

Supporting Information

Structural and Electronic Properties of Double Walled Black Phosphorene Nanotubes: A Density Functional Theory Study

H. N. Fernández-Escamilla^{1,2,*}, J. Guerrero-Sánchez¹, E. Martínez-Guerra², and N. Takeuchi¹

¹Centro de Nanociencias y Nanotecnología, Universidad Nacional Autónoma de México, Apartado Postal 14, Ensenada Baja California, Código Postal 22800, México.

²CICFM Facultad de Ciencias Físico Matemáticas, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, N.L. 66450, México.

Contents

p. S2, Cartesian coordinates for (0,12)@(0,19) DWβPNT

p. S5, Cartesian coordinates for (10,10)@(16,16) DWβPNT

p. S12, Cartesian coordinates for (16,0)@(26,0) DWβPNT

p. S16, Cartesian coordinates for (0,12) SWβPNT

p. S17, Cartesian coordinates for (0,19) SWβPNT

p. S19, Cartesian coordinates for (10,10) SWβPNT

p. S22, Cartesian coordinates for (16,16) SWβPNT

p. S26, Cartesian coordinates for (16,0) SWβPNT

p. S28, Cartesian coordinates for (26,0) SWβPNT

Cartesian coordinates (XYZ format) for (0,12)@(0,19) DW β PNT:

124

P	8.091841836	1.670603049	-1.406230816
P	7.089556426	-0.024457503	-4.004802765
P	6.246743443	1.670526502	-5.188290325
P	4.117848398	-0.024171497	-7.012351929
P	2.812420146	1.670888278	-7.647241327
P	0.074022744	-0.023702819	-8.160268480
P	-1.369417037	1.671281121	-8.021638519
P	-3.983361199	-0.023859424	-7.004778941
P	-5.184618004	1.671099535	-6.184149767
P	-7.063062294	-0.024368435	-4.119096054
P	-7.687840543	1.670613952	-2.812710686
P	-8.106052793	-0.023926530	-0.063899412
P	-7.971405046	1.671120194	1.382640128
P	-7.064736686	-0.023781102	4.027774685
P	-6.246720257	1.671189010	5.225413501
P	-4.105754790	-0.024040947	7.010426442
P	-2.785337360	1.670937544	7.613652810
P	-0.022597142	-0.023841455	8.089396636
P	1.426378294	1.671199439	7.982455396
P	4.069571708	-0.023974788	7.092955156
P	5.256554406	1.671027845	6.261106563
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P	7.225795922	1.670611671	-7.298719835
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P	2.613157893	1.671283771	-9.963233320
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P	-8.315316592	-0.024154136	-6.070474410
P	-9.993423945	1.670719152	-2.559225807
P	-10.223371412	-0.024389181	-1.025154334
P	-9.884829775	1.671349282	2.706406204
P	-9.383956812	-0.023728336	4.172491007
P	-7.208795259	1.671130373	7.338387961
P	-6.016219632	-0.023991616	8.331953431
P	-2.552500002	1.670942411	9.927340889
P	-1.025285062	-0.024128327	10.190277075
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P	7.383452631	1.670996206	7.190269033
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 P 12.565831737 1.670427673 -5.859502340
 P 10.919994813 -0.024802156 -8.483216091
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P	-13.491357921	-0.024721816	-8.537725052
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P	-3.855505753	1.672729296	15.523089142
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P	10.868177613	1.672808060	11.722368802
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P	14.717742520	-0.022754436	6.169158669
P	15.795768209	1.672174426	2.594723186
P	15.987599062	-0.022920198	1.073480592

Cartesian coordinates (XYZ format) for (10,10)@(16,16) DW β PNT:

312

P	14.255922281	-0.122714730	0.218371048
P	13.147690508	-0.119388210	5.693215819
P	13.273263197	2.100181627	5.409923491
P	14.099200529	2.644334355	2.071854963
P	14.155623182	4.868788138	1.770575318
P	9.971810031	-0.118710739	10.216242255
P	10.175076336	2.104944991	9.994774411
P	12.331827457	2.649895973	7.361842479
P	12.494470253	4.865731480	7.080136165
P	13.725541253	5.407270089	3.906584308
P	13.820072215	7.631326571	3.623276192
P	5.264553339	-0.114415737	13.212956415
P	5.555511382	2.110827750	13.119609188
P	8.528275484	2.644430600	11.419841751
P	8.760443782	4.869012484	11.219220355
P	11.261478529	5.414116147	8.862128321
P	11.441663735	7.632997059	8.610022637
P	-0.200799991	-0.113998600	14.333540308
P	0.128644235	2.101471101	14.332834827
P	3.492176079	2.648529710	13.817866561
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P	-5.621659237	-0.123266720	13.070384535
P	-5.331976749	2.101218656	13.177906878
P	-2.031920843	2.648702002	14.154869681
P	-1.725947173	4.867544785	14.197456540
P	1.651492937	5.410839511	14.210362845
P	1.960418044	7.629123549	14.172664001
P	-10.220962223	-0.119600449	9.915922145
P	-10.023584646	2.105229005	10.133464763
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P	-3.850299690	5.403049283	13.716030993
P	-3.564158576	7.627667171	13.785744815
P	-13.289428239	-0.119658026	5.303404011
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P	-11.486967574	2.643989500	8.521252789
P	-11.300073174	4.862494700	8.772334647
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P	-13.815989693	2.638843070	3.508937645
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P	13.697147896	2.143381357	9.161753051
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P	16.361200073	7.665511363	1.069617044
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P	10.696580224	5.367883814	12.406679251
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P	5.301114943	7.675812319	15.483726255
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P	-9.071491871	2.139557863	13.611061438
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P	-16.324490088	5.364918715	-1.207494797
P	-16.327128858	4.901917374	1.072999014
P	-15.552913070	7.656658213	5.255314379

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 P 7.392129264 5.361547482 -14.613761361
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 P 12.339705358 7.670821340 -10.826513309
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 P 8.279475698 2.657216847 1.971221281
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 P 2.433270196 -0.104522035 8.129155103
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P	7.682806791	5.421478812	3.642856989
P	7.826484194	7.612126647	3.322050496
P	-2.810036154	-0.103020788	7.991508430
P	-2.477685608	2.087896116	8.107477057
P	0.687534416	2.659754036	8.452358178
P	1.037739987	4.850485870	8.414652117
P	4.074697537	5.422314826	7.447868955
P	4.376644974	7.612477019	7.273513296
P	-6.986702002	-0.103429562	4.815208075
P	-6.779555669	2.087149198	5.100616459
P	-4.414215371	2.660270693	7.235052763
P	-4.113534463	4.850845640	7.411166295
P	-1.085793970	5.423238052	8.406942282
P	-0.735493793	7.613493429	8.446473276
P	-8.482819795	-0.105374799	-0.209095635
P	-8.484210012	2.085198586	0.139127089
P	-7.834470033	2.660511857	3.258705449
P	-7.694182709	4.850744489	3.582721491
P	-5.831847874	5.422921052	6.163287162
P	-5.566731212	7.612940325	6.393913497
P	-6.731067572	-0.106921371	-5.154581043
P	-6.941351675	2.083693120	-4.869970304
P	-8.255882175	2.656611905	-1.972057348
P	-8.321947972	4.846547314	-1.626375466
P	-8.337960685	5.423489932	1.558970714
P	-8.273546706	7.613405747	1.904417935
P	-2.408961739	-0.106667913	-8.128936881
P	-2.743480337	2.084002672	-8.017733546
P	-5.509732642	2.657226654	-6.437962920
P	-5.777067782	4.847288951	-6.209574088
P	-7.658271608	5.420237852	-3.643362391
P	-7.801618132	7.610543771	-3.321122717
P	2.834794949	-0.106170970	-7.990473017
P	2.501248479	2.084897127	-8.105424674
P	-0.665315734	2.657313810	-8.453501851
P	-1.014457871	4.847888674	-8.415857688
P	-4.049625502	5.419365874	-7.445190008
P	-4.351333870	7.609824129	-7.271227497
P	7.015084993	-0.104631244	-4.816247083
P	6.808395630	2.086073824	-5.100828348
P	4.437492179	2.658425725	-7.232724468
P	4.136875724	4.849472743	-7.407830154
P	1.108995300	5.420002501	-8.407438720
P	0.760243030	7.610521376	-8.445817891
P	8.508397729	2.084633724	-0.140071496
P	7.868076247	2.658457345	-3.261358584
P	7.726036502	4.848447570	-3.582150444
P	5.856967626	5.421936102	-6.161332048
P	5.592535509	7.612162144	-6.393109128
P	8.369820064	5.421750871	-1.558742316

P	8.301661745	7.611438171	-1.904640377
P	10.084253204	-0.170279857	3.367257920
P	6.176984730	-0.172822377	8.638997633
P	9.164079480	2.591442845	5.387432202
P	10.123690254	2.154551128	3.277955871
P	10.567178285	5.354566680	1.205120121
P	-0.078707172	-0.170293783	10.607935679
P	4.240358075	2.591537594	9.727908359
P	6.253316082	2.152288866	8.582280025
P	7.844523927	5.352658423	7.176875892
P	9.211942884	4.916964357	5.305275094
P	10.580244659	7.680790313	1.111091402
P	-6.303228668	-0.168645791	8.528186606
P	-2.291084189	2.588711869	10.360841717
P	0.014567309	2.154655811	10.608111261
P	2.130954051	5.358298198	10.391428164
P	4.331406035	4.917044775	9.692836274
P	7.900969246	7.678728203	7.101834535
P	-10.130674994	-0.173415243	3.192747827
P	-7.939400242	2.594729242	7.038664068
P	-6.225471003	2.156393142	8.587062688
P	-4.390035133	5.355518473	9.653664533
P	-2.195910447	4.914680047	10.374238914
P	2.227900998	7.684111065	10.379613824
P	-10.060345203	-0.171698866	-3.365511009
P	-10.565782422	2.589825576	1.018121171
P	-10.092933993	2.151999304	3.279456945
P	-9.236605501	5.355907324	5.233537474
P	-7.881879471	4.920527487	7.115675398
P	-4.300366301	7.681672316	9.689615307
P	-6.152214312	-0.175838801	-8.637087641
P	-9.140343542	2.588827728	-5.387434543
P	-10.100538188	2.153587262	-3.278014140
P	-10.541254369	5.354154627	-1.202608917
P	-10.552550009	4.915866761	1.112897063
P	-9.190312869	7.682524052	5.312930097
P	0.103800429	-0.173152142	-10.607346175
P	-4.219401377	2.589510790	-9.727590768
P	-6.229702814	2.149094340	-8.579013245
P	-7.820349691	5.349740552	-7.176859191
P	-9.188448367	4.914696039	-5.305319666
P	-10.555792823	7.680334150	-1.108961546
P	6.326408591	-0.169649117	-8.528354381
P	2.315962494	2.585543966	-10.358937114
P	0.010523718	2.151718998	-10.608606041
P	-2.109193953	5.355943607	-10.391801317
P	-4.309358973	4.915534613	-9.690304332
P	-7.877139200	7.675991052	-7.101362114
P	10.158709099	-0.176248740	-3.193189822
P	7.963873102	2.593707712	-7.040615005
P	6.247768069	2.155313331	-8.586727811

P	4.414246067	5.352852072	-9.650815850
P	2.221044988	4.911326754	-10.373460633
P	-2.203844745	7.681936130	-10.379551088
P	10.591900096	2.587762075	-1.015457647
P	10.125847107	2.149279009	-3.278964472
P	9.263718803	5.355070863	-5.235692303
P	7.905959743	4.919452793	-7.115442441
P	4.323733522	7.678769733	-9.688890668
P	10.582341116	4.914223201	-1.110526374
P	9.217694192	7.681407952	-5.314372514

Cartesian coordinates (XYZ format) for (16,0)@(26,0) DW β PNT:

168

P	13.657089776	-0.094324697	0.051315474
P	13.516819262	1.437302792	1.670411648
P	13.160934186	-0.076532935	3.277453244
P	12.656848078	1.432267801	4.853990378
P	12.021084806	-0.079963709	6.375473518
P	11.207374075	1.448529704	7.786225751
P	10.181022865	-0.084159948	9.045418080
P	8.974970366	1.432959998	10.161063820
P	7.656171007	-0.075941630	11.162606178
P	6.259693759	1.433318193	12.047667048
P	4.790510100	-0.092133106	12.761515608
P	3.236171524	1.441759577	13.229898033
P	1.613971213	-0.078041450	13.464215855
P	-0.039118235	1.431600718	13.526460226
P	-1.691881372	-0.077367362	13.451488451
P	-3.310713395	1.443734316	13.205816158
P	-4.858911905	-0.091469299	12.723716115
P	-6.322545083	1.433024491	11.998433828
P	-7.711603377	-0.076526245	11.101763816
P	-9.022684400	1.432444289	10.090718504
P	-10.222688363	-0.084407674	8.968442242
P	-11.237751549	1.448492103	7.700876326
P	-12.039153871	-0.080173409	6.283226236
P	-12.662911895	1.431871574	4.756493800
P	-13.155236267	-0.076567031	3.175957965
P	-13.498806712	1.437808216	1.566851561
P	-13.623672388	-0.094067599	-0.053338079
P	-13.486957066	1.437027967	-1.672920307
P	-13.124108702	-0.077367369	-3.278143462
P	-12.618486797	1.431688484	-4.854708565
P	-11.980185181	-0.078769644	-6.377469173
P	-11.171702032	1.450044798	-7.791613273
P	-10.148371520	-0.083216239	-9.052323082
P	-8.940575562	1.433173452	-10.166788620
P	-7.624113379	-0.076007748	-11.170002086
P	-6.229078820	1.433967735	-12.055142739
P	-4.760440081	-0.091634556	-12.767263009
P	-3.206998118	1.442799190	-13.233542637
P	-1.585706229	-0.077353551	-13.466197407
P	0.066646036	1.432624107	-13.528853368
P	1.719243314	-0.076318454	-13.453746246
P	3.338568708	1.444192952	-13.206605885
P	4.886605027	-0.091045484	-12.722514473
P	6.350396003	1.432997025	-11.995758704
P	7.740568367	-0.076454401	-11.100333498

P	9.053217654	1.432710136	-10.091871583
P	10.253083238	-0.084105979	-8.970260117
P	11.266513592	1.450016796	-7.703142587
P	12.064791731	-0.078497410	-6.283750008
P	12.691041659	1.432294903	-4.756963192
P	13.186330323	-0.077274546	-3.178163348
P	13.531570464	1.437044688	-1.569231500
P	15.618889932	2.300899977	1.971608807
P	15.777289516	3.771537682	0.060340969
P	14.649459059	2.297029099	5.599293169
P	15.218657931	3.789480546	3.816623509
P	12.951845225	2.312193367	8.992345392
P	13.915092261	3.785606474	7.336602547
P	10.356013417	2.297272840	11.778527131
P	11.741210337	3.781674771	10.484543747
P	7.274664033	2.297075130	13.914733134
P	8.865339362	3.789150726	12.913498219
P	3.708903055	2.306199899	15.297540657
P	5.552150048	3.773463327	14.740717047
P	-0.047896621	2.296281397	15.654755007
P	1.827009075	3.787362776	15.579133615
P	-3.801106790	2.308027130	15.269933692
P	-1.921210450	3.788863666	15.565077354
P	-7.352504126	2.297022364	13.857367148
P	-5.638001831	3.774547984	14.696152849
P	-10.414919505	2.296495667	11.698842575
P	-8.933885292	3.788654401	12.844000697
P	-12.991147052	2.312169134	8.893156933
P	-11.792932421	3.781140629	10.395994845
P	-14.661381352	2.296699611	5.486252981
P	-13.940721365	3.785258534	7.229241586
P	-15.603270549	2.301451529	1.850248880
P	-15.217061590	3.789536676	3.699530873
P	-15.588210559	2.301862913	-1.975982711
P	-15.744165024	3.772198926	-0.062351427
P	-14.610709723	2.295627255	-5.602797726
P	-15.180829855	3.788414512	-3.821664992
P	-12.917542712	2.314338543	-8.994887675
P	-13.875753685	3.786999451	-7.336422574
P	-10.322234034	2.297032450	-11.784059571
P	-11.708681821	3.782273845	-10.490909707
P	-7.244221245	2.297802805	-13.922211248
P	-8.834042465	3.789330785	-12.920317650
P	-3.679219268	2.306691413	-15.301695988
P	-5.520982402	3.773857079	-14.746993875
P	0.074572527	2.297438186	-15.657102461
P	-1.799319225	3.788848494	-15.581414306
P	3.829779057	2.308826040	-15.270163548
P	1.948659497	3.789262795	-15.566952513
P	7.380387597	2.296854941	-13.854628454
P	5.667443727	3.775121564	-14.694257740

P	10.444947761	2.296511736	-11.700589291
P	8.961826807	3.788519085	-12.843334390
P	13.021110146	2.313794871	-8.893406577
P	11.823226693	3.781446724	-10.397820576
P	14.688729985	2.296425338	-5.490208301
P	13.967209140	3.787460097	-7.228997526
P	15.635722931	2.301015423	-1.853689120
P	15.247881347	3.788414510	-3.704254986
P	8.066575604	-0.078683128	0.031345226
P	7.924903034	1.444361157	1.606952496
P	7.463229558	-0.089241855	3.110875583
P	6.684910789	1.435746181	4.486612402
P	5.682960508	-0.085942249	5.713242949
P	4.473193169	1.446871972	6.720658618
P	3.067005537	-0.080916861	7.437315302
P	1.550501476	1.439243307	7.897471379
P	-0.015314976	-0.091399892	8.073654292
P	-1.579702489	1.439392387	7.887076535
P	-3.092219137	-0.081072594	7.415055909
P	-4.494383695	1.446565680	6.689632778
P	-5.697579786	-0.085922711	5.673940718
P	-6.689443299	1.434768068	4.437520188
P	-7.456160952	-0.089912835	3.054781855
P	-7.901301271	1.444437806	1.545931731
P	-8.027879061	-0.077969766	-0.031972504
P	-7.886949337	1.444718494	-1.608348214
P	-7.428125387	-0.089673364	-3.112820402
P	-6.651333739	1.434938673	-4.490422722
P	-5.652142320	-0.086085525	-5.720117931
P	-4.441433968	1.446408017	-6.727548755
P	-3.034973355	-0.081567679	-7.443497092
P	-1.517130730	1.438098974	-7.901062238
P	0.048818039	-0.092764077	-8.074953455
P	1.612596236	1.438684191	-7.886335071
P	3.125878180	-0.080857115	-7.413307188
P	4.527900155	1.446879776	-6.687887856
P	5.732846850	-0.085740289	-5.673889263
P	6.723503123	1.434932222	-4.437020634
P	7.489257750	-0.090148994	-3.054256382
P	7.936462716	1.443809702	-1.545885589
P	9.976707363	2.318771386	2.020186865
P	10.160574388	3.781584636	0.039870973
P	8.418084938	2.304196470	5.664373477
P	9.390175639	3.764559001	3.929382495
P	5.628197940	2.322651074	8.467801325
P	7.162834381	3.772272045	7.196550739
P	1.960965536	2.310197500	9.951436222
P	3.858286541	3.778972598	9.377169754
P	-2.004058990	2.310399506	9.938144209
P	-0.022382421	3.761295381	10.166488536
P	-5.661332690	2.322709081	8.427751027

P	-3.896973324	3.778567464	9.349067790
P	-8.432417530	2.304031106	5.599838342
P	-7.188742748	3.771370202	7.144894540
P	-9.957899920	2.318780218	1.938437559
P	-9.390658969	3.764384550	3.855069763
P	-9.940391417	2.318656577	-2.018906811
P	-10.122878469	3.782755549	-0.041365695
P	-8.386836237	2.303958161	-5.664867571
P	-9.355862910	3.764446442	-3.928946053
P	-5.595371225	2.322560882	-8.474827267
P	-7.132980421	3.771515555	-7.201469717
P	-1.924727636	2.309199566	-9.955586310
P	-3.822874518	3.777860901	-9.384364479
P	2.039439416	2.309401469	-9.937209743
P	0.058205693	3.760261670	-10.168035141
P	5.694483607	2.323135715	-8.426272247
P	3.930656180	3.778766951	-9.347394885
P	8.467492977	2.304012439	-5.598149686
P	7.224092534	3.771308765	-7.144484652
P	9.992150818	2.317874854	-1.940867267
P	9.424063666	3.764253072	-3.854393021

Cartesian coordinates (XYZ format) for (0, 12) SWßPNT:

48

P	8.284115420	1.670335400	-1.421766121
P	7.323757780	-0.023819493	-4.156819742
P	6.486196205	1.671033022	-5.351358913
P	4.255825652	-0.024147736	-7.266291975
P	2.936322695	1.670726462	-7.893284202
P	0.038039589	-0.024059808	-8.413544007
P	-1.417539495	1.670863294	-8.292221796
P	-4.172119240	-0.023631018	-7.285410624
P	-5.372740910	1.671218978	-6.454004986
P	-7.266146258	-0.023929643	-4.230129656
P	-7.887882377	1.670911897	-2.909852395
P	-8.400481311	-0.023901336	-0.034364717
P	-8.275634903	1.670995200	1.420161824
P	-7.279121426	-0.023600744	4.173080446
P	-6.448870566	1.671261035	5.374214859
P	-4.225159597	-0.023345867	7.270920675
P	-2.905993865	1.671542759	7.895787687
P	-0.029033714	-0.023208233	8.417940471
P	1.425753643	1.671635532	8.287948138
P	4.200375089	-0.024157740	7.279879929
P	5.400465887	1.670627695	6.445486185
P	7.295294974	-0.025033853	4.200539123
P	7.924857001	1.669782076	2.885247559
P	8.408063458	-0.024617067	0.031743974
P	10.163605807	1.670505960	-2.799579056
P	9.655936547	-0.023705278	-4.257029260
P	7.409076767	1.670422370	-7.490037336
P	6.241110075	-0.023924877	-8.497936057
P	2.637716925	1.670500466	-10.211006868
P	1.118133565	-0.023792389	-10.482357593
P	-2.834884389	1.670975521	-10.147598575
P	-4.283813910	-0.023309327	-9.615944461
P	-7.517947453	1.671046514	-7.373283729
P	-8.518673144	-0.023251279	-6.198228751
P	-10.203346245	1.670842615	-2.623968036
P	-10.474177407	-0.023457772	-1.104466597
P	-10.135540839	1.670979271	2.828768730
P	-9.609815368	-0.023295600	4.279581945
P	-7.370197057	1.671143304	7.517976064
P	-6.196098621	-0.023113508	8.519699388
P	-2.625867799	1.671607542	10.212440881
P	-1.107040015	-0.022686972	10.489381115
P	2.843962436	1.671218840	10.140847413
P	4.294720754	-0.023168342	9.614686203
P	7.557523856	1.670378299	7.343611080
P	8.550265640	-0.023971706	6.162569613
P	10.240349092	1.669734166	2.594062980
P	10.494401652	-0.024518626	1.071310275

Cartesian coordinates (XYZ format) for (0, 19) SWßPNT:

76

P	13.633894589	1.670967291	-1.437847200
P	12.962763268	-0.026067950	-4.414807444
P	12.406046731	1.669644332	-5.782928948
P	10.800977735	-0.025411324	-8.373950578
P	9.836148128	1.670342836	-9.492100794
P	7.511430790	-0.026061760	-11.422177422
P	6.236024630	1.669754201	-12.164409351
P	3.406232718	-0.025408094	-13.242228032
P	1.959233527	1.670838416	-13.527141307
P	-1.059255575	-0.026433642	-13.597963934
P	-2.519891632	1.669845213	-13.390789299
P	-5.399866384	-0.025084715	-12.480436033
P	-6.719231605	1.670897777	-11.817821094
P	-9.177669669	-0.025086849	-10.053732353
P	-10.217575007	1.670444541	-9.007236690
P	-11.967141278	-0.025220310	-6.552163137
P	-12.605586430	1.670664411	-5.220903072
P	-13.454876532	-0.023934224	-2.300009121
P	-13.621337067	1.671876675	-0.831872145
P	-13.476304481	-0.025331825	2.224683390
P	-13.162552092	1.670587244	3.668329032
P	-12.013415294	-0.024678471	6.480084744
P	-11.238995189	1.670961375	7.737691894
P	-9.233280172	-0.023968475	10.009715783
P	-8.093047629	1.671758273	10.947885919
P	-5.483899379	-0.023525466	12.467488208
P	-4.103503887	1.672347562	12.987974196
P	-1.140606366	-0.022767131	13.590213863
P	0.333481891	1.673543978	13.640288962
P	3.319944541	-0.021665444	13.243796975
P	4.728162628	1.674488620	12.804968485
P	7.428596398	-0.021718569	11.443894536
P	8.620998045	1.674257148	10.575394110
P	10.727263158	-0.022697562	8.425901018
P	11.576682873	1.673052186	7.217508109
P	12.926141995	-0.023011597	4.487425065
P	13.341162900	1.672620644	3.070292098
P	13.705899381	-0.024694319	0.038308293
P	15.616403354	1.669159240	-2.662416930
P	15.279147391	-0.025348146	-4.157801226
P	13.880251102	1.669624813	-7.585659141
P	13.071513210	-0.024773207	-8.886892897
P	10.669289815	1.668747690	-11.666420840
P	9.491443971	-0.025730161	-12.643236444
P	6.317558974	1.669568052	-14.488880823
P	4.887106296	-0.025520336	-15.034871613
P	1.268547420	1.669917529	-15.748638254
P	-0.263199116	-0.025619276	-15.782144989

P	-3.892754911	1.669478956	-15.267597727
P	-5.352306478	-0.025804814	-14.805934401
P	-8.613666252	1.670754293	-13.167800614
P	-9.856176149	-0.023958926	-12.276235885
P	-12.444168561	1.668875701	-9.683712003
P	-13.333996034	-0.025189821	-8.436964064
P	-14.929891404	1.670625012	-5.111645848
P	-15.359197002	-0.023875996	-3.640809800
P	-15.784496275	1.670342897	0.037196532
P	-15.709129246	-0.024574316	1.567405885
P	-14.919836117	1.669787162	5.199347673
P	-14.338455128	-0.024388969	6.617435817
P	-12.396305118	1.671030186	9.756948108
P	-11.381592591	-0.023325609	10.904191502
P	-8.555136542	1.671452231	13.228373720
P	-7.233107757	-0.022872429	13.998735029
P	-3.808287730	1.672415321	15.296253497
P	-2.307598136	-0.022644703	15.600348623
P	1.358261795	1.673662330	15.726623603
P	2.877069924	-0.021092181	15.526619567
P	6.383477351	1.674215258	14.435387873
P	7.751013557	-0.020995570	13.746966558
P	10.712331959	1.673157827	11.591121320
P	11.784104152	-0.021385934	10.498820303
P	13.885254311	1.671758792	7.509844893
P	14.566347823	-0.022606836	6.137462482
P	15.618589596	1.671749657	2.580421543
P	15.802230290	-0.022560720	1.059190546

Cartesian coordinates (XYZ format) for (10,10) SW β PNT:

120

P 8.65945 -0.108126 0.205462
P 6.87897 -0.104841 5.24814
P 7.08149 2.0926 4.98062
P 8.43385 2.65576 1.99999
P 8.50419 4.85215 1.67708
P 2.48339 -0.101112 8.27213
P 2.80282 2.09595 8.17174
P 5.64183 2.66047 6.56301
P 5.8915 4.8566 6.34075
P 7.82252 5.41706 3.7073
P 7.9583 7.615 3.40291
P -2.84855 -0.104585 8.14457
P -2.53166 2.092 8.25474
P 0.709352 2.66163 8.60817
P 1.04383 4.85704 8.57486
P 4.15339 5.42387 7.58648
P 4.44124 7.62034 7.41421
P -7.09231 -0.105968 4.9077
P -6.90318 2.09122 5.18382
P -4.48164 2.65742 7.37654
P -4.19429 4.85318 7.54554
P -1.09486 5.42145 8.56449
P -0.760781 7.61732 8.5996
P -8.62379 -0.10705 -0.204743
P -8.63128 2.09029 0.13028
P -7.9689 2.65636 3.32896
P -7.83408 4.85193 3.63435
P -5.91918 5.41732 6.27957
P -5.66798 7.61404 6.5015
P -6.85274 -0.107066 -5.24068
P -7.05761 2.08976 -4.97393
P -8.39922 2.65702 -1.99606
P -8.46911 4.85282 -1.66901
P -8.48382 5.41578 1.59556
P -8.41263 7.61247 1.92238
P -2.46025 -0.107972 -8.27193
P -2.78246 2.08878 -8.17471
P -5.61858 2.65592 -6.55632
P -5.86725 4.85174 -6.33433
P -7.79686 5.41692 -3.70044
P -7.9309 7.61373 -3.39487
P 2.87412 -0.113419 -8.14481
P 2.55536 2.08362 -8.2531
P -0.689385 2.65348 -8.61343
P -1.02009 4.84876 -8.57805
P -4.12873 5.41632 -7.58132
P -4.41691 7.61306 -7.41192
P 7.12127 -0.108474 -4.91456

P 6.93167 2.08915 -5.18982
P 4.50729 2.65015 -7.37701
P 4.2199 4.84624 -7.54798
P 1.11901 5.41151 -8.56615
P 0.785578 7.60801 -8.59694
P 8.66636 2.08985 -0.127977
P 7.99841 2.65679 -3.33595
P 7.86379 4.85285 -3.64225
P 5.94651 5.41346 -6.28549
P 5.69531 7.61056 -6.50715
P 8.51914 5.41773 -1.60402
P 8.44583 7.61506 -1.92578
P 10.2232 -0.174324 3.41395
P 6.26447 -0.167366 8.75666
P 9.29334 2.59025 5.46401
P 10.2515 2.1514 3.3491
P 10.7187 5.35322 1.21147
P -0.0709321 -0.167992 10.7559
P 4.30694 2.59623 9.8654
P 6.3248 2.15717 8.71933
P 7.95167 5.35749 7.2728
P 9.32543 4.91534 5.4028
P 10.7213 7.67974 1.14472
P -6.3733 -0.17271 8.65389
P -2.30409 2.59287 10.5078
P 0.00189683 2.15574 10.7574
P 2.16397 5.36151 10.5405
P 4.3749 4.92056 9.84056
P 7.99948 7.68396 7.21565
P -10.248 -0.174785 3.24945
P -8.03896 2.59003 7.14391
P -6.31654 2.1514 8.69925
P -4.43734 5.35621 9.79524
P -2.23446 4.91681 10.5213
P 2.23604 7.68624 10.5231
P -10.1952 -0.172938 -3.40381
P -10.7045 2.5882 1.04276
P -10.2314 2.14987 3.31589
P -9.35087 5.35684 5.31215
P -7.99197 4.91535 7.19365
P -4.3695 7.68121 9.82115
P -6.24249 -0.173686 -8.75129
P -9.27089 2.58973 -5.45435
P -10.2221 2.15139 -3.33748
P -10.6837 5.35617 -1.20742
P -10.6966 4.9137 1.11278
P -9.30888 7.68219 5.37157
P 0.0945545 -0.177573 -10.7538
P -4.29065 2.58931 -9.86409
P -6.30488 2.15067 -8.71194
P -7.92979 5.35492 -7.26305
P -9.30363 4.9147 -5.39256

P -10.6877 7.68174 -1.13622
P 6.39791 -0.17801 -8.66029
P 2.32652 2.5835 -10.5074
P 0.0208322 2.14596 -10.7609
P -2.14224 5.35414 -10.5413
P -4.35246 4.91423 -9.83594
P -7.97405 7.68019 -7.20769
P 10.2784 -0.173462 -3.25706
P 8.06606 2.58774 -7.15023
P 6.34068 2.14658 -8.70272
P 4.46082 5.34844 -9.79853
P 2.25776 4.90768 -10.5232
P -2.21241 7.6788 -10.5226
P 10.7369 2.58936 -1.05305
P 10.26 2.1517 -3.32729
P 9.37758 5.35541 -5.32308
P 8.01746 4.9138 -7.20335
P 4.39138 7.67397 -9.82489
P 10.7316 4.91545 -1.11498
P 9.33724 7.68124 -5.37915

Cartesian coordinates (XYZ format) for (16,16) SW β PNT:

192

P 14.0484 -0.116587 0.222165
P 12.903 -0.110764 5.55627
P 13.0223 2.10122 5.25654
P 13.9049 2.65188 2.0432
P 13.9455 4.86154 1.72377
P 9.79541 -0.113372 10.0567
P 10.0238 2.0986 9.82924
P 12.0704 2.65596 7.18688
P 12.2327 4.86631 6.91261
P 13.5132 5.41839 3.83075
P 13.6 7.62923 3.51983
P 5.20146 -0.117124 13.0373
P 5.49423 2.09613 12.9132
P 8.40252 2.65053 11.2473
P 8.65648 4.86129 11.0582
P 11.0221 5.41674 8.69412
P 11.2208 7.62849 8.44318
P -0.188193 -0.117536 14.0333
P 0.130224 2.09588 14.0314
P 3.45546 2.64889 13.61
P 3.76272 4.85961 13.5278
P 6.85867 5.41235 12.2456
P 7.13621 7.62458 12.0885
P -5.55259 -0.118264 12.8914
P -5.25728 2.09523 13.0087
P -2.02097 2.64773 13.895
P -1.70827 4.85902 13.9347
P 1.64588 5.41198 13.9343
P 1.96293 7.6245 13.8985
P -10.0678 -0.117908 9.77919
P -9.84131 2.09565 10.0024
P -7.19194 2.64772 12.0583
P -6.9182 4.85883 12.2177
P -3.81935 5.41188 13.5022
P -3.51295 7.62456 13.5903
P -13.0496 -0.118708 5.17512
P -12.9248 2.09452 5.46793
P -11.2635 2.64804 8.38262
P -11.0726 4.85935 8.63396
P -8.70273 5.41111 11.0088
P -8.45249 7.62376 11.2062
P -14.0328 -0.118461 -0.219745
P -14.0318 2.09486 0.0986907
P -13.6173 2.647 3.42693
P -13.5354 4.85801 3.73335
P -12.2579 5.41116 6.83364
P -12.1026 7.62377 7.11178
P -12.8783 -0.119254 -5.5786

P -12.9968 2.09437 -5.28462
 P -13.8908 2.64715 -2.05169
 P -13.9311 4.858 -1.73648
 P -13.9379 5.41052 1.61626
 P -13.9017 7.62342 1.93184
 P -9.75784 -0.119233 -10.0871
 P -9.97998 2.09462 -9.86177
 P -12.0429 2.64654 -7.21769
 P -12.2024 4.85749 -6.94204
 P -13.4945 5.41057 -3.84705
 P -13.5826 7.62319 -3.54123
 P -5.14892 -0.11947 -13.0613
 P -5.44308 2.09347 -12.9371
 P -8.35922 2.64714 -11.2825
 P -8.6114 4.85805 -11.0901
 P -10.9903 5.41088 -8.72402
 P -11.1896 7.62345 -8.47532
 P 0.248882 -0.119571 -14.0322
 P -0.0683644 2.09399 -14.0317
 P -3.39987 2.64583 -13.6235
 P -3.70588 4.85703 -13.5443
 P -6.8084 5.40995 -12.2709
 P -7.08633 7.62273 -12.1164
 P 5.60652 -0.119914 -12.8666
 P 5.3113 2.09309 -12.9881
 P 2.082 2.64594 -13.8862
 P 1.7675 4.85697 -13.927
 P -1.58797 5.40952 -13.9426
 P -1.90341 7.62257 -13.9062
 P 10.1072 -0.122778 -9.74427
 P 9.87861 2.08967 -9.96824
 P 7.24065 2.64559 -12.0291
 P 6.96643 4.8563 -12.189
 P 3.87763 5.40941 -13.487
 P 3.57113 7.62189 -13.5742
 P 13.0726 -0.125596 -5.14757
 P 12.9471 2.08593 -5.44589
 P 11.298 2.64151 -8.34928
 P 11.102 4.85123 -8.6022
 P 8.74641 5.4083 -10.9758
 P 8.49564 7.62026 -11.174
 P 14.0467 2.09465 -0.101717
 P 13.6318 2.64194 -3.40578
 P 13.5538 4.85112 -3.71731
 P 12.284 5.40285 -6.80234
 P 12.1276 7.61485 -7.0813
 P 13.9527 5.40633 -1.6038
 P 13.9155 7.61677 -1.92616
 P 15.8518 -0.153771 3.28387
 P 13.3904 -0.151357 9.08726
 P 15.2839 2.61315 5.3188
 P 15.887 2.14147 3.13303

P 16.1457 5.37216 1.199
 P 8.90024 -0.156129 13.5065
 P 12.0916 2.61186 10.7474
 P 13.4806 2.14276 8.95584
 P 14.4674 5.37742 7.26551
 P 15.3362 4.90757 5.17028
 P 16.1569 7.66693 1.03795
 P 3.05055 -0.158084 15.8844
 P 7.05901 2.6069 14.5478
 P 9.028 2.13858 13.421
 P 10.5889 5.37209 12.2347
 P 12.1915 4.90534 10.6302
 P 14.5331 7.67309 7.128
 P -3.26754 -0.158166 15.8411
 P 0.946443 2.6067 16.141
 P 3.19827 2.13798 15.8584
 P 5.10104 5.37039 15.3526
 P 7.19712 4.90168 14.4823
 P 10.7023 7.66756 12.1297
 P -9.08923 -0.158666 13.3787
 P -5.30859 2.60629 15.2708
 P -3.11989 2.13774 15.8733
 P -1.17119 5.37013 16.132
 P 1.09798 4.90166 16.1299
 P 5.24446 7.66686 15.3006
 P -13.521 -0.158339 8.87608
 P -10.7567 2.60606 12.0718
 P -8.96461 2.13713 13.465
 P -7.26234 5.36912 14.4537
 P -5.16486 4.90117 15.3211
 P -1.01717 7.66627 16.1404
 P -15.8902 -0.159639 3.01504
 P -14.5613 2.60574 7.03042
 P -13.4391 2.13748 9.00373
 P -12.2473 5.36965 10.568
 P -10.6429 4.90112 12.173
 P -7.12623 7.66579 14.5198
 P -15.8336 -0.159641 -3.30127
 P -16.1431 2.60565 0.912904
 P -15.8649 2.13599 3.16538
 P -15.3631 5.36811 5.06706
 P -14.4964 4.90095 7.16514
 P -12.1444 7.66599 10.681
 P -13.3609 -0.159534 -9.11631
 P -15.2591 2.60496 -5.34251
 P -15.8665 2.13632 -3.15556
 P -16.1297 5.36919 -1.20253
 P -16.1324 4.90057 1.06676
 P -15.3133 7.66471 5.21088
 P -8.84759 -0.159825 -13.5387
 P -12.0478 2.605 -10.781
 P -13.4462 2.13648 -8.99299

P -14.4378 5.36855 -7.29125
P -15.3104 4.89974 -5.19631
P -16.1381 7.66562 -1.05141
P -2.98216 -0.160621 -15.8967
P -7.00083 2.6052 -14.5774
P -8.97592 2.13597 -13.4592
P -10.5432 5.36912 -12.2683
P -12.1506 4.8999 -10.6666
P -14.5041 7.66498 -7.15448
P 3.33616 -0.160444 -15.8255
P -0.880113 2.60463 -16.1446
P -3.133 2.13498 -15.8705
P -5.03749 5.36703 -15.3739
P -7.13669 4.90039 -14.51
P -10.6558 7.66555 -12.1657
P 9.14204 -0.160721 -13.3428
P 5.37344 2.60401 -15.2505
P 3.18739 2.13539 -15.8603
P 1.23728 5.36769 -16.1267
P -1.03247 4.89979 -16.1355
P -5.17932 7.6637 -15.3251
P 13.5544 -0.166014 -8.83808
P 10.8024 2.60241 -12.0328
P 9.01681 2.13412 -13.4307
P 7.32326 5.36721 -14.423
P 5.23057 4.899 -15.3004
P 1.08726 7.66402 -16.1354
P 15.9089 -0.164459 -2.99491
P 14.5909 2.59797 -6.99997
P 13.4726 2.12825 -8.97216
P 12.2856 5.36426 -10.5295
P 10.6872 4.89645 -12.1377
P 7.18466 7.66324 -14.4899
P 16.1612 2.6042 -0.90175
P 15.8798 2.12988 -3.14975
P 15.387 5.36186 -5.04316
P 14.5215 4.89221 -7.13947
P 12.1841 7.65919 -10.645
P 16.1489 4.89785 -1.06473
P 15.336 7.65788 -5.18901

Cartesian coordinates (XYZ format) for (16, 0) SW β PNT:

64

P 8.20293 -0.0818883 0.0299956
P 8.03172 1.43492 1.6301
P 7.55618 -0.0805177 3.16753
P 6.79194 1.43985 4.5772
P 5.77278 -0.0838439 5.80966
P 4.52785 1.43764 6.8148
P 3.11346 -0.0830828 7.56388
P 1.57853 1.43781 8.01916
P -0.0167956 -0.081912 8.17232
P -1.61119 1.43757 8.00691
P -3.14479 -0.0821848 7.5404
P -4.55511 1.43798 6.77905
P -5.79382 -0.0820222 5.76122
P -6.80672 1.43754 4.51775
P -7.56058 -0.0821877 3.10239
P -8.01699 1.43782 1.56538
P -8.16925 -0.0818858 -0.0310318
P -8.00245 1.43792 -1.62561
P -7.53451 -0.0816447 -3.15939
P -6.7712 1.43808 -4.56942
P -5.75164 -0.0823264 -5.80619
P -4.5058 1.43755 -6.81558
P -3.08855 -0.081857 -7.56657
P -1.55125 1.43793 -8.02146
P 0.0442804 -0.081776 -8.1731
P 1.63714 1.43896 -8.00906
P 3.16976 -0.0815654 -7.54641
P 4.58033 1.43921 -6.79038
P 5.81508 -0.0847216 -5.77444
P 6.82564 1.43567 -4.52926
P 7.585 -0.0803906 -3.11096
P 8.0499 1.43716 -1.57074
P 10.0758 2.31794 2.05662
P 10.2909 3.76889 0.042835
P 8.5202 2.31707 5.75467
P 9.47922 3.76979 3.98503
P 5.67858 2.31474 8.56149
P 7.2397 3.76843 7.30055
P 1.97873 2.31588 10.0711
P 3.90546 3.76916 9.4992
P -2.02437 2.31611 10.0562
P -0.0234121 3.76909 10.2623
P -5.72 2.3163 8.51455
P -3.94842 3.76903 9.46954
P -8.54758 2.31633 5.67424
P -7.27474 3.76896 7.23585
P -10.0687 2.31653 1.96417
P -9.49393 3.7687 3.89603

P -10.0512 2.3166 -2.04101
P -10.2592 3.76925 -0.0398527
P -8.50418 2.31657 -5.73784
P -9.46209 3.76916 -3.96597
P -5.6585 2.31622 -8.55928
P -7.22272 3.76888 -7.2907
P -1.94783 2.31652 -10.074
P -3.87824 3.76912 -9.50194
P 2.04909 2.31646 -10.0595
P 0.0527877 3.77012 -10.2638
P 5.7405 2.31719 -8.5299
P 3.97008 3.77066 -9.47786
P 8.56271 2.31509 -5.69206
P 7.29237 3.76781 -7.25402
P 10.0988 2.31697 -1.97435
P 9.51366 3.76761 -3.91294

Cartesian coordinates (XYZ format) for (26, 0) SWßPNT:

104

P 13.4237 -0.0790699 0.0525709
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 P 13.3337 1.43585 -1.56503
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 P 15.5493 3.78504 0.0635994
 P 14.503 2.29959 5.57188
 P 15.0735 3.78445 3.78555
 P 12.7351 2.30042 8.8717
 P 13.7165 3.78521 7.27359
 P 10.2309 2.30075 11.6551
 P 11.5656 3.7835 10.3391
 P 7.14728 2.29966 13.7565
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 P 5.44158 3.78501 14.512
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 P -15.3678 2.30125 -1.93097
 P -15.4874 3.78446 -0.0607408
 P -14.4515 2.30076 -5.5559
 P -15.0184 3.78503 -3.77168
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 P -3.62866 2.30038 -15.0597
 P -5.41616 3.78456 -14.5092
 P 0.0748514 2.30124 -15.4974
 P -1.78979 3.78507 -15.3885
 P 3.77225 2.30057 -15.0353
 P 1.93813 3.78537 -15.3768
 P 7.25041 2.3 -13.7033
 P 5.55082 3.78568 -14.4735
 P 10.3245 2.30158 -11.5771
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P 14.5447 2.29985 -5.46004
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P 15.4421 2.30111 -1.81912
P 15.1038 3.78424 -3.66951