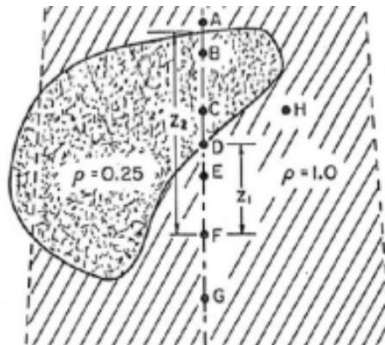


Hoja 4

1. Dada una tasa de dosis de 300 MU/min en un punto ubicado a 15 cm de profundidad para un campo de 15×15 de un haz de fotones de Co-60 y SSD de 80 cm ($\dot{D}(15; 15 \times 15; 80; 60Co)$), calcula mediante técnicas SSD y SAD, la tasa de dosis a 10 cm de profundidad para un tamaño de campo de 20×20 y SSD de 140 para el mismo haz de fotones. El medio irradiado es homogéneo y de superficie plana normal al eje de simetría del haz.
2. Considera un volumen típico que contiene una cierta inhomogeneidad (figura). Determina el factor de corrección para los puntos C y F, ubicados a 4 y 8 cm de profundidad, respectivamente, asumiendo la distancia entre la inhomogeneidad y la superficie de incidencia igual a 1,5 cm y el espesor de la inhomogeneidad (a lo largo del eje central del campo) de 3,5 cm. El haz incidente es de una máquina de $60Co$ con tamaño de campo de 10×10 . Compara los resultados utilizando el método de cociente de TAR y el método ley de potencias para el cociente de TAR.



3. Calcula el porcentaje de dosis en profundidad para el punto S ubicado *off-axis* con $h = 3$ cm y $z = 5$ cm para el caso de una superficie de incidencia con contorno irregular CC, asumiendo que se irradia con un haz de Co-60 con tamaño de campo de 10×10 y SSD de 80 cm. Compara los resultados derivados del método de la SSD efectiva y el método del TAR.

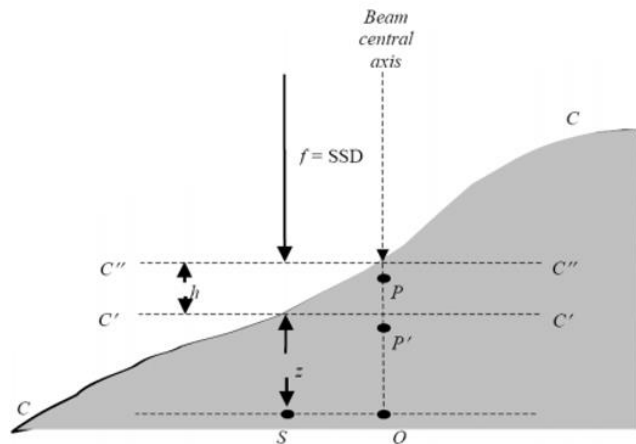


TABLE 10-4
Side Lengths of Square Fields Equivalent to Rectangular Fields

Long Axis (cm)	Short Axis (cm)														
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
2	2.0														
4	2.7	4.0													
6	3.1	4.8	6.0												
8	3.4	5.4	6.9	8.0											
10	3.6	5.8	7.5	8.9	10.0										
12	3.7	6.1	8.0	9.6	10.9	12.0									
14	3.8	6.3	8.4	10.1	11.6	12.9	14.0								
16	3.9	6.5	8.6	10.5	12.2	13.7	14.9	16.0							
18	4.0	6.6	8.9	10.8	12.7	14.3	15.7	16.9	18.0						
20	4.0	6.7	9.0	11.1	13.0	14.7	16.3	17.7	18.9	20.0					
22	4.0	6.8	9.1	11.3	13.3	15.1	16.8	18.3	19.7	20.9	22.0				
24	4.1	6.8	9.2	11.5	13.5	15.4	17.2	18.8	20.3	21.7	22.9	24.0			
26	4.1	6.9	9.3	11.6	13.7	15.7	17.5	19.2	20.9	22.4	23.7	24.9	26.0		
28	4.1	6.9	9.4	11.7	13.8	15.9	17.8	19.6	21.3	22.9	24.4	25.7	27.0	28.0	
30	4.1	6.9	9.4	11.7	13.9	16.0	18.0	19.9	21.7	23.3	24.9	26.4	27.7	29.0	30.0

Percent Depth Dose for Rectangular Fields

(e)	Cobalt-60			11 mm Pb			SSD 80 cm				
<i>d</i> (cm)	0×0	4×4	4×6	4×8	4×10	4×15	4×20	6×6	6×8	6×10	6×15
0.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	95.4	96.8	97.0	97.2	97.3	97.4	97.4	97.4	97.6	97.7	97.8
2	87.1	90.6	91.2	91.5	91.6	91.8	91.8	91.9	92.2	92.5	92.7
3	79.5	84.7	85.5	85.9	86.1	86.4	86.4	86.5	86.9	87.3	87.6
4	72.7	79.0	79.9	80.4	80.6	81.0	81.1	81.1	81.7	82.1	82.5
5	66.5	73.5	74.5	75.1	75.3	75.7	75.9	75.9	76.6	77.0	77.5
6	60.8	68.1	69.2	69.9	70.1	70.5	70.7	70.7	71.5	71.9	72.5
7	55.6	62.9	64.1	64.8	65.1	65.5	65.7	65.7	66.5	67.0	67.6
8	50.9	58.0	59.2	59.9	60.3	60.8	61.0	60.8	61.7	62.2	62.9
9	46.6	53.5	54.7	55.3	55.8	56.3	56.6	56.2	57.1	57.7	58.5
10	42.7	49.3	50.5	51.1	51.6	52.2	52.5	52.0	52.9	53.5	54.4
11	39.2	45.5	46.6	47.3	47.8	48.4	48.6	48.1	49.0	49.6	50.5
12	35.9	41.9	43.0	43.7	44.2	44.8	45.1	44.5	45.4	46.0	46.9
13	32.9	38.6	39.7	40.4	40.9	41.4	41.8	41.1	42.0	42.7	43.6
14	30.2	35.6	36.6	37.3	37.8	38.4	38.7	38.0	38.9	39.6	40.5
15	27.7	32.9	33.8	34.5	35.0	35.6	35.9	35.2	36.1	36.7	37.6
16	25.4	30.4	31.3	32.0	32.4	33.1	33.4	32.6	33.5	34.1	35.0
17	23.3	28.1	29.0	29.6	30.0	30.7	31.0	30.2	31.1	31.6	32.6
18	21.4	26.0	26.9	27.4	27.9	28.5	28.8	28.0	28.8	29.4	30.3
19	19.6	24.0	24.9	25.4	25.9	26.5	26.8	26.0	26.7	27.4	28.2
20	18.0	22.1	22.9	23.5	23.9	24.5	24.8	24.0	24.8	25.4	26.2
	6×20	8×8	8×10	8×15	8×20	10×10	10×15	10×20	15×15	15×20	20×20
0.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	97.8	97.8	98.0	98.1	98.1	98.2	98.3	98.3	98.4	98.4	98.4
2	92.8	92.7	93.0	93.2	93.3	93.3	93.6	93.6	93.9	93.9	94.0
3	87.7	87.6	87.9	88.3	88.5	88.3	88.8	88.9	89.3	89.4	89.6
4	82.7	82.5	82.9	83.4	83.6	83.4	84.0	84.2	84.7	84.9	85.2
5	77.7	77.4	77.9	78.5	78.8	78.5	79.2	79.5	80.1	80.4	80.8
6	72.7	72.4	73.0	73.7	74.0	73.6	74.4	74.7	75.4	75.8	76.4
7	67.9	67.5	68.1	68.9	69.2	68.8	69.8	70.1	70.8	71.4	72.1
8	63.3	62.7	63.4	64.3	64.7	64.1	65.2	65.7	66.5	67.2	68.0
9	58.9	58.2	58.9	59.9	60.4	59.7	60.9	61.4	62.3	63.1	64.0
10	54.8	54.0	54.8	55.8	56.3	55.6	56.9	57.4	58.4	59.2	60.2
11	51.0	50.1	50.9	52.0	52.5	51.7	53.1	53.7	54.7	55.6	56.6
12	47.4	46.5	47.3	48.4	49.0	48.1	49.5	50.2	51.2	52.1	53.2
13	44.1	43.2	44.0	45.1	45.7	44.8	46.2	46.9	47.9	48.8	50.0
14	41.0	40.1	40.9	42.0	42.6	41.8	43.1	43.9	44.9	45.8	47.0
15	38.1	37.2	38.0	39.2	39.8	38.9	40.3	41.0	42.0	43.0	44.2
16	35.5	34.5	35.3	36.5	37.1	36.2	37.6	38.3	39.3	40.3	41.5
17	33.1	32.1	32.8	34.0	34.6	33.7	35.1	35.8	36.8	37.8	39.0
18	30.8	29.8	30.5	31.7	32.3	31.4	32.8	33.5	34.5	35.5	36.7
19	28.7	27.7	28.4	29.6	30.2	29.2	30.7	31.4	32.3	33.4	34.6
20	26.8	25.7	26.4	27.6	28.2	27.2	28.6	29.4	30.3	31.4	32.6

Tissue-Air Ratios for Rectangular Fields

Cobalt-60

d (cm)	0×0	4×4	4×6	4×8	4×10	4×15	5×5	6×6	6×8	6×10	6×15	7×7	8×8	8×10
*0.5	1.000	1.015	1.018	1.020	1.022	1.025	1.018	1.022	1.025	1.027	1.031	1.025	1.029	1.032
1	.965	.996	1.001	1.005	1.008	1.012	1.003	1.009	1.014	1.018	1.023	1.015	1.021	1.025
2	.905	.956	.965	.970	.973	.978	.967	.976	.983	.988	.994	.985	.992	.997
3	.845	.915	.926	.932	.936	.942	.928	.940	.948	.954	.961	.950	.959	.966
4	.792	.872	.885	.893	.897	.903	.888	.902	.912	.918	.926	.914	.924	.931
5	.742	.829	.843	.852	.856	.863	.847	.862	.873	.880	.889	.875	.887	.895
6	.694	.786	.801	.810	.815	.823	.805	.821	.833	.840	.851	.835	.847	.856
7	.650	.743	.758	.767	.773	.781	.762	.778	.791	.799	.810	.793	.807	.819
8	.608	.700	.715	.725	.731	.740	.719	.736	.749	.757	.769	.751	.765	.775
9	.570	.659	.674	.684	.689	.700	.677	.695	.708	.716	.730	.710	.724	.734
10	.534	.620	.635	.644	.650	.661	.638	.655	.668	.677	.691	.671	.685	.695
11	.501	.581	.596	.606	.612	.623	.600	.616	.630	.639	.652	.632	.647	.658
12	.469	.546	.560	.570	.576	.587	.563	.580	.594	.603	.617	.596	.611	.622
13	.440	.513	.527	.537	.544	.555	.530	.547	.561	.570	.584	.563	.578	.589
14	.412	.482	.496	.505	.512	.523	.499	.515	.528	.538	.552	.531	.545	.557
15	.386	.454	.467	.476	.483	.494	.470	.485	.498	.507	.522	.501	.515	.526
16	.361	.427	.440	.449	.455	.466	.443	.458	.470	.479	.494	.472	.485	.496
17	.338	.402	.414	.423	.429	.440	.417	.431	.443	.452	.467	.445	.458	.469
18	.317	.378	.390	.398	.404	.415	.393	.406	.418	.426	.441	.420	.433	.443
19	.297	.355	.366	.375	.381	.391	.369	.383	.394	.403	.417	.396	.409	.420
20	.278	.333	.344	.353	.358	.369	.347	.361	.372	.380	.394	.374	.386	.396
22	.246	.293	.304	.312	.317	.327	.306	.318	.328	.336	.350	.330	.342	.352
24	.215	.258	.268	.275	.280	.290	.270	.281	.290	.298	.311	.292	.303	.312
26	.187	.228	.236	.243	.248	.257	.238	.249	.258	.264	.277	.259	.270	.278
28	.164	.200	.210	.215	.219	.229	.210	.221	.228	.234	.246	.230	.239	.246
30	.144	.178	.185	.190	.194	.202	.186	.195	.202	.208	.218	.203	.212	.219

d (cm)	8×15	8×20	10×10	10×15	10×20	12×12	15×15	15×20	20×20	20×30	25×25	30×30	35×35
*0.5	1.037	1.041	1.035	1.042	1.046	1.041	1.051	1.056	1.063	1.071	1.073	1.080	1.084
1	1.032	1.035	1.031	1.038	1.043	1.038	1.048	1.054	1.062	1.069	1.072	1.079	1.084
2	1.005	1.009	1.004	1.013	1.018	1.014	1.025	1.032	1.040	1.049	1.052	1.059	1.065
3	.975	.980	.974	.985	.990	.985	.999	1.006	1.016	1.026	1.029	1.038	1.044
4	.942	.947	.940	.952	.959	.953	.968	.977	.987	.999	1.002	1.014	1.021
5	.907	.913	.905	.918	.925	.919	.936	.946	.957	.971	.974	.988	.998
6	.869	.876	.867	.882	.890	.883	.902	.912	.925	.940	.944	.959	.970
7	.830	.837	.827	.844	.853	.845	.866	.878	.893	.909	.913	.929	.941
8	.790	.798	.787	.805	.815	.806	.830	.843	.859	.877	.881	.899	.912
9	.751	.760	.747	.767	.778	.768	.793	.808	.825	.845	.849	.869	.882
10	.713	.722	.709	.729	.741	.730	.756	.771	.790	.811	.816	.837	.852
11	.675	.685	.672	.692	.704	.692	.719	.736	.755	.777	.782	.803	.820
12	.640	.650	.636	.657	.670	.658	.685	.702	.722	.744	.750	.772	.790
13	.607	.618	.603	.625	.638	.626	.653	.670	.690	.713	.720	.743	.762
14	.575	.586	.571	.593	.606	.594	.622	.639	.660	.684	.691	.715	.734
15	.545	.556	.540	.563	.576	.563	.593	.610	.633	.656	.662	.687	.706
16	.516	.527	.510	.533	.547	.533	.564	.582	.605	.628	.634	.660	.679
17	.488	.499	.483	.506	.519	.506	.536	.554	.577	.601	.608	.633	.653
18	.462	.474	.457	.479	.493	.479	.509	.528	.551	.575	.582	.607	.627
19	.438	.449	.433	.455	.469	.455	.485	.503	.526	.550	.557	.583	.603
20	.415	.426	.410	.431	.445	.431	.461	.479	.502	.527	.534	.560	.580
22	.369	.380	.364	.385	.398	.384	.413	.431	.456	.481	.488	.515	.535
24	.329	.340	.324	.345	.358	.345	.373	.390	.412	.438	.446	.471	.492
26	.294	.304	.290	.309	.322	.308	.336	.352	.373	.396	.405	.431	.451
28	.263	.270	.257	.276	.288	.276	.302	.320	.339	.362	.368	.393	.413
30	.233	.242	.228	.245	.257	.244	.268	.286	.305	.328	.335	.358	.377