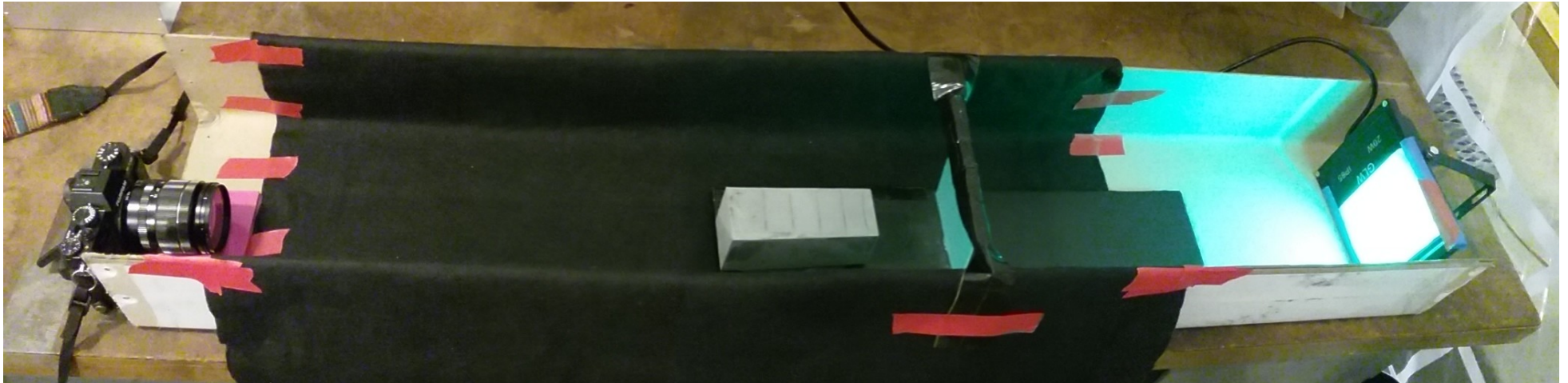
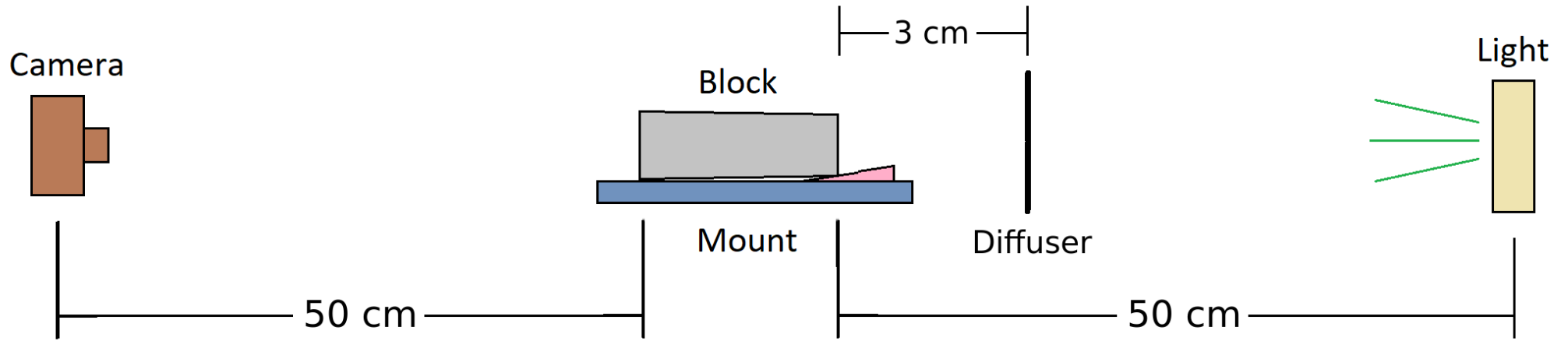


Block testing status

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October 24, 2017

Current setup



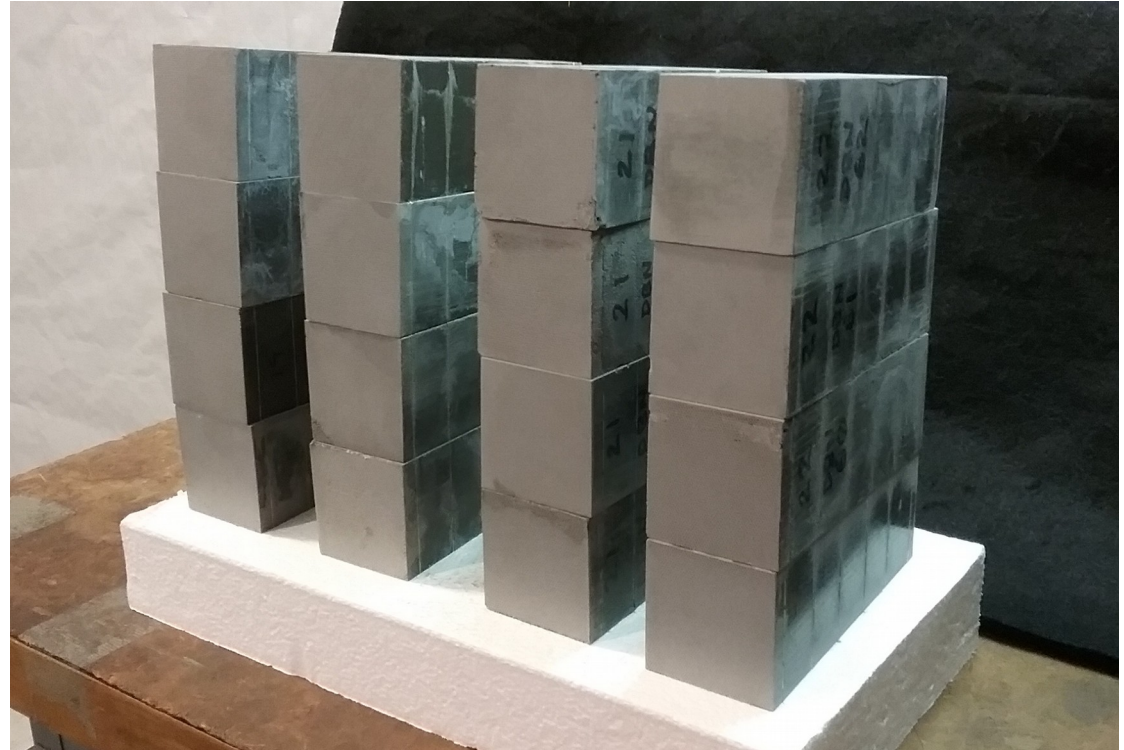
10/24/2017



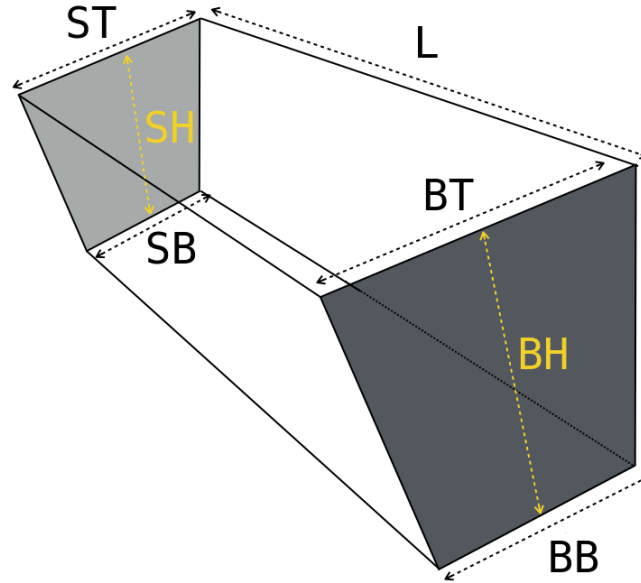
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What's new?

- Better tolerances.
- Masses.
- Diffuser.



Tolerances



Nominal values:

Block type	L (in)	BT (in)	BB (in)	BH (in)	ST (in)	SB (in)	SH (in)
19	5.342	2.085	2.020	2.157	1.875	1.815	1.989
20	5.412	2.085	2.018	2.152	1.877	1.815	1.989
21	5.489	2.085	2.015	2.147	1.879	1.815	1.989
22	5.572	2.085	2.013	2.142	1.881	1.815	1.989

Tolerances and masses

$$\Delta = (\text{real}) - (\text{nominal})$$

Green: too long.

Blue: too short.

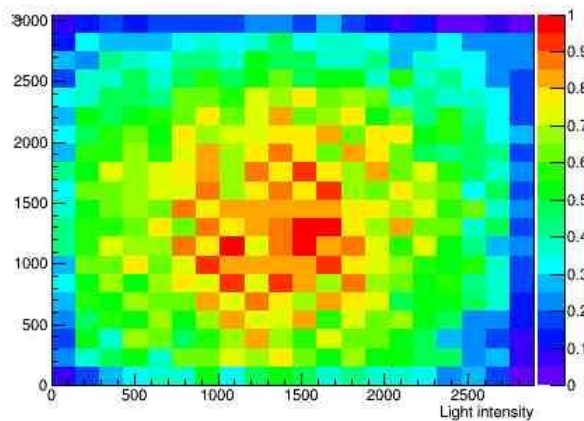
Black: within tolerance.

Block type	DBN	ΔL (in)	ΔBT (in)	ΔBB (in)	ΔBH (in)	ΔST (in)	ΔSB (in)	ΔSH (in)	Mass (g)
19	1	0.003	-0.009	-0.011	-0.024	-0.006	0.005	-0.022	3356
	7	0.003	-0.023	-0.002	-0.009	0.005	0.004	-0.007	3396
	49	-0.005	-0.007	-0.004	0.009	-0.006	0.001	-0.004	3320
20	50	0.002	-0.006	0.005	-0.002	0.010	0.014	0.000	3316
	10	-0.026	0.005	0.003	-0.007	0.006	0.006	0.000	3488
	53	0.006	0.005	0.000	-0.011	-0.001	-0.003	-0.009	3274
	54	0.002	-0.001	0.003	-0.019	0.005	0.006	-0.015	3284
	56	0.040	-0.003	-0.003	-0.014	-0.004	0.005	-0.014	3374
21	6	0.003	-0.010	0.005	-0.002	-0.004	0.000	0.000	3522
	52	0.005	-0.013	-0.006	-0.007	0.005	0.003	-0.006	3426
	57	-0.001	0.001	-0.002	-0.010	-0.008	0.004	-0.009	3398
	59	0.007	0.000	0.009	-0.002	-0.006	-0.002	-0.010	3388
22	3	0.003	-0.012	0.003	-0.005	-0.005	0.006	-0.009	3376
	60	0.003	-0.008	0.006	-0.004	-0.007	0.003	-0.013	3388
	61	0.003	-0.003	0.004	-0.009	0.001	0.003	0.001	3536
	62	-0.019	-0.003	0.003	-0.008	0.002	0.005	-0.004	3366

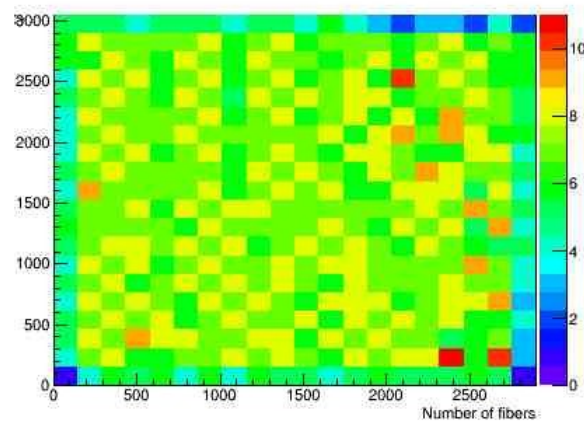
The blocks type 20 were trimmed to match the tolerance.

2D distributions for camera-block distance ~ 10 cm

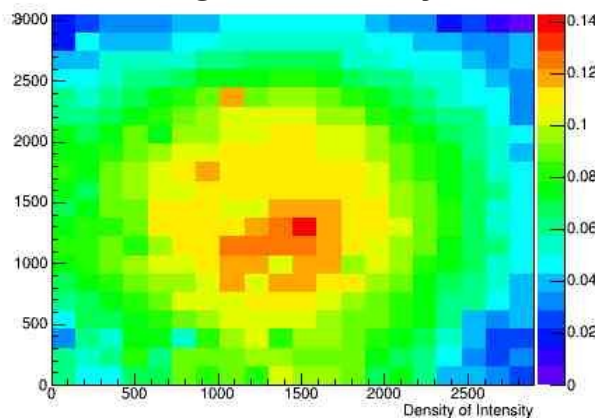
Block:
DBN 60
(wide end)



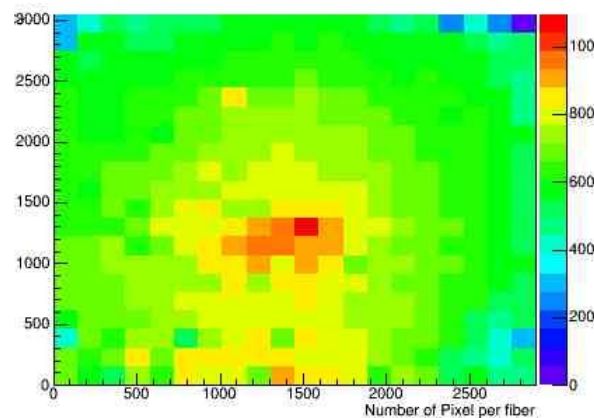
Light intensity



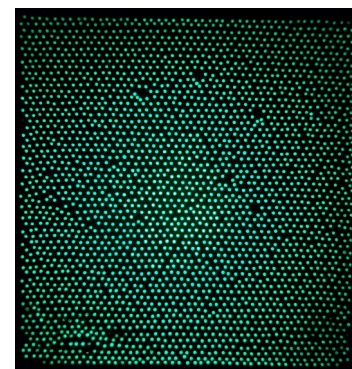
Number of fibers



Density of intensity

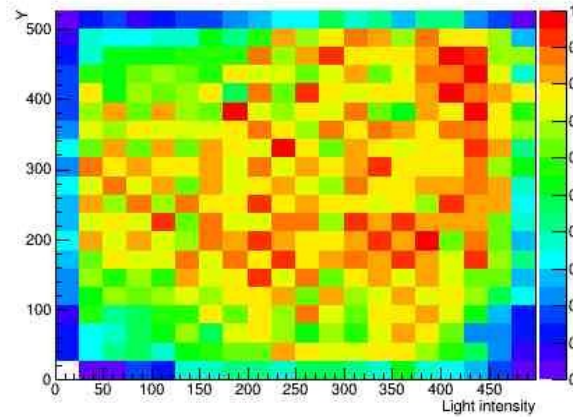


Number of pixels per fiber

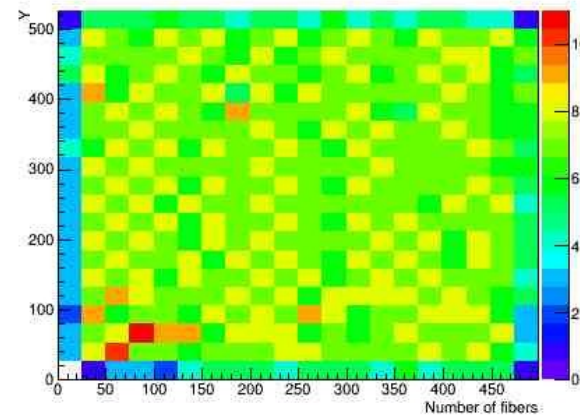


2D distributions for camera-block distance ~50 cm without diffuser

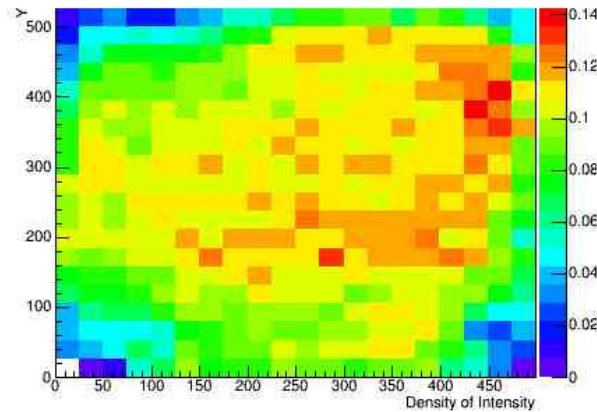
Block:
DBN 60
(wide end)



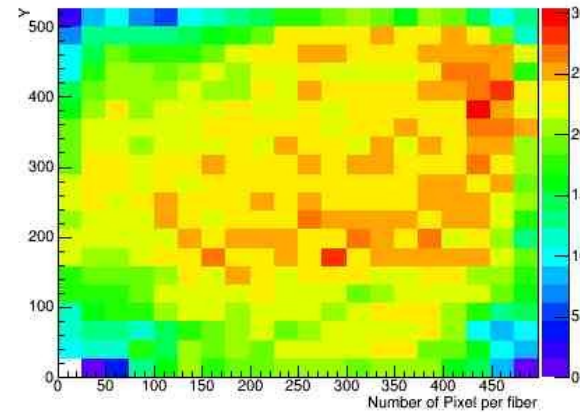
Light intensity



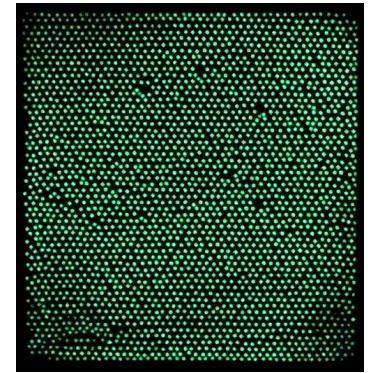
Number of fibers



Density of intensity

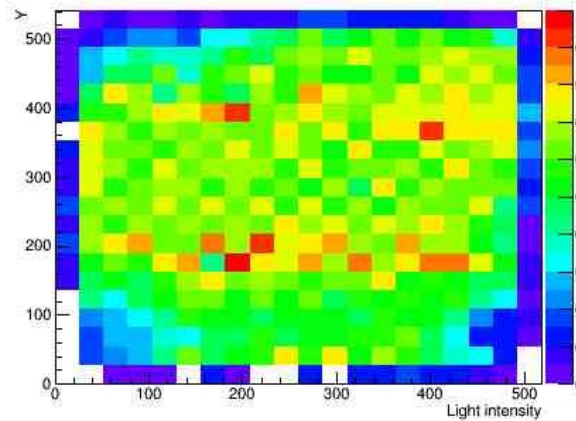


Number of pixels per fiber

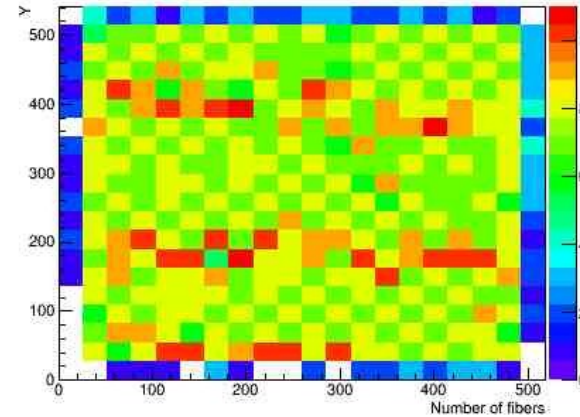


2D distributions for camera-block distance ~50 cm with diffuser

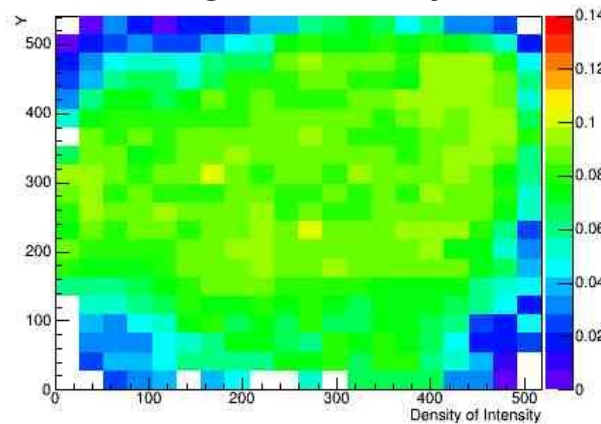
Block:
DBN 60
(wide end)



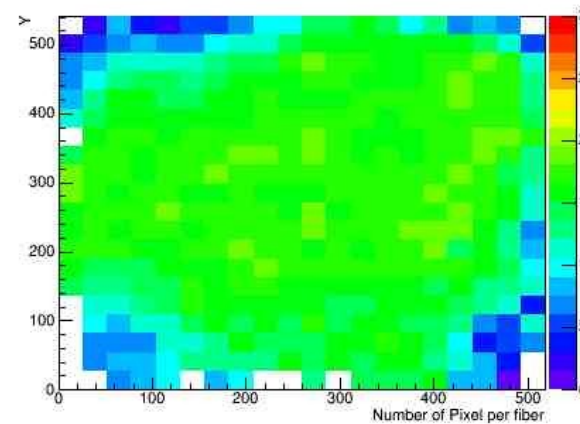
Light intensity



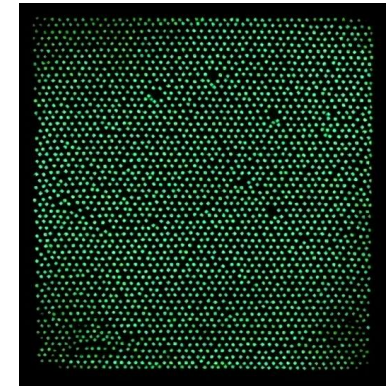
Number of fibers



Density of intensity



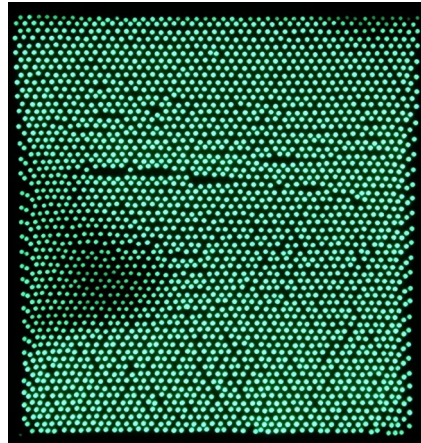
Number of pixels per fiber



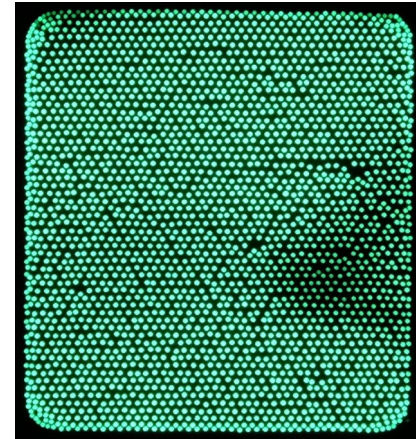
- Diffuser seems to make the 2D distribution slightly more uniform but doesn't get rid of the non-uniformities on the edges of the block.
- To explain this, consider the following block as example:

DBN 56

Wide



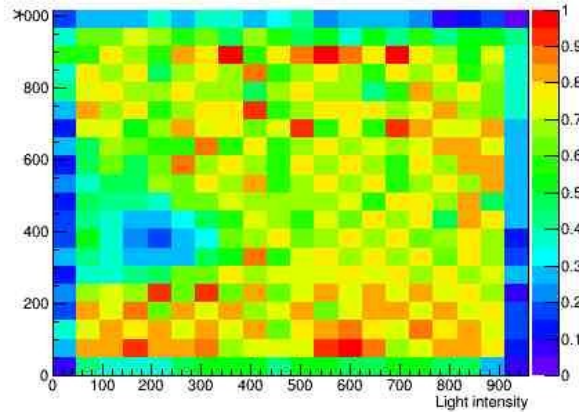
Narrow



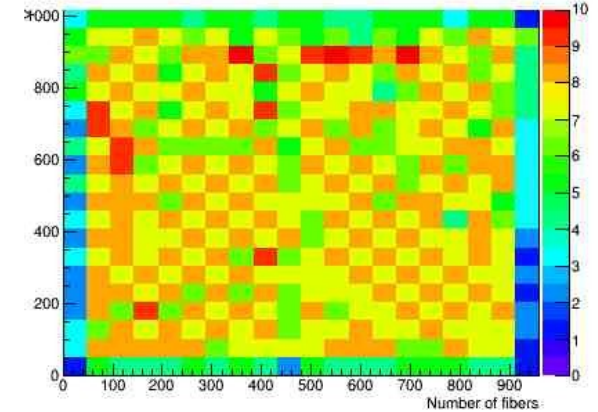
2D distributions for camera-block distance ~50 cm without diffuser and for the wide end

DBN 56, wide end

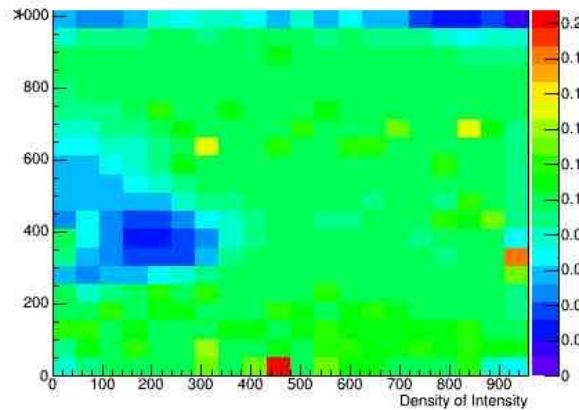
Except for the big cloud on the left, the 2D distributions of this block seem to be quite uniform, and this is without diffuser.



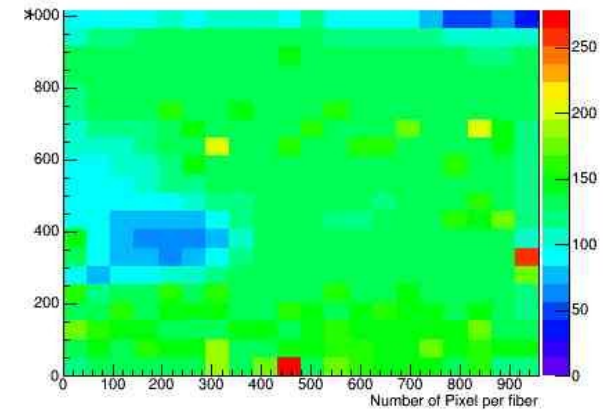
Light intensity



Number of fibers



Density of intensity



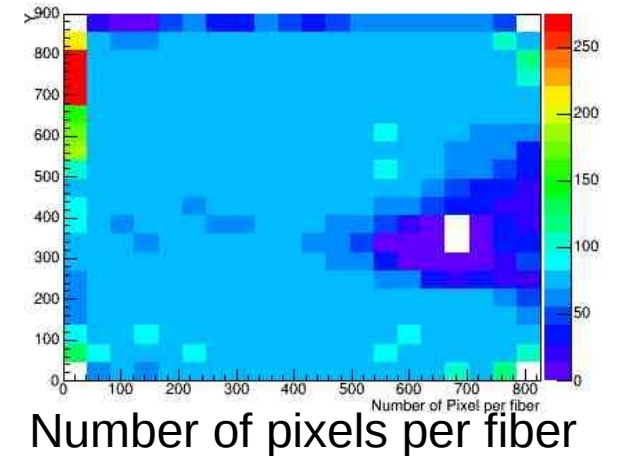
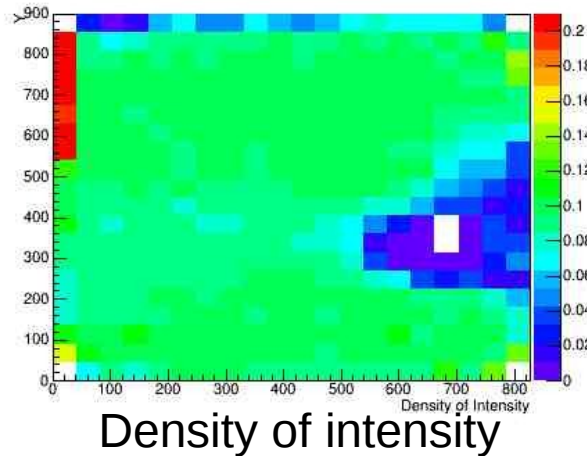
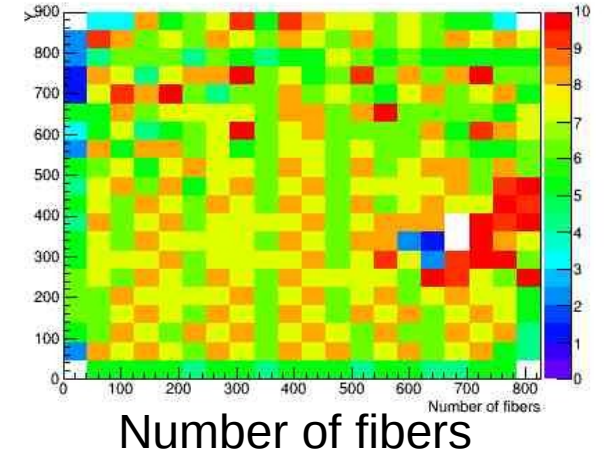
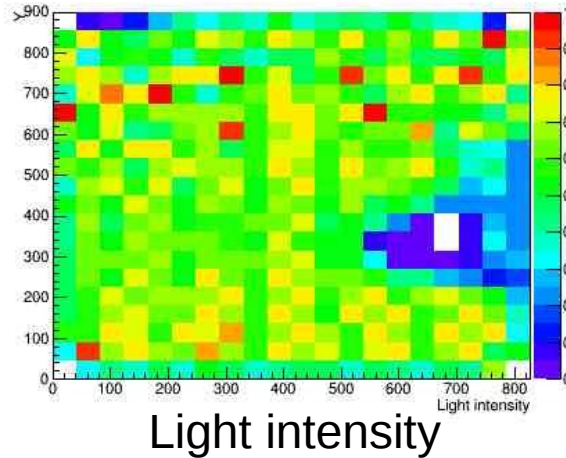
Number of pixels per fiber

2D distributions for camera-block distance ~50 cm without diffuser and for the narrow end

DBN 56, narrow end

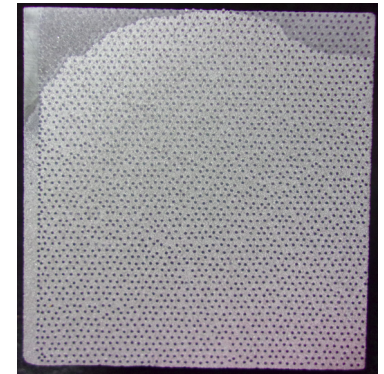
The 2D distributions are a reflection of the wide end distributions.

If the lamp was causing the non-uniformities, they would appear on the same side when the block is rotated. But since we have a reflection, the non-uniformities must not come from the lamp.



Factors involved in non-uniformity

- Small distance between block and camera.
 - Solved by increasing the distance to ~50 cm.
- Clouds on the surface of the block.
 - Can be corrected by retouching the ends in some cases.
- Edge effect.
 - Can be minimized but not completely removed.



Block DBN 53
showing a glue cloud