

Vertex Analysis



Sergei Merts

BERDS Meeting

11/02/2020

экстраполированные
Фильтром Калмана
Траектории

искусств. (виртуальные)
плоскости

восстановленные
треки

ожидаемая область,
где будет вершина
(Vertex)

виртуальная
плоскость

Точки
от экстра-
траекторий

$d_{ij} = \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2}$

Для каждой вирт. плоскости
строим $d_k = \sum d_{ij}$ - мера близости точек

Далее, строим для всех плоскостей зависимость $d_x(z_k)$:

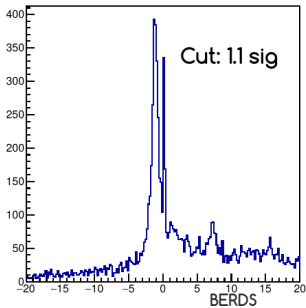
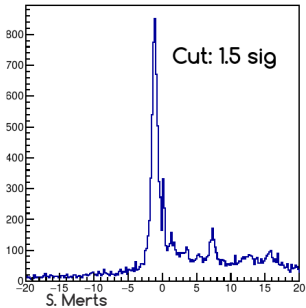
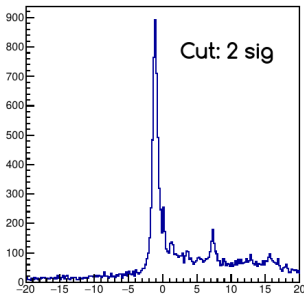
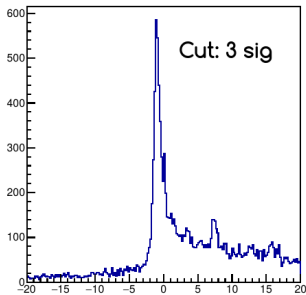
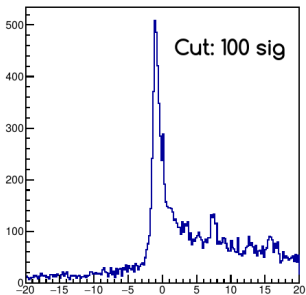
Аппроксимируем зависимость параболой

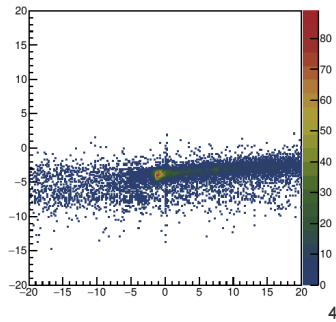
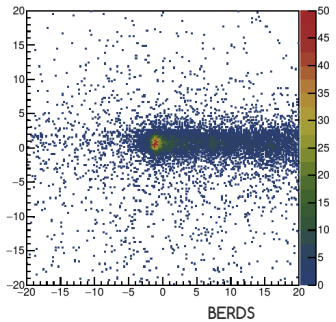
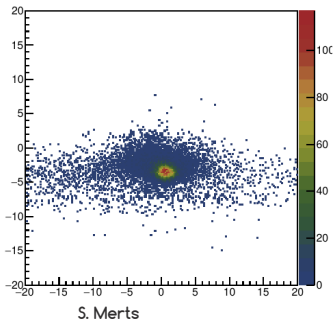
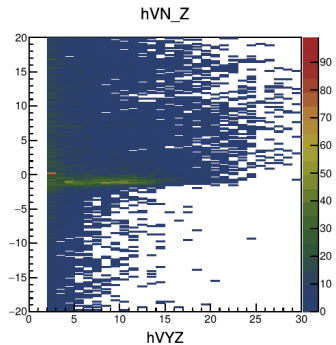
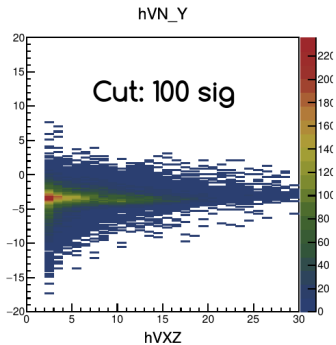
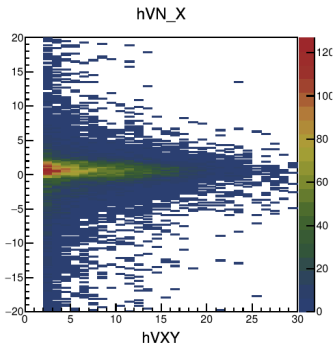
Находим ~~эту~~ вершину параболы. От вершины ~~эти~~
вправо и влево ~~от~~ откладываем расстояние, вдвое
меньшее, чем $(z_5 - z_1)/2$, то есть сузим область поиска.

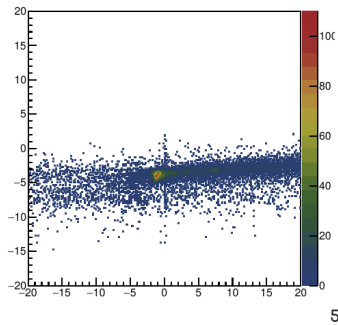
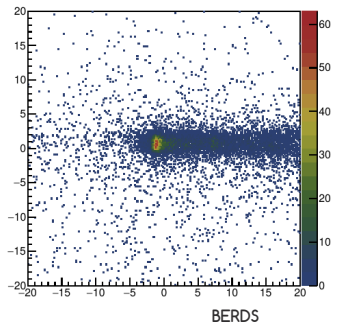
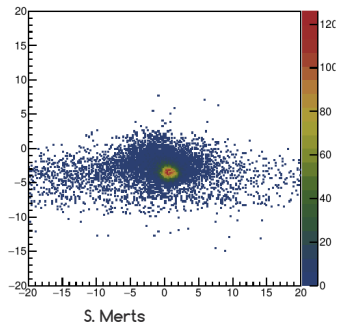
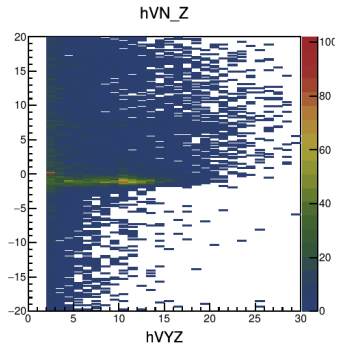
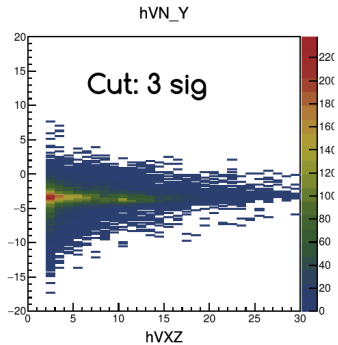
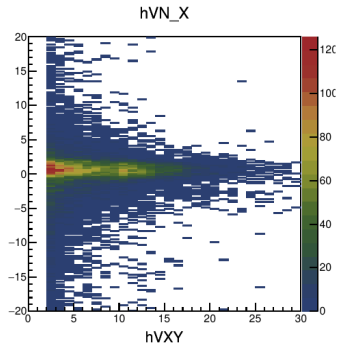
И повторяем метод.

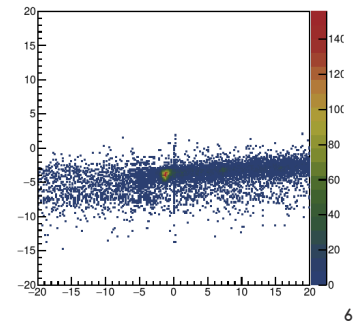
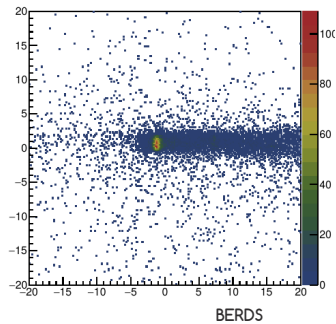
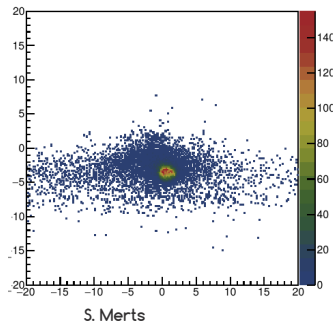
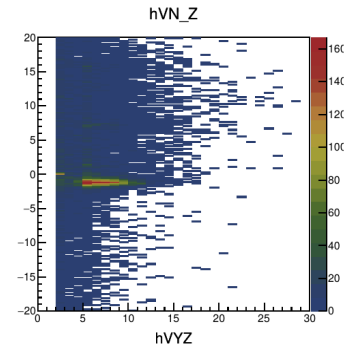
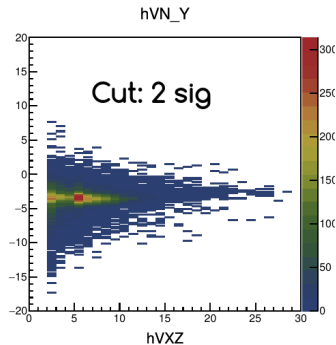
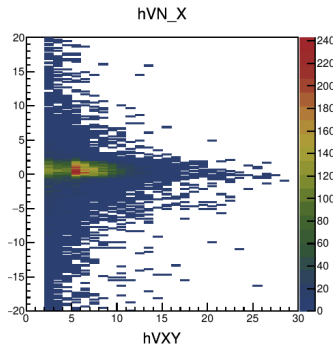
GEM детекторы
внутри магнита.

Z_vertex distribution

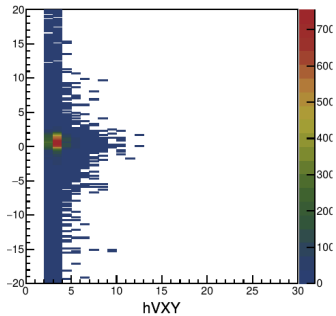




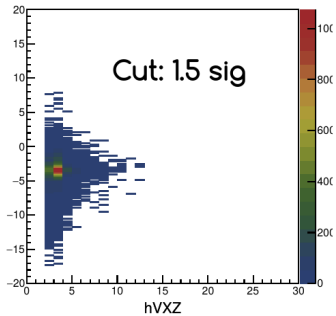




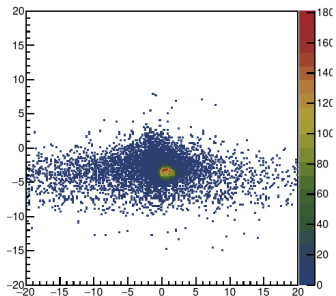
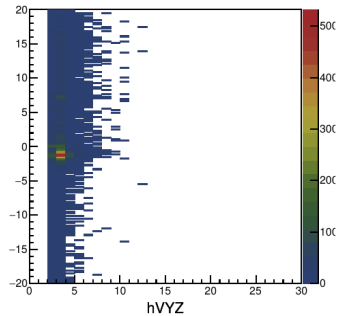
hVN_X



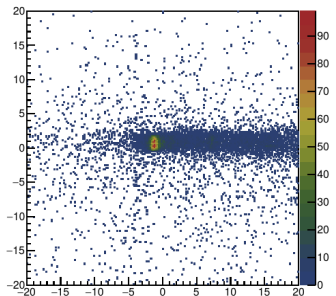
hVN_Y



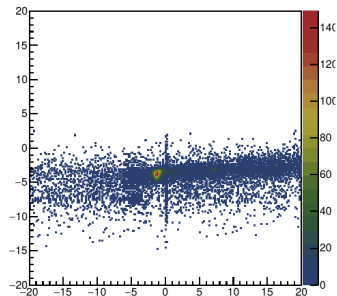
hVN_Z

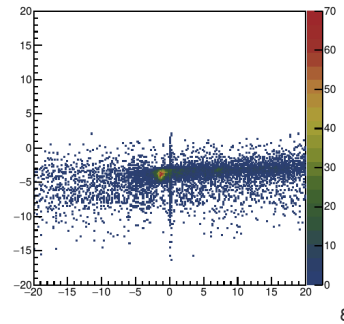
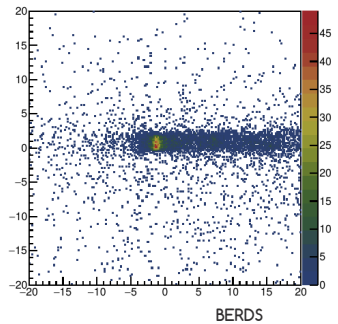
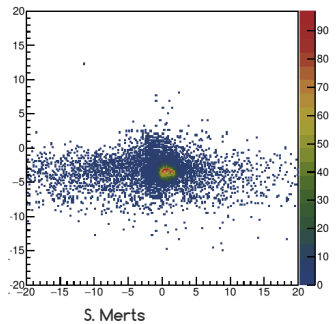
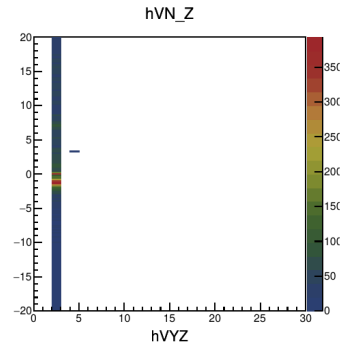
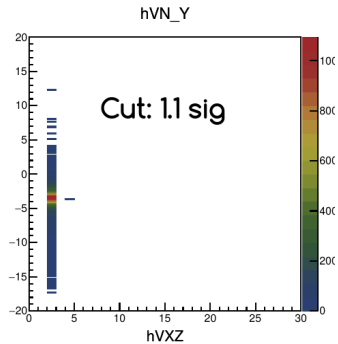
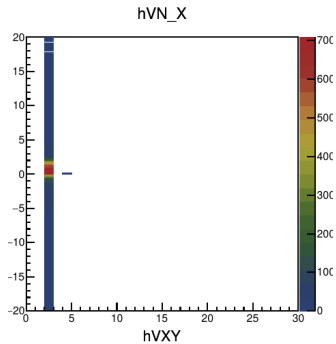


S. Merts

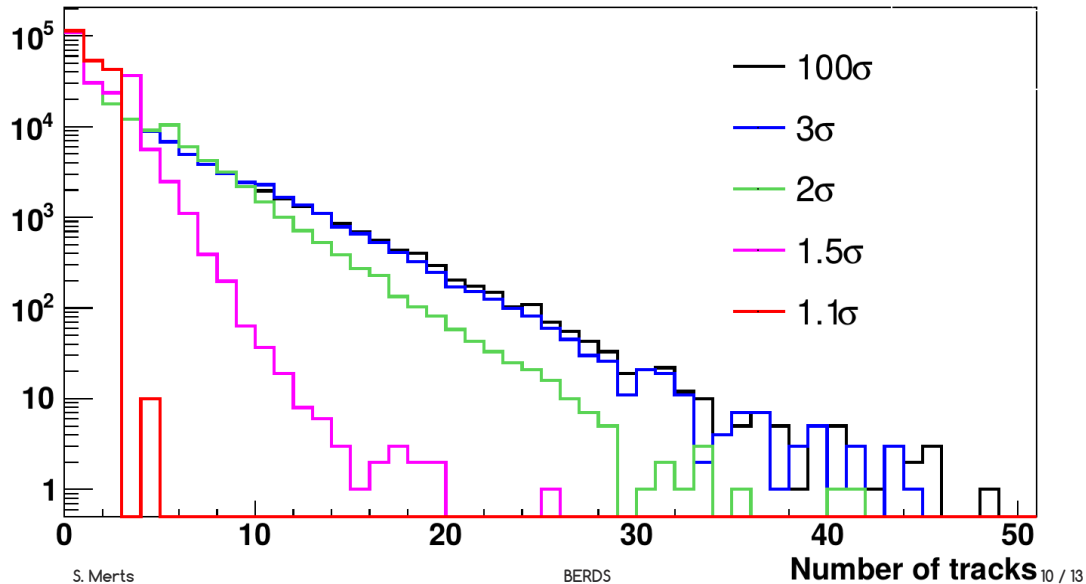


BERDS

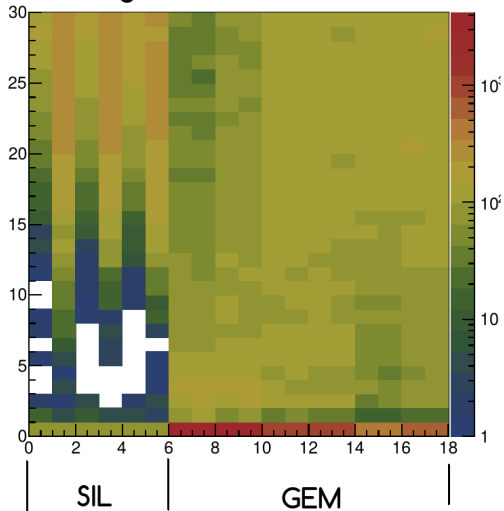




σ -cut	Const	μ	σ	Integral (-3, 0)
1.1	354	-1.14	0.59	2821
1.5	777	-1.11	0.50	5335
2.0	814	-1.08	0.45	5061
3.0	534	-0.93	0.55	3841
100.0	475	-0.88	0.59	3557

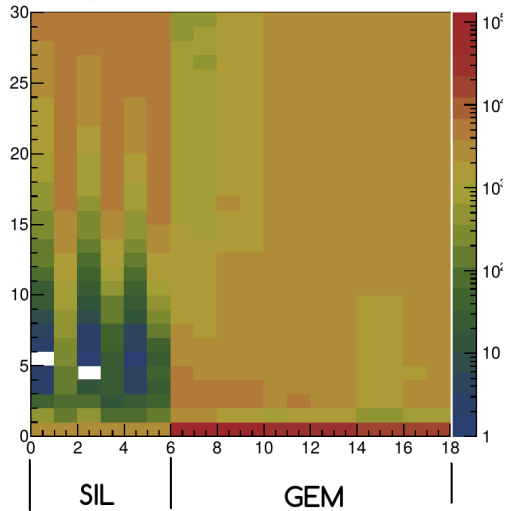


N digits in events with Vertex



S. Merts

N digits in events without Vertex



BERDS

SIL: 5 out of 6 digits, GEM: 8 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	78 / 72	73 / 66	63 / 53
SIL cut > 10	78 / 72	73 / 66	63 / 53
SIL cut > 20	64 / 58	61 / 54	52 / 43

SIL: 5 out of 6 digits, GEM: 10 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	53 / 41	49 / 36	39 / 26
SIL cut > 10	53 / 41	48 / 36	39 / 26
SIL cut > 20	44 / 33	41 / 29	33 / 21

SIL: 5 out of 6 digits, GEM: 11 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	36 / 21	33 / 18	26 / 12
SIL cut > 10	36 / 21	33 / 18	26 / 12
SIL cut > 20	31 / 17	28 / 14	23 / 10

SIL: 5 out of 6 digits, GEM: 12 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	34 / 18	30 / 15	24 / 10
SIL cut > 10	34 / 18	30 / 15	24 / 10
SIL cut > 20	29 / 15	26 / 12	22 / 8

SIL: 6 out of 6 digits, GEM: 8 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	77 / 71	73 / 66	63 / 53
SIL cut > 10	75 / 69	71 / 64	61 / 52
SIL cut > 20	43 / 36	41 / 34	36 / 27

SIL: 6 out of 6 digits, GEM: 10 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	53 / 41	48 / 36	39 / 25
SIL cut > 10	51 / 40	47 / 35	38 / 25
SIL cut > 20	30 / 21	28 / 18	24 / 13

SIL: 6 out of 6 digits, GEM: 11 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	36 / 21	33 / 17	26 / 12
SIL cut > 10	35 / 20	32 / 17	26 / 12
SIL cut > 20	22 / 11	20 / 10	18 / 7

SIL: 6 out of 6 digits, GEM: 12 out of 12 digits

	GEM digi > 3	GEM digi > 5	GEM digi > 10
SIL cut > 5	33 / 18	30 / 15	24 / 10
SIL cut > 10	33 / 18	29 / 15	24 / 10
SIL cut > 20	21 / 10	19 / 8	17 / 6