence on time



Conclusion

Results

- 1) Ionization signals of a new kind (S3) were observed
- 2) Rate-time dependence for spontaneous SE emission was obtained
- 3) Reconstruction of spatio-temporal image of events

Thank you for your attention!



РОССИЙСКИЙ ЭМИССИОННЫЙ ДЕТЕКТОР

Backup1: tilt of the detector



Backup 2: ¹³⁷Cs events coordinates, simple centroid



Backup 3: S3/S2 light yield



Backup 4: extraction yield



Backup 5: SE emission after S3



Backup 6: Muon signal, electron emission and S3



Backup 7: Chi-square calculation for the sample of data

Event ID	Number of small intervals (points)	$\chi^2/\text{d.o.f.}$
7	10	2.7
9	9	1.8
16	6	0.52
18	9	1.1
25	11	1.7
42	9 4	0 1.1
81	8	1.1
83	8	0.8
90	10	2.3

Backup 8: S2-S3 pairs positions



Backup 9: S2-S3 pairs positions



Backup 10: the shape of potential

