Robotics Assignment 1

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Section:	2
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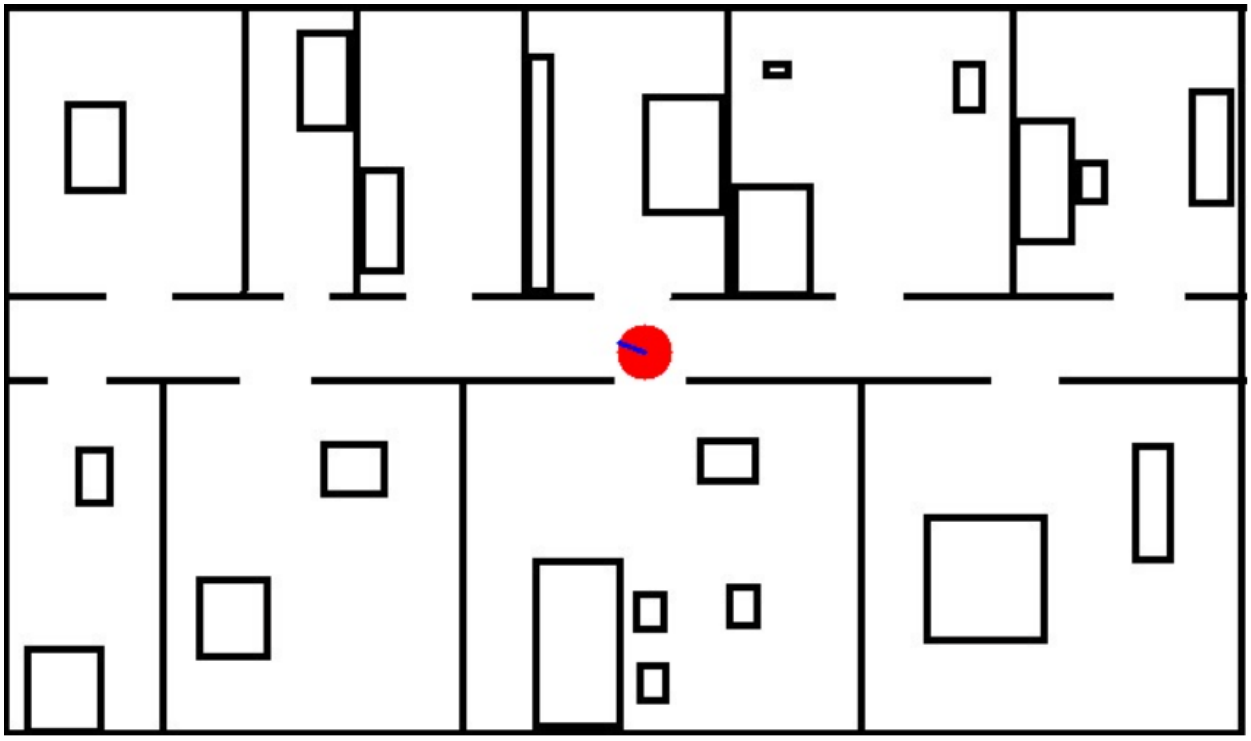
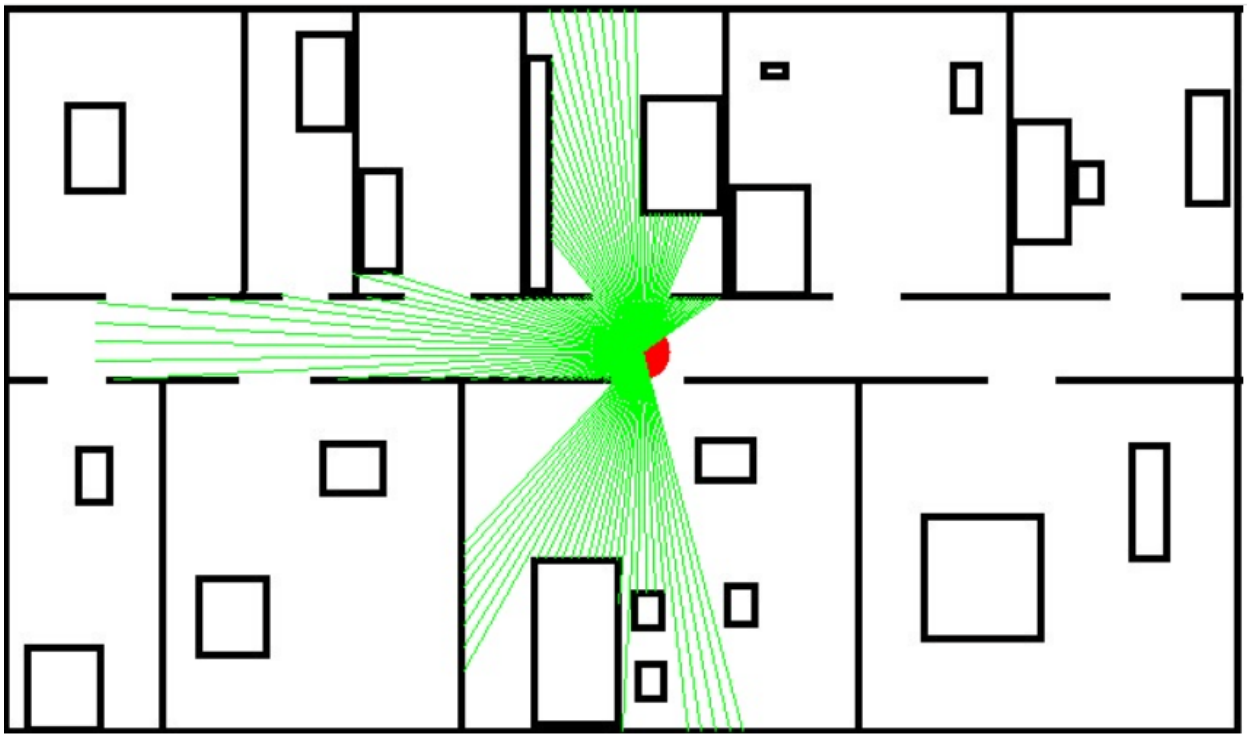
Requirement 1

Initial map with robot pose (x,y,theta) = (350, 190, 200)



Robot rays visualization



Note: endpoint and distance is measured with pixels on the image
(for distance with cm, just multiply by 4)

angle	endpoint	distance(px)	isobstacle(hit an obstacle 1, reach max range 0)
75	(405, 398)	215.14878572745886	1
77	(398, 398)	213.46662502602135	1
79	(390, 398)	211.81123671797963	1
81	(382, 398)	210.44714300745449	1
83	(375, 398)	209.49701668520245	1
85	(362, 322)	132.54433220624713	1
87	(357, 321)	131.18688958886096	1
89	(352, 322)	132.015150645674	1
91	(347, 322)	132.03408650799233	1
93	(339, 398)	208.290662296705	1
95	(337, 328)	138.61096637712328	1
97	(336, 304)	114.85643212288984	1
99	(332, 303)	114.42464769445436	1
101	(328, 303)	115.12167476196652	1
103	(324, 303)	115.95257651298655	1
105	(320, 303)	116.91449867317569	1
107	(315, 303)	118.29623831720095	1
109	(311, 303)	119.54078801814885	1
111	(306, 303)	121.26417442921878	1
113	(302, 303)	122.7721466783081	1
115	(297, 303)	124.8118584109699	1
117	(292, 303)	127.01574705523721	1
119	(252, 365)	200.57168294652163	1
121	(252, 352)	189.33568073662187	1
123	(252, 340)	179.17589123540031	1
125	(252, 329)	170.07351351694948	1
127	(252, 319)	162.00308639035245	1
129	(252, 311)	155.7080601638849	1
131	(252, 302)	148.8220413782851	1
133	(252, 295)	143.62799170078233	1
135	(333, 207)	24.041630560342615	1
137	(333, 206)	23.345235059857504	1
139	(333, 205)	22.67156809750927	1
141	(329, 207)	27.018512172212592	1
143	(331, 204)	23.600847442411894	1
145	(329, 205)	25.80697580112788	1
147	(329, 204)	25.238858928247925	1
149	(325, 205)	29.154759474226502	1
151	(323, 205)	30.886890422961002	1
153	(321, 205)	32.64965543462902	1
155	(318, 205)	35.34119409414458	1
157	(315, 205)	38.07886552931954	1

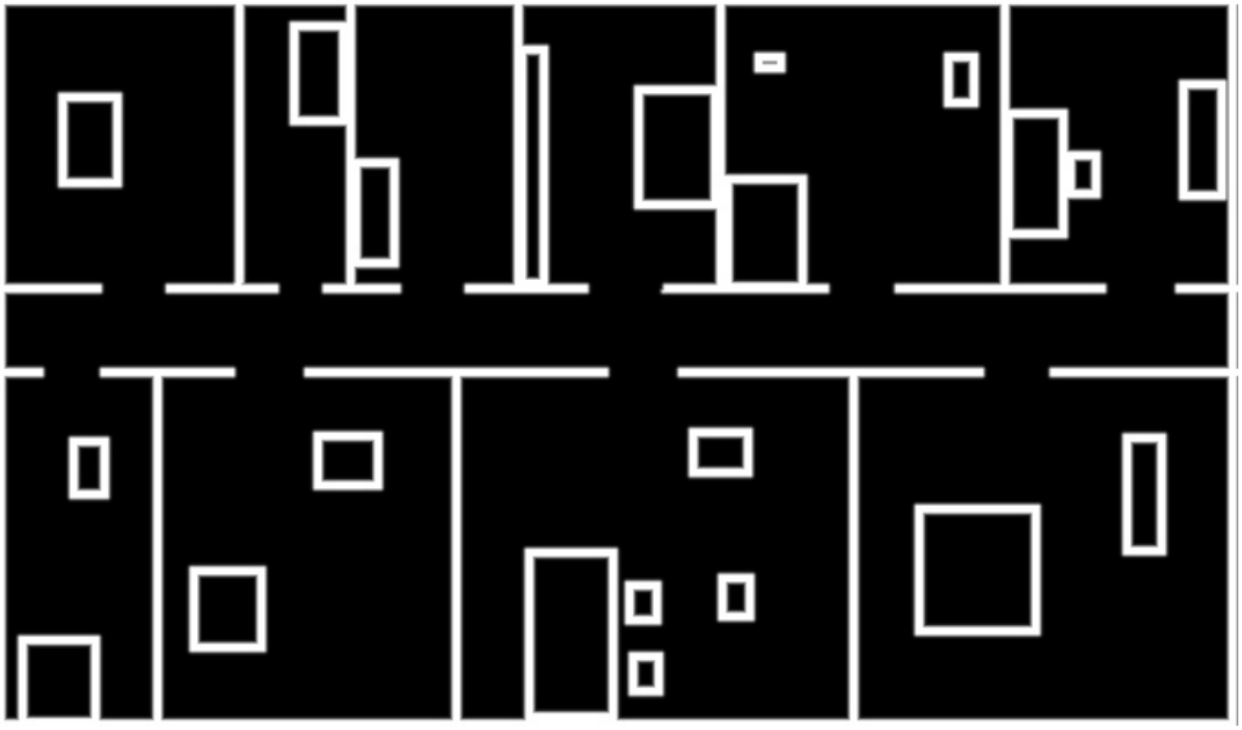
159	(311, 205)	41.78516483155236	1
161	(307, 205)	45.5411901469428	1
163	(302, 205)	50.28916384272063	1
165	(295, 205)	57.0087712549569	1
167	(286, 205)	65.73431371817918	1
169	(274, 205)	77.46612162745726	1
171	(256, 205)	95.1892851112981	1
173	(229, 205)	121.92620719107111	1
175	(183, 205)	167.6722994414999	1
177	(60, 205)	290.38767191463205	1
179	(50, 195)	300.04166377354994	0
181	(50, 184)	300.0599940011997	0
183	(50, 174)	300.4263636900064	0
185	(51, 163)	300.2165884823822	0
187	(112, 160)	239.88330496305906	1
189	(152, 159)	200.4120754844877	1
191	(199, 160)	153.95129099815955	1
193	(219, 160)	134.39121995130486	1
195	(191, 147)	164.7118696390761	1
197	(208, 146)	148.66068747318505	1
199	(264, 160)	91.0823802938856	1
201	(273, 160)	82.63776376451628	1
203	(280, 160)	76.15773105863909	1
205	(286, 160)	70.68238818828917	1
207	(292, 160)	65.29931086925804	1
209	(296, 160)	61.773780845922005	1
211	(300, 160)	58.309518948453004	1
213	(304, 160)	54.91812087098393	1
215	(308, 160)	51.61395160225576	1
217	(310, 160)	50.0	1
219	(313, 160)	47.634021455258214	1
221	(315, 160)	46.09772228646444	1
223	(318, 160)	43.86342439892262	1
225	(319, 159)	43.840620433565945	1
227	(321, 159)	42.44997055358225	1
229	(322, 158)	42.5205832509386	1
231	(300, 128)	79.64923100695951	1
233	(300, 124)	82.80096617793781	1
235	(300, 119)	86.83893136145792	1
237	(300, 114)	90.97252332435328	1
239	(300, 107)	96.89685237405806	1
241	(300, 101)	102.08329931972223	1
243	(300, 93)	109.12836478203089	1
245	(300, 84)	117.2006825918689	1
247	(300, 74)	126.31706139710502	1
249	(300, 61)	138.351002887583	1

251	(300, 47)	151.48927354766738	1
253	(300, 29)	168.5852899869974	1
255	(299, 2)	194.79476378999513	1
257	(306, 2)	193.08029417835473	1
259	(313, 2)	191.60636732634956	1
261	(320, 2)	190.3785702225962	1
263	(327, 2)	189.40168953839878	1
265	(333, 2)	188.76705220985997	1
267	(340, 2)	188.26576959181932	1
269	(346, 2)	188.04254837669055	1
271	(351, 115)	75.0066663703967	1
273	(354, 114)	76.10519036176179	1
275	(357, 114)	76.32168761236873	1
277	(359, 114)	76.53103945458993	1
279	(362, 114)	76.94153624668537	1
281	(365, 114)	77.46612162745726	1
283	(367, 114)	77.87810988975015	1
285	(370, 114)	78.587530817554	1
287	(373, 114)	79.40403012442127	1
289	(376, 114)	80.32434251209281	1
291	(379, 114)	81.34494452638098	1
293	(382, 114)	82.46211251235322	1
295	(365, 158)	35.34119409414458	1
297	(365, 161)	32.64965543462902	1
299	(367, 160)	34.48187929913333	1
301	(368, 160)	34.9857113690718	1
303	(369, 160)	35.510561809129406	1
305	(371, 160)	36.61966684720111	1
307	(373, 160)	37.8021163428716	1
309	(374, 160)	38.41874542459709	1
311	(376, 160)	39.698866482558415	1
313	(378, 160)	41.036569057366385	1
315	(380, 160)	42.42640687119285	1
317	(382, 160)	43.86342439892262	1
319	(385, 160)	46.09772228646444	1
321	(387, 160)	47.634021455258214	1
323	(389, 160)	49.20365840057018	1
325	(392, 160)	51.61395160225576	1

Requirement 2

Likelihood field

Sigma = 1



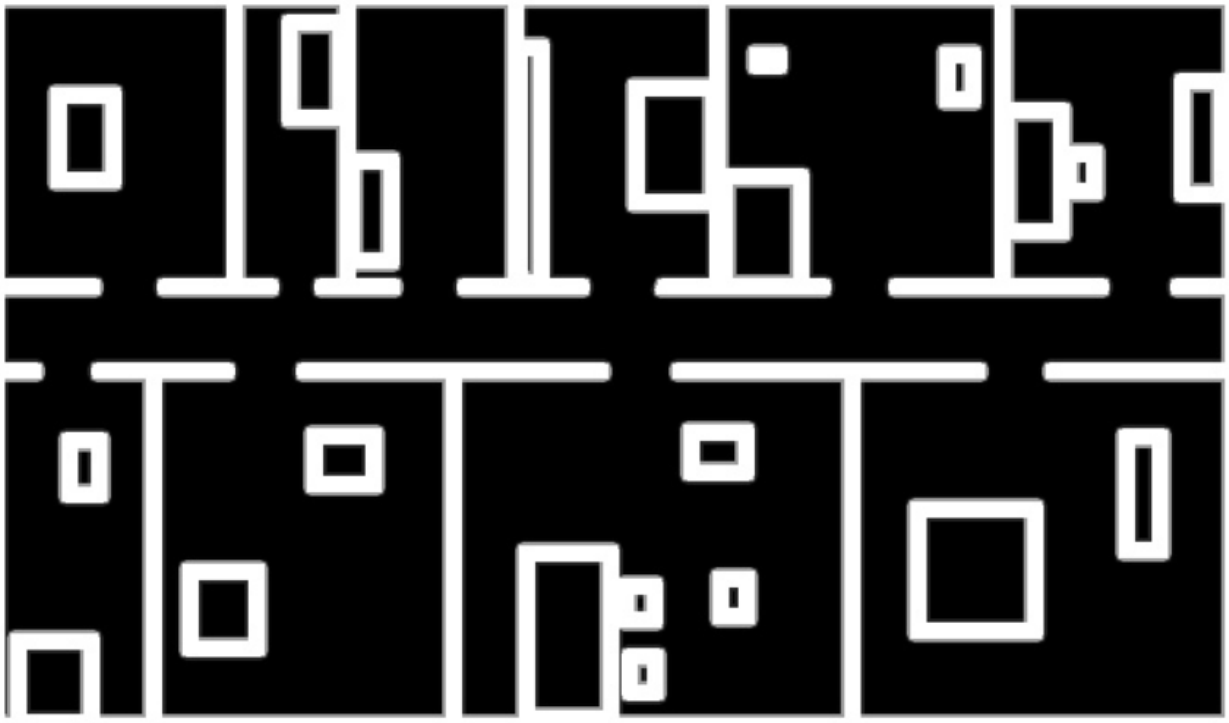
Sigma = 5

Sigma = 10

Probability map

Max ray length = 0.1 m

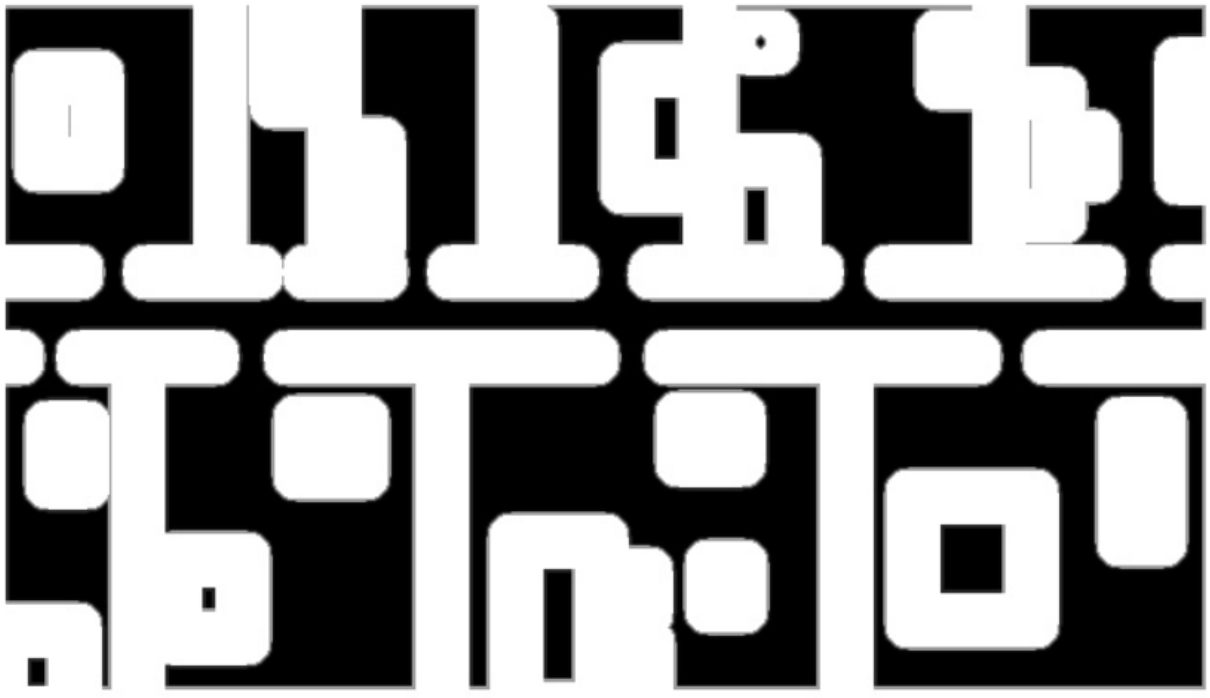
Sigma = 1



Sigma = 5

Sigma = 10

Max ray length = 0.5 m
Sigma = 1



Sigma = 5

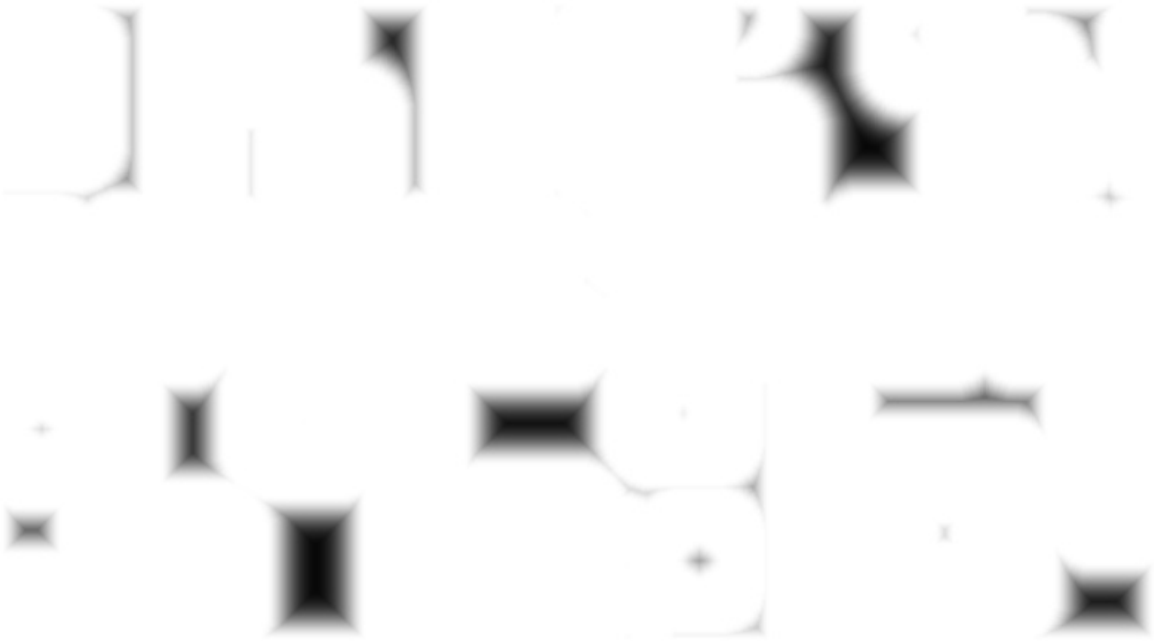
Sigma = 10

Max ray length = 1 m

Sigma = 1

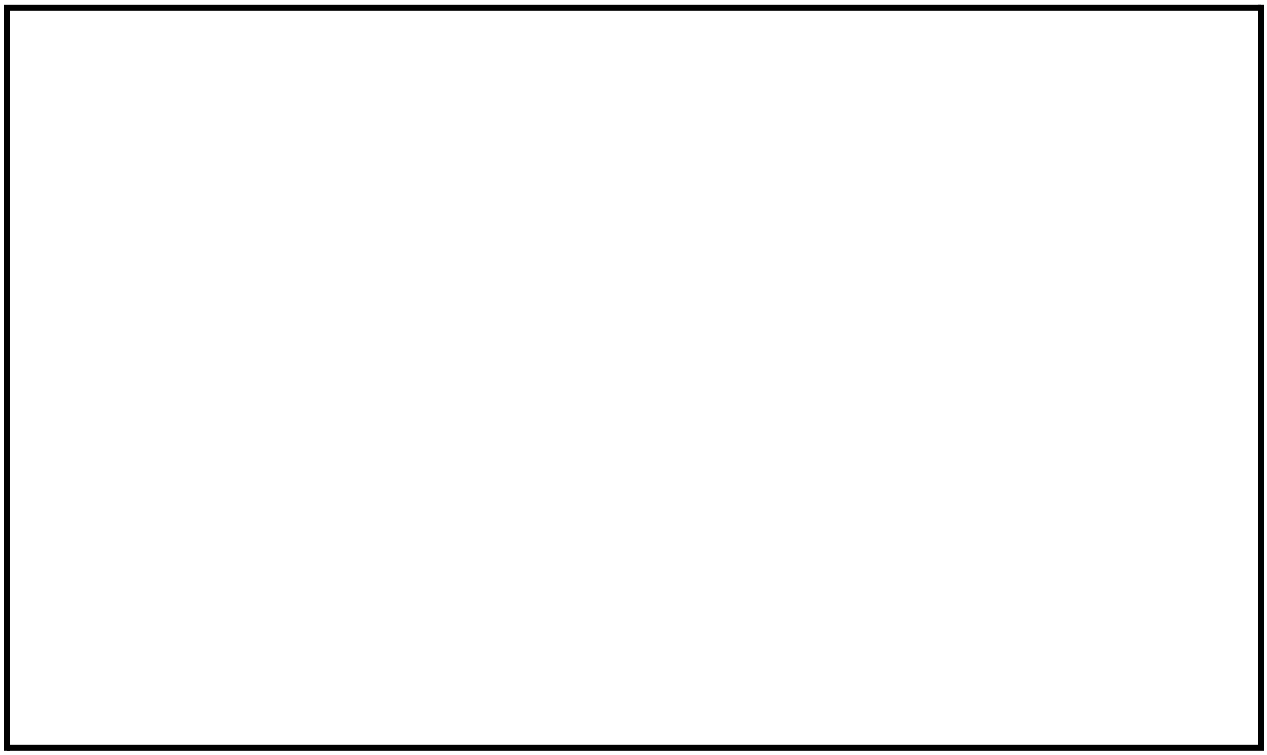
Sigma = 5

Sigma = 10

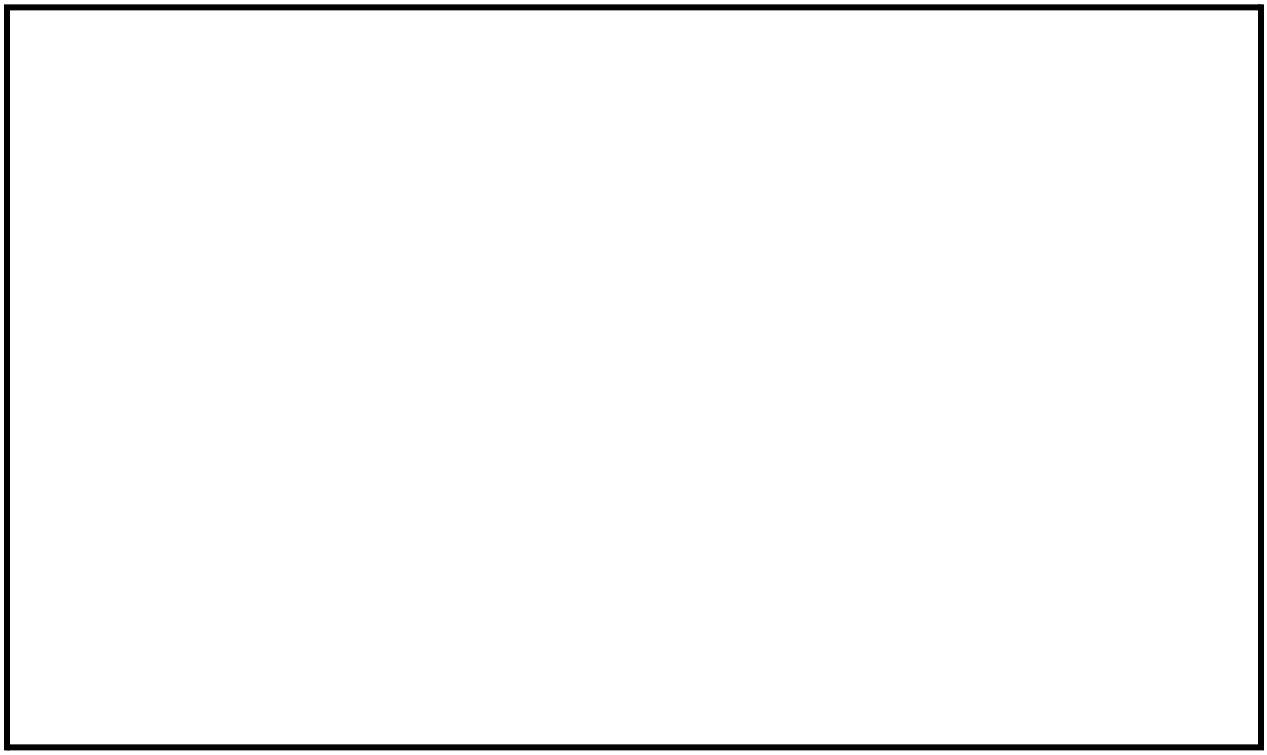


Max ray length = 3 m

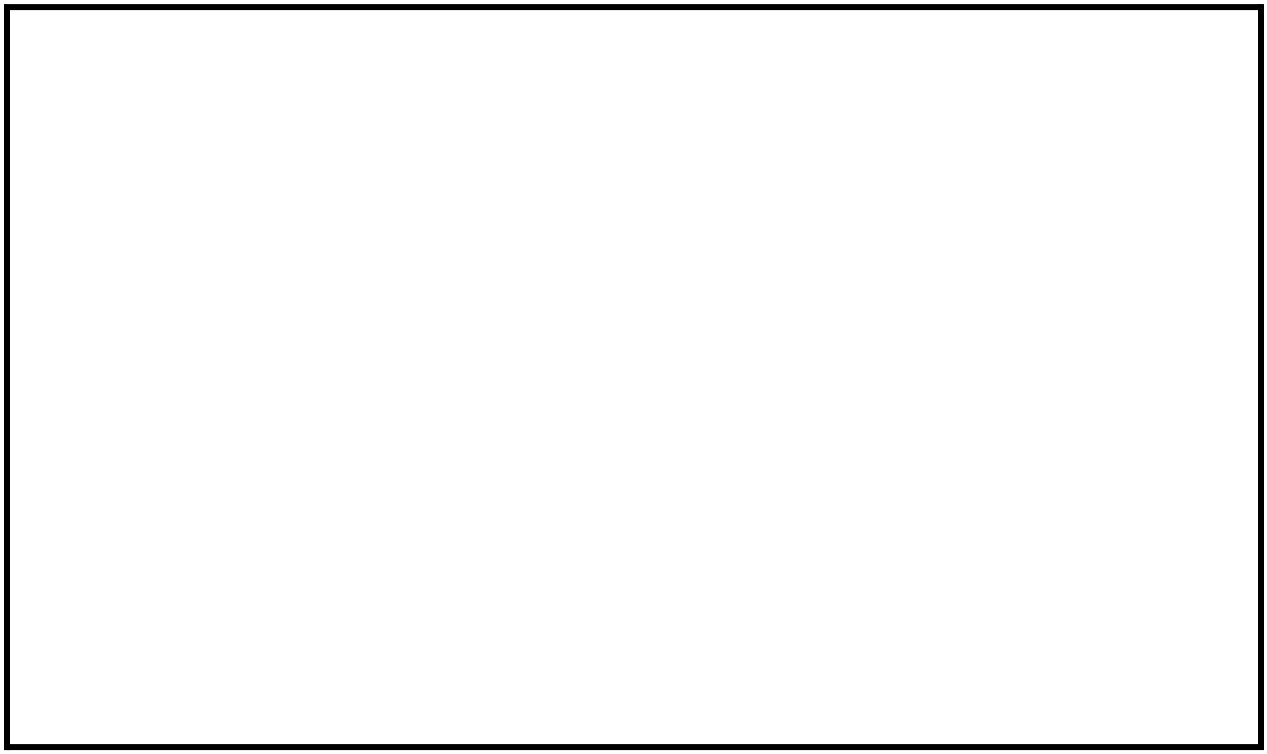
Sigma = 1



Sigma = 5



Sigma = 10



All were just whole white images

Max ray length > 3m will give the same results as length = 3m