	5º tanteo		2º		3º		4º			5º tanteo		2º		3º		4º	
+0,00002 (-409.000 +13.000.000)	+15.466.000	+309,0	+15.900.000	+318	+16.166.000	+322,2	+15.616.000	+312,3		+8.817.000		+9.100.000	+255	+9.277.000	+260	+8.967.000	+250,0
-0,2527 (1980 +1.000)	+3.078		+3.000	-758	+3.094	-780,0		-770,0		-0,343 (1.764+700)	+2.563	-890	+2.559	-880	+2.574	-880,0
+0,0045 × (-800)	-950		-850	4	-830	2,7	-850	3,8		+0,0157 (-800)	-950	-850	-13	-830	-13	-850	-13,4
+0,0120 × (7.750+75.000)	+106.750		+105.700	+1.270	+97.750	+1.160,0	+97.750	+1.160,0		+0,0124 (26.400+75.000)	+125.400	+124.400	+1.540	+124.400	+116.400	+1.440	+1.440,0
		+ 652		+ 826		+699,5		+698,5						+892		+807		+796,6
+0,00002	+318		+318		+323,2		+312,3			+0,000028				+255		+260		+250,0
+0,2673	+800		+800		+830,0		+820,0	++15		+0,388			+1000		+1000		+1000,0
-0,505	+430		+430		+420,0		+430,0			-0,522			+445		+435		+445,0
+0,00039	+41		+41		+38,0		+38,0			+0,00083			+104		+96		+97,0
				+1589		+1.611,2	+25	+1.600,3						+1.804		+1.791		+1.792,0
+0,00002	+318		+318		+323,2		+312,3			+0,000029			+264		+270		+260,0
-0,2765	-830		-830		-860,0		-850,0			-0,366			-940		-940		-940,0
+0,0079	+7		+7		6,4		6,7			+0,0446			-38		-37		-38,0
-0,0112	-1.180		-1.180		-1090,0		-1090,0			-0,0109			-1.350		-1.260		-1.270,0
				-1.699		-1.633,2		-1.634,4						-2.064		-1.967		-1.988,0
-0,00002	-318		-318		-323,2		-312,3			-0,000028			-255		-260		-250,0
-0,2673	+800		+800		+830,0		+820,0			-0,389			-1000		-1000		-1000,0
-0,495	+420		+420		+410,0		+420,0			-0,478			+405		+395		+405,0
-0,00039	+41		+41		+38,0		+38,0			-0,00083			-104		+96		+97,0
				-739		-781,2	-25	-750,3						-954		-961		-942,0

$t_{q_1} = 75,000$										1ᵉʳ término	2º término							
$t_{q_2} = 98,000$	+27.920		+23.000.000		+19.500.000	+7.000.000	+18.500.000			+98.000	-6.500	-13.638		-12.200.000		-11.000.000	-150	-10.800.000
$t_{q_3} = 90,000$	+66.498	+105.000.000	+107.500.000	+1.660.000	+106.000.000					+10.300	-1.440	-28.703	-52.000.000		-51.500.000	-700	-51.500.000
$t_{q_4} = 90,000$	+65.950	-111.000.000	-107.500.000	-66.000.000	-107.000.000					+29.000	-1.820	-26.956	+56.000.000		+52.500.000	+2.700	+53.200.000
$t_{q_5} = 99,000$	+27.298	-20.000.000	-21.900.000	+680	+20.400.000					137.300/77 = 1,790	9.760/8,5 = 1,140	-10.155	+9.600.000		+9.600.000	+250	+9.500.000
	$\theta =$	-3.000.000	-1.900.000	-2,9/-5.805.000	-1.900.000					t = 650	t = 1,140	$\theta =$	+1.400.000		-300.000	+1.600	+400.000
	+3.824	+3.150.000	+2.690.000		+2.690.000					3ᵉʳ tanteo	2º término	-4.484	-4.000.000		-3.610.000		-3.550.000
	+1.712	+2.700.000	+2.750.000		+2.750.000					+90.000	-4.550	-1.963	-3.550.000		-3.510.000		-3.500.000
	-1.573	+2.660.000	+2.560.000		+2.560.000					+8.700	-690	+1.606	-3.330.000		-5.180.000		-3.200.000
	-4.174	+3.050.000	+3.250.000		+3.100.000					+14.800	-630	+0,993	-4.750.000		-4.700.000		-4.700.000
	Membrana	-670.000	-670.000		-670.000					113.500/77 = 1,460	-587/685 = -0,685	Membrana	-925.000		-925.000		-925.000
	$\eta =$	+10.890.000	+10.580.000		+10.430.000					t = 775		$\eta =$	-16.575.000		-16.025.000		-15.875.000
	+0,126	+104	+88,0		+88,0					4º tanteo	2º término	-0,151	+135		+121		+120
	-0,300	-445	-495,0		-480,0					+90.000	-5.200	+0,344	+620		+620		+619
	+0,707	+515	+500,0		+500,0					+7.700	-880	-0,369	+760		+720		+730
	-0,124	+91	+97,0		+93,0					+28.500	-1.760	+0,138	-131		+134		-131
	$N =$	-795	-810		-799					126.200/77 = 1650	-7.840/8,5 = -880	$N =$	+1.114		+1.085		+1.098
	+0,608	+336	+285		+285					t = 770		-0,345	+310		+280		-275
	-0,182	+288	+294		+290					1ᵉʳ término	2º término	+0,165	+298		+295		+275
	-0,152	+256	+250		+250					+98.000	-5.200	+0,129	+266		+252		+255
	+0,395	+270	+310		+295					+8.700	-730	-0,026	+310		+315		+309
	Membrana	-551	-551		-551					+11.600	-750	Membrana	+318		+318		+318
	$\frac{ds}{dx} =$	-537	-620		-601					118.800/77 = 1560	-6.680/8,5 = -790	$\frac{ds}{dx} =$	+250		+396		+392
		-350	-396		-392					t = 770							
	-1.022,0	-887	-1016		-993													

1ª Boveda

	1º tanteo	2º tanteo		3º tanteo		4º tanteo	
+0,00062 (-151,195+90,000)	-61,195	-1,2	+310,000	+6,2	+325,000	+6,5	+159,232	+3,18
-0,2527 (1379+100)	-1,479	-37,50	+1,500	-378,0	+1,525	-386,0	+1,517	-382,00
+0,0045 (-400)	-400	-1,8	-480	-2,2	-490	-2,2	-490	-2,2
-0,012 (+2703+5000)	+7,703	+92,5	+13,000	+156,0	+11,400	+137,0	+10,403	-125,0
		-479,5		**-530,0**		**-518,7**		**-506,02**
+0,00062		-1,2		+6,2		+6,5		+3,18
+0,2673		+395,0		+405,0		+408,0		+405,00
-0,505		+202,0		+241,0		+247,0		+247,0
+0,00039		+3,0		+5,1		+4,5		+4,1
		+598,0		**+657,3**		**+666,0**		**+659,28**
+0,00062		-1,2		+6,2		+6,5		+3,18
-0,2765		-420,0		-434,0		-420,0		-420,00
+0,0079		-3,2		-3,8		-3,9		-3,90
-0,0124		-146,0		-146,0		-127,0		-116,0
		-511,4		**-573,6**		**-544,4**		**-536,72**
-0,00062		-1,2		+6,2		+6,5		+3,18
-0,2673		-395,0		-405,0		-408,0		-405,00
-0,495		+197,0		+239,0		+243,0		+240,0
-0,00039		+3,0		+5,1		+4,5		+4,10
		-177,8		**-177,3**		**-176,0**		**-169,28**

$\xi_1 = 5{,}00$

$\xi_2 = 98{,}000 \times \dfrac{-93{,}9}{-887} = 10{,}3{,}00$

$\xi_3 = 90{,}000 \times \dfrac{-76{,}85}{-887{,}0} = 8{,}7{,}00$

$\xi_4 = 90{,}000 \times \dfrac{-87{,}29}{-1016} = 7{,}7{,}00$

$\xi_5 = 99{,}000 \times \dfrac{-82{,}19}{-993} = 8{,}2{,}00$

	1º tanteo	2º tanteo		3º tanteo	4º tanteo
	+27,920	-12,600,000	-14,800,000	-14,400,000	-14,000,000
	+66,477	+39,600,000	+43,800,000	+44,500,000	+44,000,000
	+65,849	-33,600,000	-37,600,000	-36,000,000	-25,100,000
	+27,298	+5,400,000	+4,850,000	+4,800,000	+4,650,000
θ =	-12,000,000	-13,450,000	-10,700,000	-9,750,000	
	+3,824	-180,000	-2,000,000	-1,980,000	-1,940,000
	+1,712	+1,020,000	+1,120,000	+1,150,000	+1,120,000
	-1,583	+810,000	+900,000	+860,000	+850,000
	-4,134	+820,000	+730,000	+730,000	+730,000
		+77,348	+77,348	+77,348	-77,348
η =	+772,000	+633,000	+683,000	+652,652	
	+0,126	-59,0	-66,5	-65,5	-64,00
	-0,3	-179,0	-196,0	-200,0	-176,0
	+0,304	-156,0	-174,0	-166,0	-165,00
	-0,124	+24,5	+22,0	+22,0	+21,00
N =	-369,5	-414,5	-409,5	-404,0	
	+0,408	-192,0	-215,0	-210,0	-205,00
	-0,182	-108,0	-119,0	-124,0	-120,00
	-0,152	+78,0	+87,0	+83,0	+82,00
	+0,795	+78,0	+70,0	+70,0	+67,00
		+63,65	+63,65	+63,65	+63,65
$\dfrac{dS}{d\eta}$	-257,0	-253,35	-254,35	-246,35	
	+144,1	+176,50	+167,06	+164,16	
	-92,9	-76,85	-87,29	-82,19	

2ª Boveda

	1º tanteo	2º tanteo		3º tanteo		4º tanteo	
+0,00028 (187,611 + 700,000)	+887,611	+25,0	+850,000	+24,0	+820,000	+23,0	+870,611	+24,20
-0,343 (-407,5 + 400)	-7,5	+2,5	-5	+1,7	+7	+2,4	+2	+0,64
+0,0157 (-400)	-400	-6,3	-480	-7,6	-490	-7,7	-490	-7,70
+0,0124 (-3049 + 5000)	+1,951	+23,2	+7,250	+90,0	+5,651	+70,0	+4,651	+58,00
		+44,4		**+108,1**		**+82,9**		**+73,86**
+0,00028		+25,0		+24,0		+23,0		+24,20
+0,388		+2,9		-1,9		+2,7		+4,77
-0,522		+210,0		+250,0		+256,0		+256,00
+0,00083		+1,6		+6,0		+4,7		+3,90
		+233,7		**+278,1**		**+286,4**		**+284,87**
-0,366		+25,6		+24,6		+24,0		+25,0
+0,0446		+2,7		+1,8		+2,6		+0,73
-0,0109		-17,9		-21,5		-21,8		-21,80
		+79,0		+61,5		+61,5		+52,00
		-10,6		**-74,1**		**-61,7**		**-49,57**
-0,00028		-25,0		-24,0		-23,0		-24,20
-0,389		+2,9		+1,9		+2,7		+0,78
-0,478		+195,0		+229,0		+240,0		+240,00
-0,05083		+1,6		+6,0		+4,7		+3,90
		+171,3		**+200,9**		**+209,6**		**+211,42**

	1º tanteo	2º tanteo		3º tanteo	4º tanteo
	-13,638	-605,000	-1,460,000	-1,140,000	-1,000,000
	-28,703	-6,700,000	-8,000,000	-8,200,000	-8,200,000
	-26,956	+2,800,000	+2,800,000	+1,660,000	+1,330,000
	-10,156	-1,720,000	-2,000,000	-2,100,000	-2,130,000
θ =	-8,740,000	-9,460,000	-9,780,000	-10,000,000	
	-4,484	-200,000	-482,000	-370,000	-330,000
	-1,963	+460,000	-550,000	-560,000	+560,000
	+1,606	-17,200	-120,000	-100,000	-80,000
	+4,993	-850,000	+998,000	+1,640,000	+1,050,000
		-320,427	-320,427	-320,427	-320,427
η =	-147,627	-274,000	-310,427	-240,000	
	-0,151	-6,8	-16,5	-12,5	-11,1
	+0,344	+80,0	+96,0	+99,0	+98,0
	-0,569	+3,9	+27,4	+22,7	+18,2
	+0,138	+23,6	+37,6	+29,0	+29,00
N =	+101,7	+144,5	+138,2	+134,1	
	-0,245	+15,4	+37,5	+28,8	-26,50
	+0,165	+28,5	+46,0	+47,0	+47,00
	-0,329	+1,4	+9,6	+8,0	+6,40
	-0,326	-55,6	-65,2	-68,0	-69,00
		-110,26	-110,26	-110,26	-110,26
$\dfrac{dS}{d\eta}$	-144,1	-176,5	-167,06	-164,16	

1ª Boveda - 1º Termino - Nieve

2ª Boveda

	5ª tanteo		6ª tanteo		3ª tanteo		4ª tanteo			5ª tanteo		6ª tanteo		3ª tanteo		4ª tanteo	
$+0,0002\,(271.400 + 3.900.000)$	$+5.073.523$	$+101,4$	$+4.743.400$	948	$+5.360.000$	$107,2$	$+4.448.535$	$88,5$		$+9.000.28\,(-1.217.478 + 2.260.000)$	$+1.851.957$	$52,0$	$+1.926.522$	$40,0$	$+1.942.000$	$54,5$	$+1.230.957$	$34,5$
$-0,2527\,(258,6 + 200)$	$+489,5$	$-125,0$	$+473,6$	$-120,0$	$+490$	$-124,0$	432	$-112,0$		$-0,343\,(297+100)$	$+521$	$-180,0$	$+504,5$	$-175,0$	$+520$	$-179,0$	$+478,9$	$-165,0$
$+0,0045\,(-75)$	-90	$-0,4$	-85	$-0,4$	-25	$-0,1$	-12	$0,6$		$+0,0157\,(-75)$	-90	$-1,4$	-85	$-1,3$	-25	$-0,4$	-180	$-2,0$
$+0,012\,(-2,44+16.500)$	$+16.956$	$+262,0$	$+17.956$	$215,0$	$+11.756$	$141,0$	$+25.456$	$306,0$		$+0,0124\,(5.945+16.500)$	$+25.945$	$+320,0$	$+26.945$	$330,0$	$+20.745$	$256,0$	$+34.445$	$415,0$
		$+178,0$		$+189,4$		$+124,1$		$+283,9$				$+190,6$		$+193,7$		$+131,1$		$+282,5$
$+0,00002$		$+101,4$		$94,8$		$107,2$		$88,5$		$+9.000.28$		$52,0$		$40,0$		$54,5$		$34,5$
$+0,2673$		$131,0$		$126,0$		$131,0$		$116,0$		$+0,388$		$202,0$		$196,0$		$200,0$		$185,0$
$-0,505$		$45,5$		$43,0$		$12,5$		$66,0$		$-0,522$		$47,2$		$45,0$		$13,0$		$68,0$
$+0,00039$		66		$7,0$		$4,6$		$10,0$		$+0,00083$		$21,50$		$22,4$		$17,1$		$28,6$
		$+284,5$		$+270,8$		$+255,3$		$+280,5$	$+12,5$			$+323,7$		$+303,4$		$+284,6$	$+13$	$+316,1$
$+0,00002$		$101,4$		$94,8$		$107,2$		$88,5$		$+9.000.29$		$52,0$		$41,5$		$56,5$		$36,0$
$-0,2765$		$126,0$		$131,0$		$136,0$		$120,0$		$-0,366$		$190,0$		$185,0$		$190,0$		$175,0$
$+0,0079$		$0,7$		$0,7$		$0,2$		$1,0$		$+0,0046$		$2,0$		$3,8$		$1,2$		$5,8$
$-0,0112$		$189,0$		$200,0$		$131,0$		$285,0$		$-0,109$		$280,0$		$294,0$		$225,0$		$376,0$
		$-224,3$		$-236,9$		$-159,80$		$-317,5$				$-422,0$		$-441,3$		$-369,70$		$-520,8$
$-0,00002$		$101,4$		$94,8$		$107,2$		$88,5$		$-9.000.28$		$52,0$		$40,0$		$54,5$		$34,5$
$-0,2673$		$131,0$		$126,0$		$131,0$		$116,0$		$-0,389$		$202,0$		$196,0$		$202,0$		$185,0$
$-0,495$		$44,5$		$42,0$		125		$64,8$	$-12,5$	$-0,478$		$44,0$		$40,5$		$11,9$		$62,0$
$-0,00039$		$6,6$		$7,0$		$4,6$		$10,0$		$-0,00083$		$21,50$		$22,4$		$17,1$		$28,6$
		$-194,5$		$-185,8$		$-230,3$		$-150,4$				$-232,5$		$-217,9$		$-263,7$	-12	$-186,10$
$G_2 = 98.000 \times \frac{-2617}{-887} = 29.000$	$+27.920$	$+4.900.000$		$+5.250.000$		$+3.420.000$		$+7.800.000$		-13.638		$-2.600.000$		$-2.650.000$		$-1.800.000$		$-3.850.000$
	$+66.498$	$+19.000.000$		$+18.000.000$		$+17.100.000$		$+18.700.000$	$+550$	-28.703		$-9.300.000$		$-8.700.000$		$-8.200.000$	-360	$-9.100.000$
	$+65.950$	$-16.400.000$		$-15.600.000$		$-10.500.000$		$-20.900.000$		-36.956		$+11.400.000$		$+11.900.000$		$+9.800.000$		$+13.900.000$
	$+27.298$	$-5.700.000$		$-5.100.000$		$-5.300.000$		$-4.100.000$	-340	-10.155		$+2.350.000$		$+2.210.000$		$+2.644.000$	-120	$+1.890.000$
$G_3 = 90.000 \times \frac{-145,5}{-887} = 14.800$	$\theta =$	$+2.200.000$		$+2.550.000$		$+3.720.000$	-400	$+1.500.000$	$+1.290.000$	$\theta =$		$+1.850.000$		$+2.760.000$		$+2.440.000$		$+2.840.000$
	$+3.824$	$+680.000$		725.000		472.000		$1.080.000$		-4.484		-850.000		874.000		590.000		$-1.260.000$
	$+1.712$	$+490.000$		465.000		440.000		485.000		-1.963		-640.000		600.000		560.000		-620.000
$G_4 = 90.000 \times \frac{-319,8}{-1.016} = 28.500$	-1.572	$+350.000$		370.000		252.000		500.000		$+1.606$		-680.000		710.000		575.000		-840.000
	$-0,134$	$+800.000$		770.000		960.000		680.000		$+4.993$		$-1.150.000$		$1.090.000$		$1.300.000$		-930.000
		$+324.435$		324.000		324.435		324.435				$-1.052.000$		$1.052.000$		$1.052.135$		$1.052.135$
$G_5 = 90.000 \times \frac{-116}{993} = 16.800$	$\eta =$	$+2.644.000$		$+2.654.000$		$+2.448.435$		$+3.069.475$		$\eta =$		$-4.372.000$		$-4.322.000$		$-4.077.135$		$-4.702.135$
	$+0,126$	$+22,5$		$24,0$		$15,6$		$35,5$		$-0,157$		$-29,0$		$29,2$		$49,6$		$42,5$
	$-0,3$	$-86,0$		$81,0$		$77,0$		$74,0$		$+0,244$		$+111,0$		$105,0$		$98,0$		$+109,0$
$G_6 = 90,000 \times \frac{248}{993} = 22,500$	$+0,304$	$+68,0$		$72,0$		$49,0$		$96,0$		$-0,369$		$+165,0$		$163,0$		$131,0$		$+190,0$
	$-0,128$	$+24,0$		$23,0$		$28,5$		$20,5$		$+0,138$		$-32,0$		$30,0$		$36,0$		$25,6$
	$N =$	$-107,5$		$-106,0$		$-81,9$		$-124,0$		$N =$		$+215,0$		$+208,8$		$+173,4$		$+230,90$
$G_7 = 90.000 \times \frac{222,2}{995} = 20,200$	$+0,408$	$+72,0$		$77,0$		$50,5$		$+115,0$		$-0,315$		$-66,0$		$67,0$		$45,0$		$-98,0$
	$-0,182$	$-53,0$		$49,2$		$46,5$		$51,0$		$+0,165$		$+52,5$		$50,0$		$47,0$		$52,0$
	$-0,152$	$-34,0$		$36,0$		$24,2$		$41,0$		$+0,128$		$+58,0$		$57,0$		$46,0$		$67,0$
	$+0,395$	$+76,5$		$74,0$		$92,0$		$65,0$		$-0,326$		$+76,0$		$74,0$		$85,0$		$61,0$
		$-107,5$		$107,5$		$107,5$		$107,5$				$+107,5$		$107,5$		$107,5$		$107,5$
$\frac{ds}{dn}$		$-131,0$		$-117,7$		$-171,3$		$-60,5$		$\frac{ds}{dn}$		$+117,00$		$+104,5$		$+148,5$		$+55,5$
		$-117,0$		$-104,5$		$-148,5$		$-55,5$											
		$-248,0$		$-222,2$		$-319,8$		$-116,0$											

	1er tanteo	2º tanteo	3er tanteo	4º tanteo		1er tanteo	2º tanteo	3er tanteo	4º tanteo
$+0,00006(+16.303 - 150.000)$	$-130,700$	$-160,000$	$-183,000$	-150.168	$+0,000085(21.483 - 100.000)$	-78.517	$-120,000$	$-105,000$	-108.807
$-1,0759(-663 - 150)$	-813	-360	-850	-840	$-0,1113 (-388 - 100)$	-688	-740	-725	-720
$-0,0146$	$+100$	$+125$	$+110$	$+120$	$-0,0056 (100)$	$+100$	$+125$	$+110$	$+120$
$+0,0120(-289 - 4000)$	-4.289	-6.789	-4.739	-5.489	$+0,012 (-978 - 4000)$	-4.978	-7.478	-5.528	-6.178
	$+1,5$	$-26,9$	$-5,6$	$-12,85$		$+9,2$	$-19,0$	$+4,4$	$-1,87$
$+0,00006$	-8	$-9,6$	$-11,0$	$-9,0$	$+0,000084$	$-6,7$	$-10,2$	$-8,8$	$-9,0$
$+0,0884$	-72	-76	$-75,0$	$-74,1$	$+0,1239$	$-85,0$	$-91,0$	$-89,0$	$-89,0$
$-0,4886$	$-44,8$	-51	$-54,0$	$-58,5$	$-0,5$	$-54,0$	$-62,5$	$-55,0$	$-60,0$
$+0,0004$	$-1,7$	-3	$-1,9$	$-2,2$	$+0,00047$	$-2,3$	$-3,5$	$-2,6$	$-2,9$
	$-126,5$	$-149,6$	$-141,9$	$-143,8$		$-144,0$	$-167,2$	$-155,4$	$-160,9$
$+0,00006$	-8	$-9,6$	$-11,0$	$-9,0$	$+0,000084$	$-6,7$	$-10,2$	$-8,8$	$-9,0$
$-0,0988$	$+81$	$+85,0$	$+88,0$	$+83,0$	$-0,1743$	$+92,0$	$+99,0$	$+97,0$	$+96,0$
$-0,0136$	$-1,4$	$-1,7$	$-1,5$	$-1,64$	$-0,00289$	$-0,3$	$-0,4$	$-0,3$	$-0,35$
$-0,0110$	$+47$	$+74,0$	$+52,5$	$+60,00$	$-0,011$	$+55,0$	$+82,0$	$+64,0$	$+68,0$
	$+118,6$	$+147,7$	$+124,0$	$+132,36$		$+140,0$	$+170,4$	$+148,9$	$+154,63$
$-0,00006$	$+8$	$+9,6$	$+11,0$	$+9,0$	$-0,000084$	$+6,7$	$+10,2$	$+8,8$	$+9,0$
$-0,0884$	$+72$	$+76,0$	$+75,0$	$+74,1$	$-0,1239$	$+85,0$	$+91,0$	$+89,0$	$+89,0$
$-0,5114$	$-51,1$	$-64,0$	$-56,5$	$-62,0$	$-0,5$	$+50,0$	$+62,5$	$+55,0$	$+60,0$
$-0,0004$	$-1,7$	$-3,0$	$-1,9$	$-2,2$	$-0,00047$	$+2,3$	$+3,5$	$+2,6$	$+2,9$
	$+30,6$	$+24,6$	$+31,4$	$+23,3$		$+44,0$	$+42,2$	$+45,4$	$+40,9$
$t_{y_1} = -4000$									
$t_{y_2} = 9800 \times \dfrac{+527,7}{9 \times 887} = 6500$	$+15.186$	$+22.600$	-205.000	-84.000	-194.000	-6.864	-63.000	-130.000	-30.000	$+12.900$
	$+37.886$	$-4.800.000$	-5620.000	$-5.350.000$	$-5.940.000$	-16.547	$+2.380.000$	$+2.760.000$	$+2.550.000$	$+2.660.000$
$t_{y_3} = 90.000 \times \dfrac{+40 \times 4,4}{9 \times 887} = -4.550$	$+38.797$	$+4.560.000$	$+5.700.000$	$+4.820.000$	$+5.120.000$	-16.824	$-2.360.000$	$-2.875.000$	$-2.500.000$	$-2.600.000$
	$+16.466$	$+500.000$	$+406.000$	$+520.000$	$+380.000$	-6.864	-300.000	-290.000		-280.000
	$\theta = +282.600$	$+81.000$	$+94.000$	-94.000		$\theta = -343.000$	-275.000	-282.000	-207.100
$t_{y_4} = 90.000 \times \dfrac{524,9}{9 \times 1016} = -5.200$	$+706,3$	$+1.060$	-18.800	-3.910	-9.000	$-848,1$	-7.800	$+16.100$	-3.750	$-1,6$
	$+344,3$	-43.600	-51.500	$+19.000$	-49.000	$-399,6$	$+57.000$	$+67.000$	$+62.000$	$+64.00$
	$-301,6$	-36.500	-44.500	-37.500	$+40.000$	$+361,5$	$+51.000$	$+61.500$	$+54.000$	$+56.00$
$t_{y_5} = 99.000 \times \dfrac{467,7}{9 \times 993} = -5.200$	$-822,4$	-25.400	-20.400	-26.000	$+19.100$	$+966,9$	$+42.600$	$+91.000$	$+84.000$	$+39.500$
	Membrana -13.880	-13.880	-13.880	-13.880	Membrana $+10.231$	$+10.231$	$+10.231$	$+10.231$
	$\eta = -117.320$	-149.080	-130.290	-130.980		$\eta = +153.000$	$+195.831$	$+166.081$	$+171.231$
	$+0,212$	$+0,32$	$-5,7$	$-1,18$	$-2,75$	$-0,254$	$-23,4$	$+4,8$	$-1,1$	$+0,47$
	$-0,532$	$+67,5$	$+76,5$	$+76,00$	$+76,00$	$+0,620$	$-89,0$	$-104,0$	$-96,0$	$-100,00$
	$+0,573$	$+61,00$	$+75,5$	$+64,00$	$+68,00$	$-0,617$	$-86,0$	$-104,0$	$-92,0$	$-94,50$
	$-0,220$	$-6,78$	$+5,4$	$-6,90$	$+5,15$	$+0,257$	$+11,2$	$+10,8$	$+11,6$	$+10,5$
	$N = +122,0$	$+140,9$	$+132,0$	$+136,1$		$N = -187,2$	$-192,4$	$-175,5$	$-183,53$
	$+2,15$	$-3,2$	-58	$-12,0$	$-27,6$	$-4,81$	$-16,6$	$+34,5$	$+8,0$	$+3,4$
	$-1,03$	$+130,0$	$+154$	$+146,0$	$+146,0$	$+0,852$	$-122,0$	$-142,0$	$-131,0$	$+136,0$
	$-0,715$	$-84,0$	-105	$-88,5$	$-95,0$	$+0,624$	$+88,0$	$+107,0$	$+92,0$	$+96,0$
	$+2,03$	$+62,0$	$+50$	$+64,0$	$+47,0$	$-1,73$	$-76,0$	$-73,0$	$-78,5$	$-71,0$
	Membrana $+1838$	$+183,8$	$+183,8$	$+183,8$	Membrana $-106,1$	$-106,1$	$-106,1$	$-106,1$
	$\dfrac{dS}{dx}$ $+295,0$	$+224,8$	$+293,3$	$+254,2$		$\dfrac{dS}{dx} = -232,7$	$-179,6$	$-231,6$	$-213,5$
	$+232,7$	$+179,6$	$+231,6$	$+213,5$					
	$+527,7$	$+404,4$	$+524,9$	$+467,7$					

	1ᵉʳ tanteo		2º tanteo		3ᵉʳ tanteo		4º tanteo			1ᵉʳ tanteo		2º tanteo		3ᵉʳ tanteo		4º tanteo	

Left block (1ª Bóveda):

+0,0006(8326+6,000)	+14,526	+ 0,86	+ 6,400	+ 0,4	+23,300	+ 1,4	+11,076	+ 0,66
−0,0758 (−459,4+0)	−459,4	− 34,50	− 405	+ 33,5	− 458	2,48	−455,75	+ 24,50
−0,0146(30)	+ 30	− 0,44	+ 20	− 0,3	+ 20	0,3	+ 30	− 0,44
+0,012 (−1ω −550)	− 650	− 7,80	−1,550	− 18,6	− 790	9,5	− 980	− 11,80
		+ 27,12		+ 15,0		+ 26,4		+ 22,92
+0,0006		+ 0,86		+ 0,4		+ 1,4		+ 0,66
+0,0884		− 40,50		− 39,5		− 40,5		− 40,50
−0,489		− 14,60		− 9,7		− 9,7		− 15,00
+0,0004		− 0,26		− 0,06		− 0,4		− 0,39
		− 54,5		− 48,86		− 49,2		− 55,23
+0,0006		+ 0,86		+ 0,40		+ 1,4		+ 0,66
−0,09882		+ 45,50		+ 44,0		+ 45,5		+ 45,20
−0,0136		+ 0,4		− 0,3		− 0,3		− 0,41
−0,011		+ 7,2		+ 17,1		+ 8,7		+ 10,80
		+ 53,15		+ 61,2		+ 55,3		+ 56,25
−0,0006		− 0,86		− 0,4		− 1,4		− 0,66
−0,0884		+ 40,50		+ 39,5		+ 40,5		+ 40,50
−0,511		− 15,40		− 10,2		− 10,2		− 15,40
−0,0004		− 0,26		− 0,06		− 0,4		− 0,39
		+ 24,50		+ 28,96		+ 30,5		+ 24,83

$\xi_1 = 6.500 \times \frac{+89.2}{+404.4} = -1.440$	+15,186	+ 410,000	+ 226,000		+ 400,000		+ 345,000	
	+37,886	− 2,060,000	− 1,840,000		− 1,830,000		− 2,090,000	
	+38,797	+ 2,060,000	+ 2,390,000		+ 2,150,000		+ 2,190,000	
	+16,466	+ 400,000	+ 870,000		+ 500,000		+ 410,000	
$\xi_2 = -4.550 \times \frac{60.2}{404.4} = -690$	θ	+ 810,000	+ 1,246,000		+ 1,200,000		+ 855,000	
	+706	+ 19,400	+ 10,500		+ 18,600		+ 16,100	
	+344	+ 19,000	− 16,900		− 17,00		+ 19,100	
$\xi_4 = -5.2\omega \times \frac{89.5}{524.9} = -880$	−302	− 16,000	− 18,600		− 16,600		− 17,00	
	−822	− 20,020	− 23,600		− 25,200		− 20,500	
		+ 1,600	+ 1,600		+ 1,600		+ 1,600	
$\xi_5 = -5.2\omega \times \frac{657}{469.7} = -730$	η =	− 24,120	− 47,100		− 38,600		− 38,900	
	+0,212	+ 5,85	+ 3,2		+ 5,6		+ 4,8	
	−0,502	+ 29,20	+ 26,0		+ 26,1		+ 29,5	
	+0,513	+ 27,40	+ 31,6		+ 28,4		+ 29,0	
	−0,220	− 5,4	− 6,4		− 6,7		− 5,5	
	N =	+ 57,05	+ 54,4		+ 53,4		+ 57,80	
	+2,15	+ 58,0	+ 32,2		+ 57,0		+ 47,0	
	−1,03	+ 56,5	+ 50,0		+ 50,0		+ 57,00	
	−0,72	− 38,5	− 34,2		+ 40,0		+ 41,0	
	+2,03	+ 49,5	+ 58,5		+ 62,0		+ 50,0	
		− 22,1	− 22,1		− 22,1		− 22,1	
	$\frac{dS}{dP}$	+ 103,4	+ 74,4		+ 106,9		+ 92,9	
		− 14,2	− 14,2		− 17,4		− 27,2	
		+ 89,2	+ 60,2		+ 89,5		+ 65,7	

Right block (2ª Bóveda):

+0,000085(2,915−30,000)	−27,085	− 7,3	−37,085	− 3,15	−44,000	− 3,75	−35,685	− 3,00
−0,1113 (136−60)	+ 76	− 8,4	+70	− 7,8	+ 82	− 7,10	+ 83	− 9,20
−0,0056 (30)	+ 30	− 0,17	+20	− 0,1	+ 20	− 0,10	+ 30	− 0,16
+0,012 (113−550)	− 337	− 4,05	−1,327	− 16,0	− 577	− 6,90	− 767	− 9,20
		− 14,92		− 27,05		− 19,85		− 21,56
+0,000084		− 2,3		− 3,15		− 3,70		− 3,00
+0,1239		+ 9,4		+ 8,60		+ 10,20		+ 10,20
−0,5		− 15,00		− 10,00		− 10,00		− 15,00
+0,00047		− 0,16		− 1,63		− 0,27		− 0,36
		− 8,06		− 5,18		− 3,77		− 8,16
+0,000084		− 2,3		− 3,15		− 3,70		− 3,00
−0,1343		+ 10,2		+ 9,40		− 11,00		− 11,00
−0,00289		− 0,08		+ 0,01		− 0,05		− 0,09
−0,011		+ 3,70		+ 14,60		+ 6,30		+ 8,40
		− 8,88		+ 2,04		− 8,45		− 6,69
−0,000084		− 2,70		− 3,15		− 2,70		− 3,00
−0,1239		− 9,4		− 8,60		− 10,2		− 10,20
−0,5		− 15,0		− 10,00		− 10,0		− 15,00
−0,00047		− 8,16		+ 0,63		+ 0,27		− 0,36
		− 21,94		− 14,82		− 16,23		− 21,84
	−6,864	+ 102,000	+ 186,000		+ 135,000		+ 149,000
	−16,547	+ 134,000	+ 86,000		+ 63,000		+ 134,000
	−16,824	+ 150,000	+ 34,200		+ 141,000		+ 113,000
	−6,864	+ 150,000	+ 101,000		+ 112,000		+ 150,000
θ =		+ 536,000	+ 339,000		+ 450,000		+ 546,000
	−848	+ 12,600	+ 23,00		+ 16,700		+ 18,500
	−299	+ 3,200	+ 2,060		+ 1,500		+ 3,200
	+361	− 3,250	+ 740		− 3,050		− 2,420
	+967	− 21,400	− 14,300		− 15,900		− 21,00
		+ 3,500	+ 3,500		+ 3,500		+ 3,500
η =	−5,350	+ 15,000		+ 2,750		+ 1,780
	−0,254	+ 3,75	+ 6,8		+ 5,0		+ 5,50
	+0,620	+ 5,00	− 3,2		− 2,75		+ 5,05
	−0,617	− 5,50	+ 1,25		+ 5,20		+ 4,10
	+0,857	− 5,65	− 3,80		− 4,20		− 5,60
N =		− 1,4	− 1,45		+ 3,65		− 1,05
	−1,81	+ 27,0	+ 52,0		+ 36,0		+ 39,0
	+0,852	− 6,9	0,14		− 3,2		− 6,9
	+0,624	− 5,6	− 1,26		− 5,3		− 4,2
	−1,73	+ 38,0	+ 25,50		+ 28,2		+ 37,6
		− 38,3	− 38,3		− 38,3		− 38,3
$\frac{dS}{dP}$ =		+ 14,2	+ 36,0		+ 17,4		+ 27,2

Perini Nº 50

1ª Boveda - 2º Termino - Nieve

	5º tanteo		6º tanteo		7º tanteo		4º tanteo	
+0,0006 (10,671 - 36.000)	- 29149	- 1,7	- 26,659	- 1,6	- 27,889	- 1,65	- 26.500	- 1,6
-0,0758 (-86 - 35)	- 128,94	+ 9,8	- 121,75	+ 9,2	- 124,04	+ 9.35	- 119,76	+ 9,0
-0,0146 (20)	+ 19	- 0,3	+ 23	- 0,4	+ 23	- 0,34	+ 30	- 0,4
+0,012 (113 - 800)	- 637	- 7,6	- 887	- 10.6	- 887	- 10,6	- 1,247	- 15,0
		+ 0,2		- 3,4		- 3,24		- 8,0
+0,0006		- 1,7		- 1,6		- 1,65		- 1,6
+0,0884		- 11,5		- 10,8		- 11,00		- 10,5
-0,4886		- 9,3		- 11,2		- 11,20		- 14,5
+0,0004		- 0,2		- 0,3		- 0,30		- 0,5
		- 22.7	23,2	- 23,9		- 24.15		- 27,1
+0,0006		- 1,7		- 1,6		- 1,65		- 1,6
-0,0988		+ 12,8		+ 12,1		+ 12,40		+ 11,9
-0,0136		- 0,3		- 0,3		- 0,32		- 0,4
-0,011		+ 7,0		+ 9,7		+ 9,70		+ 13,6
		+ 17,8		+ 19,90		+ 20.13		+ 23,5
-0,0006		+ 1,7	12,4	+ 1,6		+ 1,65		+ 1,6
-0,0884		+ 11,5	3,7 9,7	+ 10,8		+ 11,00		+ 10,5
-0,511		- 9,7	7	- 11,7		- 11,70		- 15,3
-0,0004		+ 0,2		+ 0,3		+ 0,30		+ 0,5
		+ 3,70	3,2	+ 1,00		+ 1,25		- 2,7

	5º tanteo		6º tanteo		7º tanteo		4º tanteo
+15.186	+ 3,000		- 5.150		- 49,000		- 121,000
+37,886	- 860.000	880,000	- 890,000	-850	- 915,000		- 1,020,000
+38,797	+ 690,000		+ 770,000	+810	+ 780,000		+ 910,000
+16.466	+ 61.000	52,500	+ 16,500		+ 20,500		- 44,500
θ =	- 106,000	-127,000 +16,000	- 108,650	- 45,000	- 164,000		- 275,500
+706	+ 141		- 2.410		- 2,300		- 5,650
+344	- 7.800		- 8,200		- 8,300		- 9,300
-302	- 5.400		- 6,000		- 6,100		- 7,100
-822	- 3,050		- 822		- 1,040		+ 2,200
	- 3.580		- 3.580		- 3,580		- 3.580
η =	- 19,689		- 21,012		- 21.320		- 23,430
+0,212	- 0,04		- 0,7		- 0,69		- 1,7
-0,532	+ 12,00		+ 12,8		+ 13,00		+ 14,5
+0,573	+ 9,20		+ 10,2		+ 10,40		+ 12,0
-0,22	- 0,81		- 0,81		- 0,28		+ 0,6
N =	+ 20,35		+ 21,49		+ 22,43		+ 25,40
+2,15	- 0,43		- 7,40		- 7,0		- 17,1
-1,03	+ 23,50		+ 24,90		+ 25,0		+ 28,0
-0,72	- 12,80		- 14,30		- 14,5		- 16,9
+2,03	+ 7,5		+ 2,03		+ 2,5		- 5,45
	+ 35,8		+ 35,8		+ 35,8		+ 35,8
$\frac{ds}{dx}$	+ 53,57 + 71,60		+ 41,03 + 60,00		+ 41,8 + 59,96		+ 24,35 + 43,40
	+125.17		+101.03		+101,76		+67,75

Disminuir el Ma 15

$\xi_2 = -6500 \times \frac{+113,5}{+404,4} = -1.820$

$\xi_3 = -4.550 \times \frac{+56,2}{+404,4} = -630$

$\xi_4 = -5.200 \times \frac{138,4}{524,9} = -1.360$

$\xi_5 = -5,200 \times \frac{67,75}{467,7} = -750$

$\xi_6 = -5,200 \times \frac{125,17}{467,7} = -1400$ se toma -1000

$\xi_6 = 1100$ se toma 1000

6000 datos
36,000 cifras
1000 operaciones por hora
6000 cifras por hora
60 horas

2ª Boveda

	5º tanteo		6º tanteo		7º tanteo		4º tanteo	
+0,00085 (8450 - 20,000)	- 15,000	- 1,29	- 11,239	- 0,96	- 12,562	- 1,07	- 10,940	- 0,92
-0,111 (-132,5 - 20)	- 157,9	+ 17,50	- 152,85	+ 17,00	- 153,99	+ 17,00	- 150,8	+ 17,00
-0,0056 (20)	+ 19	- 0,10	+ 23	- 0,13	+ 23	- 0,13	+ 30	- 0,17
+0,012 (-220 - 800)	- 970	- 11,60	- 1,220	- 14,60	- 1.220	- 14,60	- 1,580	- 19,00
		+ 4,51		+ 1,31		+ 1,20		- 3,09
+0,00084		- 1,26		- 0,96		- 1,06		- 0,92
+0,1239		- 19,50		- 18,80		- 18,80		- 18,60
-0,5		- 9,50		- 11,50		- 11,50		- 15,00
+0,00047		- 0,45		- 0,57		- 0,57		- 0,75
		- 30,71		- 31,83		- 31,93		- 35,27
+0,00084		- 1,26		- 0,96		- 1,06		- 0,92
-0,124		+ 21,00		+ 20,50		+ 20,50		+ 20,40
-0,0029		- 0,06		- 0,07		- 0,07		- 0,09
-0,011		+ 10,70		+ 13,50		+ 13,50		+ 17,40
		+ 30,38		+ 32,97		+ 32,87		+ 36,79
-0,00084		+ 1,26		+ 0,96		+ 1,06		- 0,92
-0,124		+ 19,50		+ 18,80		+ 18,80		+ 18,60
-0,5		- 9,50		- 11,50		- 11,50		- 15,00
-0,00047		+ 0,45		+ 0,57		+ 0,57		+ 0,75
		+ 11,71	11,21	+ 8,83		+ 8,93		+ 3,43

	5º tanteo		6º tanteo		7º tanteo		4º tanteo
-6.864	- 31,000		- 9,000		- 8,200		+ 21,000
-16.547	+ 510,000	515	+ 520,000		+ 525,000		+ 580,000
-16.824	- 515,000		- 550,000		- 550,000		- 615,000
-6.864	- 80,000	77	- 61,000		- 61,500		- 24,000
	- 116,000	-103,000 -158,000	- 100,000		- 94,700		- 38,000
-848	- 3,850		- 1,120		- 1,020		+ 2,640
-399	+ 12,200		+ 12,600		+ 12,600		+ 14,000
+361	+ 11,000		+ 11,900		+ 11,900		+ 13,300
+967	+ 11,400		+ 8,600		+ 8,620		+ 3,300
	+ 6.580		+ 6.580		+ 6,580		+ 6,580
	+ 37,330		+ 38.560		+ 38,680		+ 39.820
-0,254	- 1,15		- 0,33		- 0,31		+ 0,78
+0,62	- 19,00		- 19,60		- 19,60		- 22,00
-0,617	- 18,60		- 20,40		- 20,40		- 22,60
+0,257	+ 3,00		+ 2,29		+ 2,30		+ 0,88
N =	- 35,75		- 38,04		- 38,01		- 42,94
-1,81	- 8,2		- 2,40		- 2,16		+ 5,6
+0,852	- 26,2		- 27,00		- 27,00		- 30,0
+0,624	+ 19,0		+ 20,5		+ 20,40		+ 22,7
-1,73	- 20,4		- 15,3		- 15,40		- 5,9
	- 35,8		- 35,8		- 35,80		- 35,8
$\frac{ds}{dx}$	- 71,6		- 60,0		- 59,76		- 42,4