2021 12

Examples with « Gene-VPP Dinghy 3.0 »

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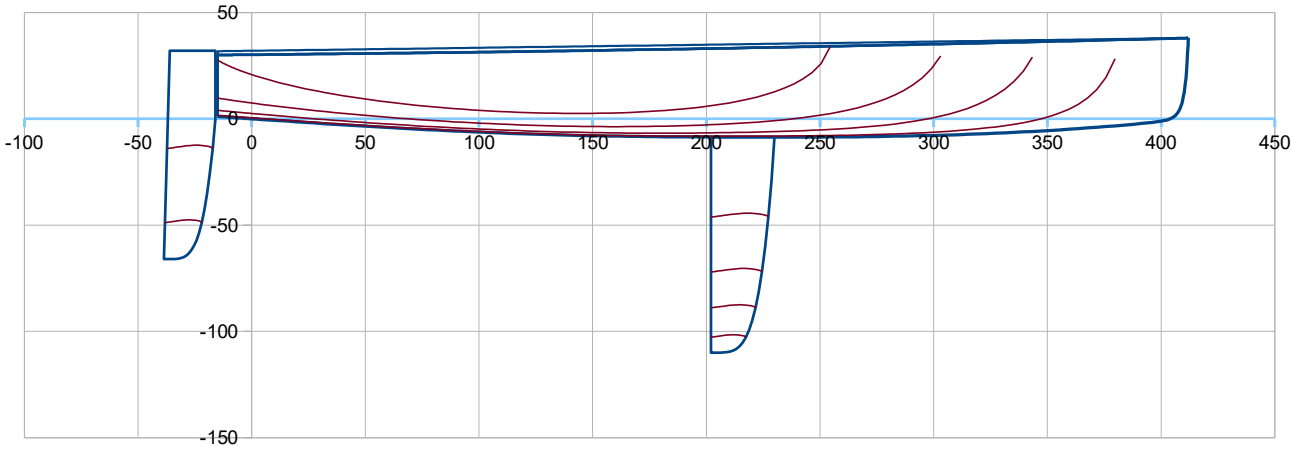
« Gene-VPP Dinghy 3.0 » post-application is here illustrated through the investigation of the speed prediction of the dinghies proposed as examples for the main application Gene-Hull Dinghy 3.0

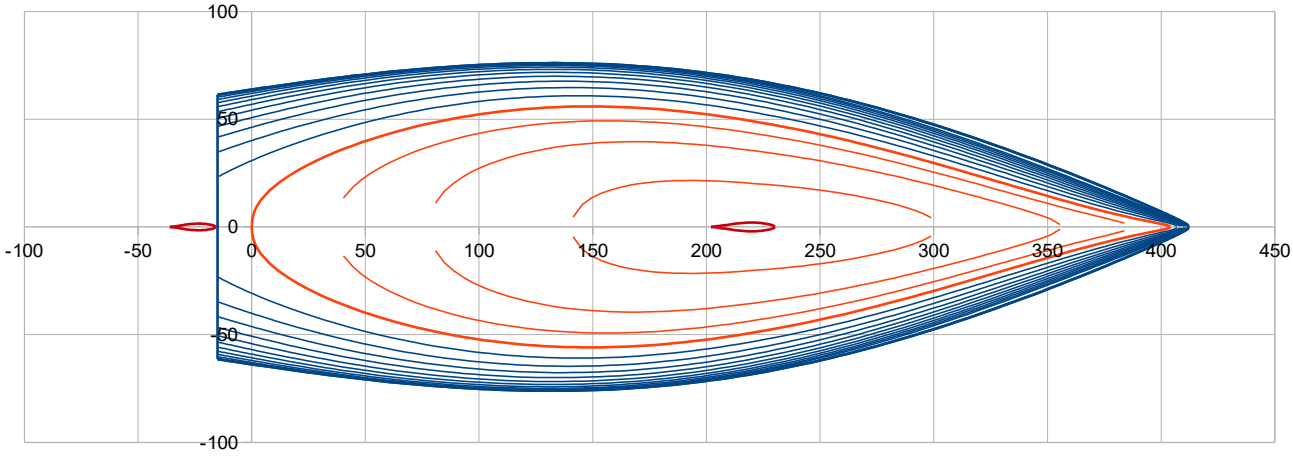
- **D1,1, D1,2, D1,3, D1,4, D1,5, D1,6 :** a serie of dinghies by progressively decreasing the waterline beam.
  - With D1,6 : influence of crew various hiking postures
  - With D1,6 : influence of crew various weights
- **D2,1 , D2,2, D2,3 :** a serie with hard chine line and 3 shapes of topside section (concav, straight, convex)
- **D3 :** a version with tumblehome shape sections
- **D4 :** a version with scow bow
- **D5 :** a rowing/sailing version
- **D 505 :** inspired by the famous 505
- **D6 :** inspired by traditionnal APBY 14' catboat (Arey's Pond Boat Yard)

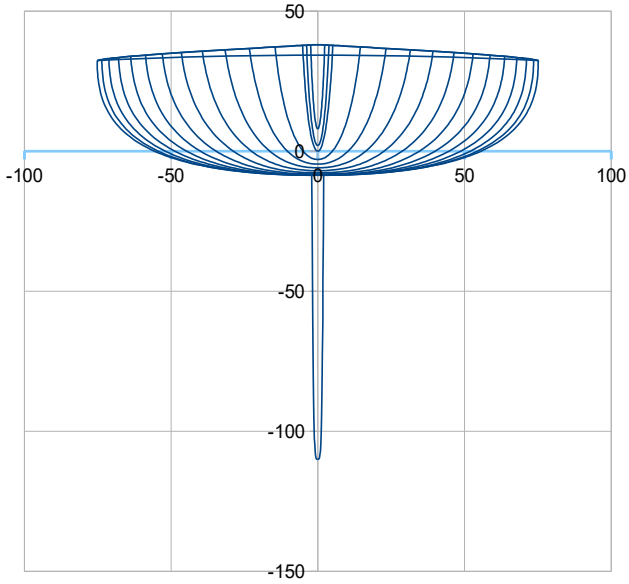
The serie D1,1 to D1,6 : with same crew weight (120 kg) and hiking posture (Y = 1m ; Z = 0,4m)

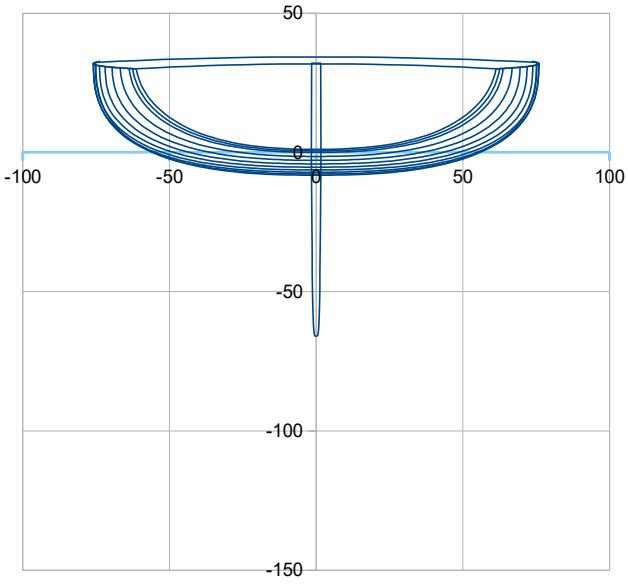
Dinghy D1,1 short presentation

Loa 4,27 m (14') ; Lwl 4,04 m ; B 1,52 m ; Bwl 1,12 m ; Draft 1,10 m ; Displacement of design : 161 kg (Dinghy 61 kg + average load 100 kg) - Sailplan : SA 11 m2 ; Spi 18,4 m2









Saiplan (common for D1,1 to D1,6) :

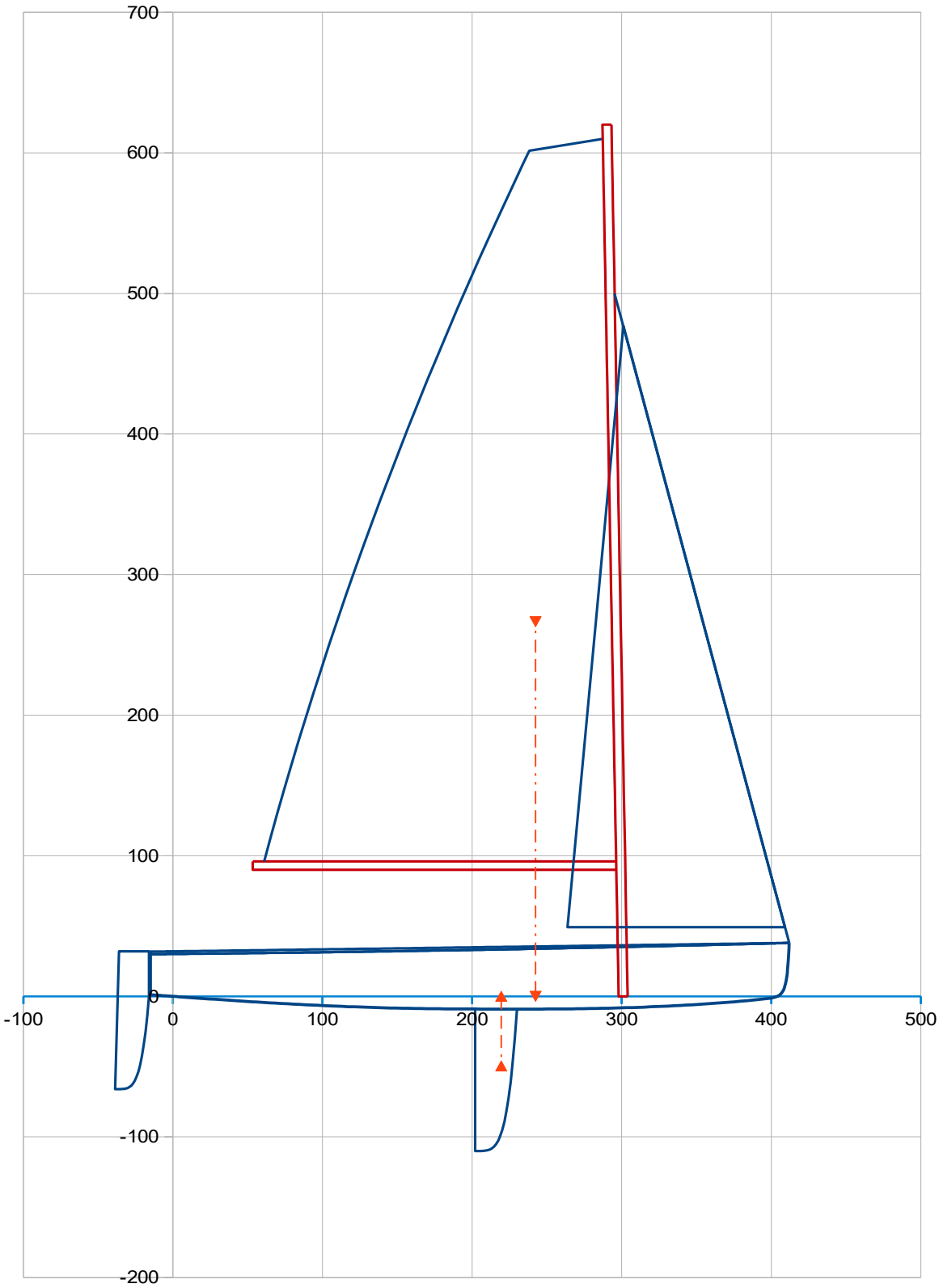
C - Sailplan – early stage definition

Data to enter		>> in feet
Xmast (m)	3,04	9,97
Zmast (m)	6,20	20,34
Zboom (m)	0,96	3,15
Lboom (m)	2,43	7,97
Z jib (m)	5,00	16,40
Jib overlap	130	%
Mast rake(°)	1,00	

(No jib : put Z jib = 0)

Results for the Sailplan					
Main sail (m2)	7,79	Jib (m2)	3,25	>> SA (m2)	11,0
Lead Xv – Xd (%)	6,8				
Sdaggerboard/Sv (%)	2,08			Spi (m2) ~	18,4
Srudder/Sv (%)	1,05				
Sv/Sw	3,10				

For Gene-VPP :	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)
(Main + Fore triangle)	10,28	2,72	0,35	6,10	7,79	18,4	2,73



Speed prediction of D1,1, with a load (i.e. crew weight) of 120 kg hiking at Y = 1 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 120 kg at X = 1,62 m (40% Lwl), Y = 1 m and Z = 0,40 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*61,19*	*1,758*	*0,463*	*0*	*from the mass spreadsheet*
Load (kg)	**120,00**	**1,62**	**0,65**	**0,00**	Crew at center
			0,40	**1,00**	Crew at windward
Total >>> Mass (kg)	**181,19**	**1,667**	**0,587**	**0,000**	**Crew at center**
Disp. (m3)	**0,17677**		**0,421**	**0,662**	**Crew at windward**

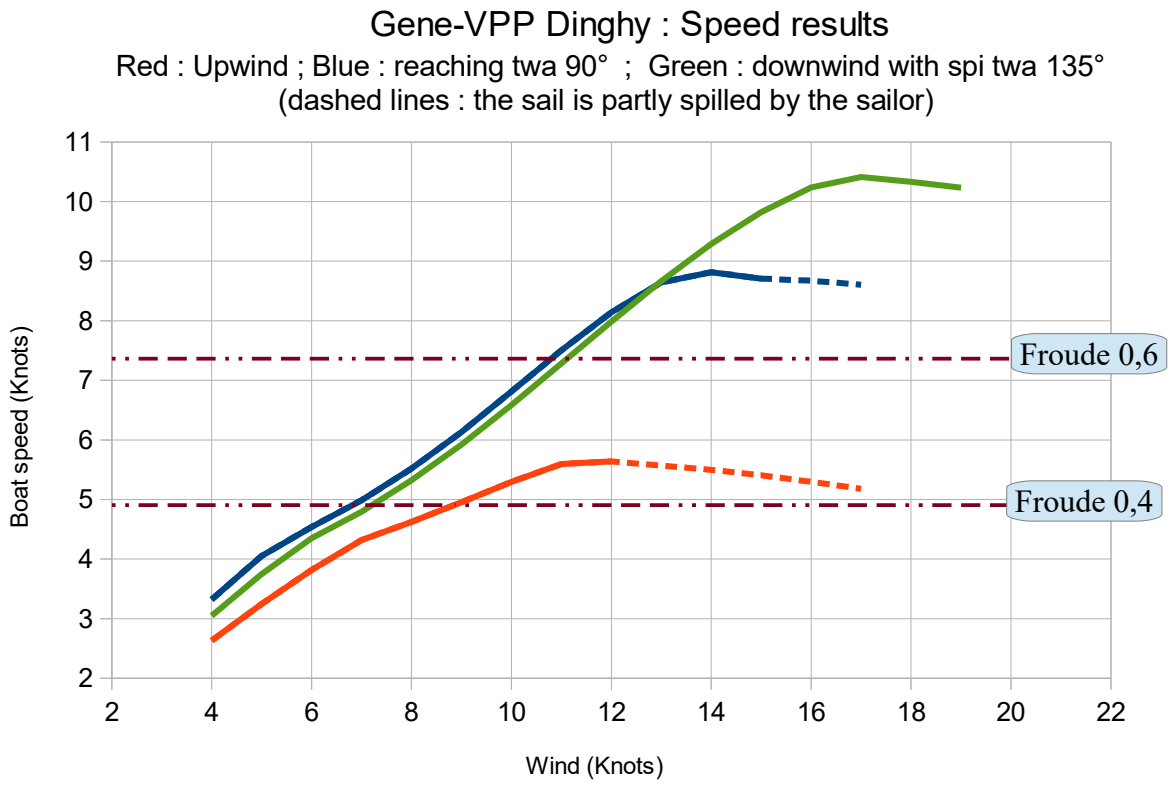
Computation of the RMs and the Sws :

Righting Moment RM (kN.m)			Wetted surface Sw (m2)		
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°
1,177	1,439	1,404	4,00	3,49	3,12

Input data table for Gene-VPP Dinghy :

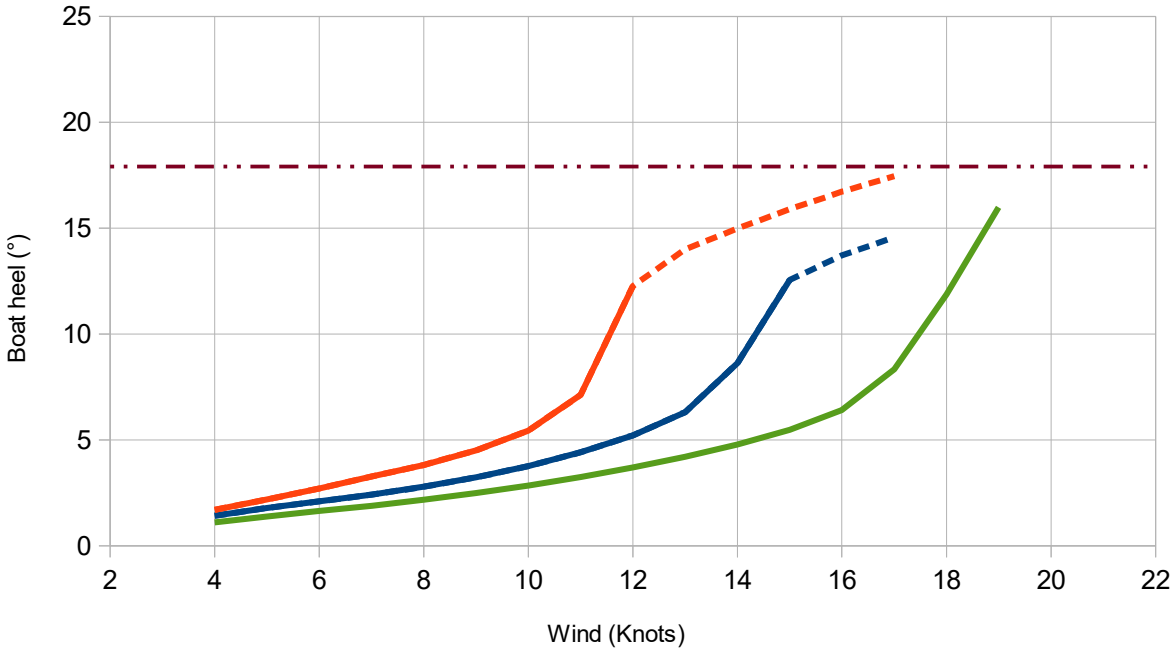
For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
4,06	1,15	0,09	1,52	0,55	45,30	3,21	10,28	2,72	0,35	6,10	7,79	18,43	2,73	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,00502	0,48	0,28					0,00330	0,24	0,20	181	1,10			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
1,177	1,439	1,404	4,00	3,49	3,12									

Gene-VPP output for D1,1 :

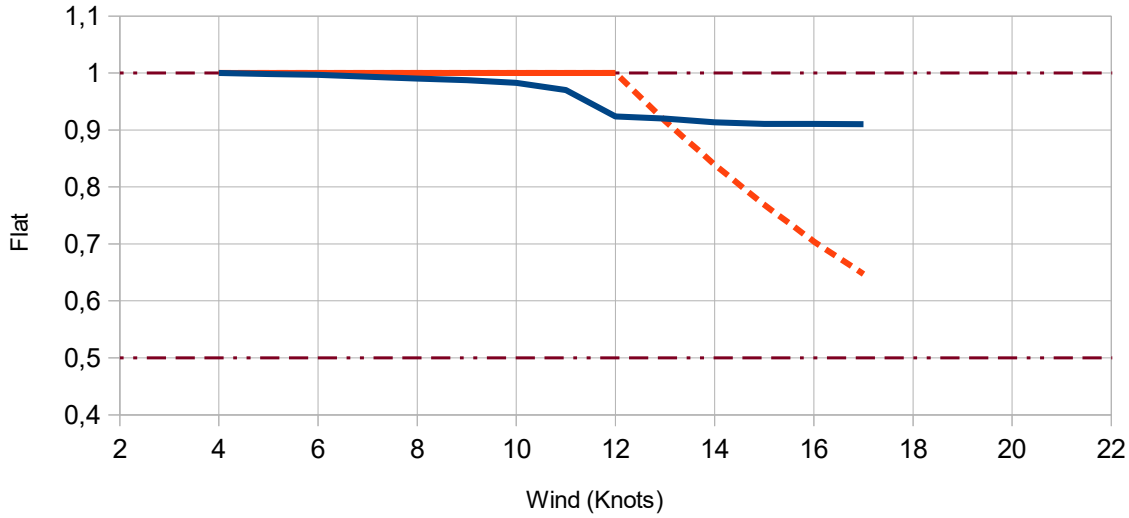


Gene-VPP Dinghy : Heel results

Red : Upwind ; Blue : reaching twa 90° ; Green : downwind with spi twa 135°
(dashed lines : the sail is partly spilled by the sailor)

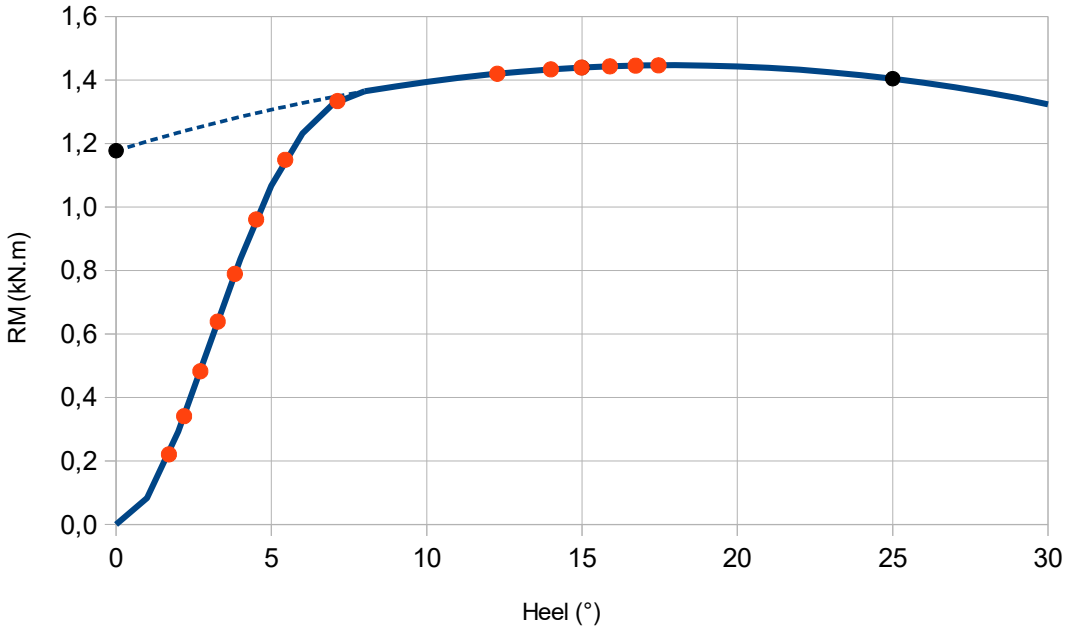


Gene-VPP Dinghy : Spill (Red) and Flat (Blue) optimum when upwind



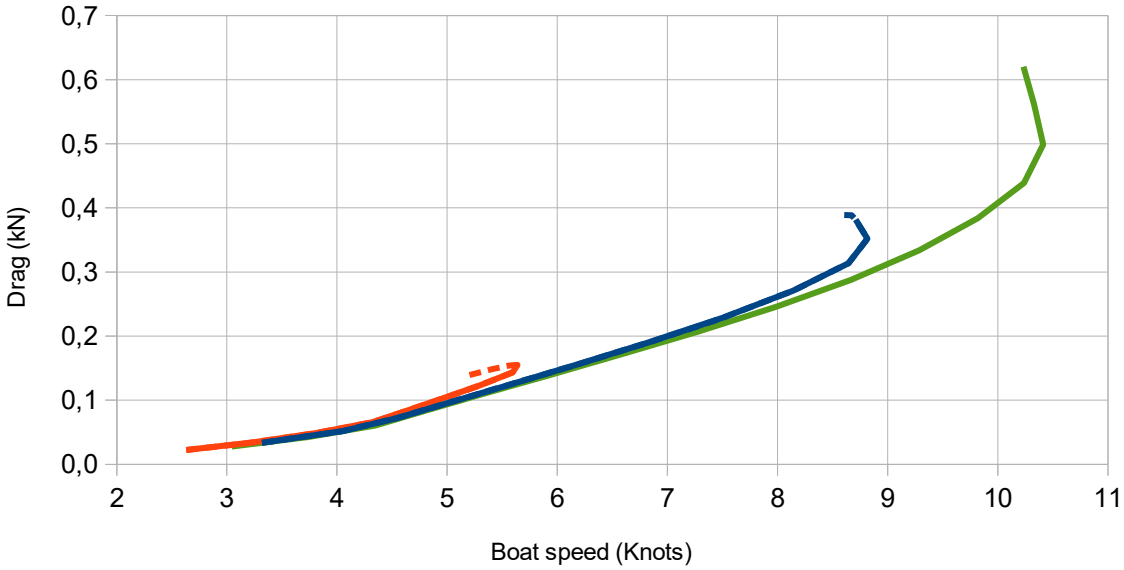
Gene-VPP Dinghy : Righting Moment RM versus heel angle

Black points : RM input values ; Blue : RM programmed function
Red points : SA-VPP output when upwind



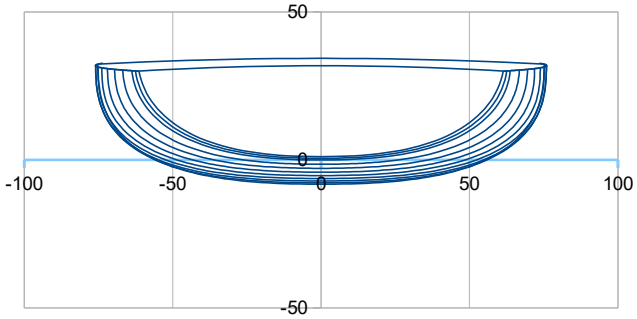
Gene-VPP Dinghy : Drag versus boat speed

Red : Upwind ; Blue : reaching twa 90° ; Green : downwind with spi twa 135°
(dashed lines : the sail is partly spilled by the sailor)

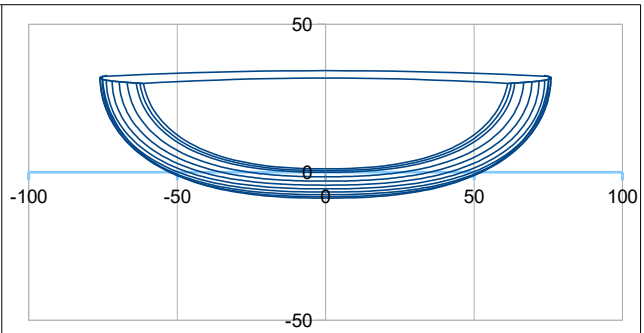


Speed prediction results for the serie D1,1 to D1,6 with a crew weight of 120 kg hiking at Y = 1 m

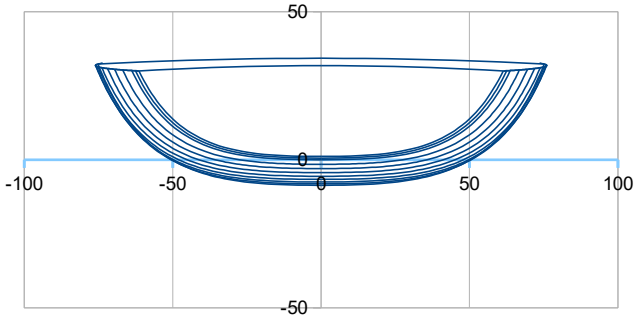
Remind : the dinghies D1,1 to D1,6 share the same length (overall and waterline) , hull beam, sheer line, light weight, they differ by their beam waterline, hull body draft and sections shape.



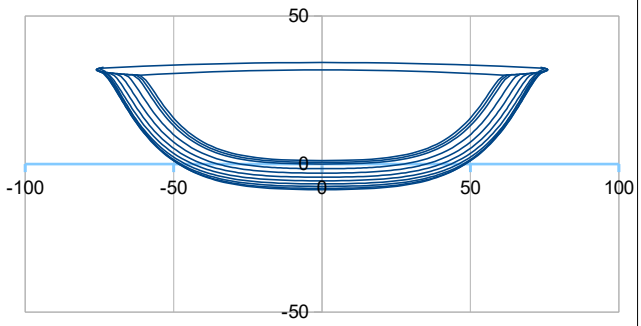
D1,1 with load 120 kg > Bwl = 1,15 m



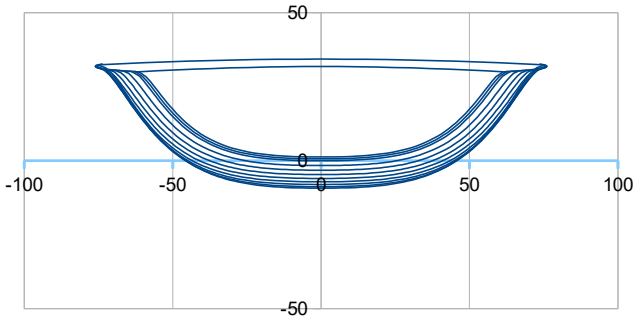
D1,2 with load 120 kg > Bwl = 1,09 m



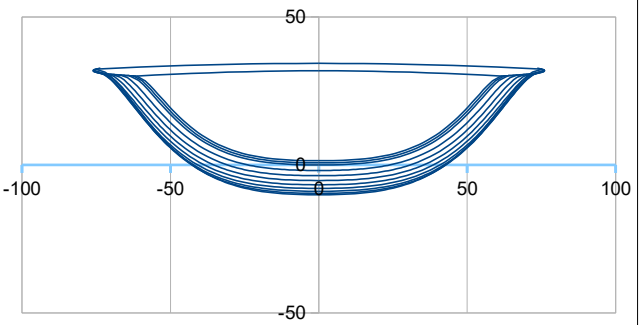
D1,3 with load 120 kg > Bwl = 1,04 m



D1,4 with load 120 kg > Bwl = 1,00 m



D1,5 with load 120 kg > Bwl = 0,95 m



D1,6 with load 120 kg > Bwl = 0,89 m

Speed prediction with wind 7 knots :

Wind 7 Knts	Upwind	Reaching	Downwind
D1,1	4,32	4,99	4,79
D1,2	4,36	5,05	4,84
D1,3	4,37	5,08	4,85
D1,4	4,36	5,08	4,85
D1,5	4,41	5,16	4,91
D1,6	**4,47**	**5,27**	**4,98**

>>> D1,6 is clearly the faster in all conditions

Speed prediction with wind 11 knots :

Wind 11Knts	Upwind	Reaching	Downwind
D1,1	5,59	7,50	7,28
D1,2	**5,62**	7,67	7,38
D1,3	5,61	7,74	7,43
D1,4	5,59	7,80	7,46
D1,5	5,58	7,99	7,59
D1,6	5,56	**8,23**	**7,74**

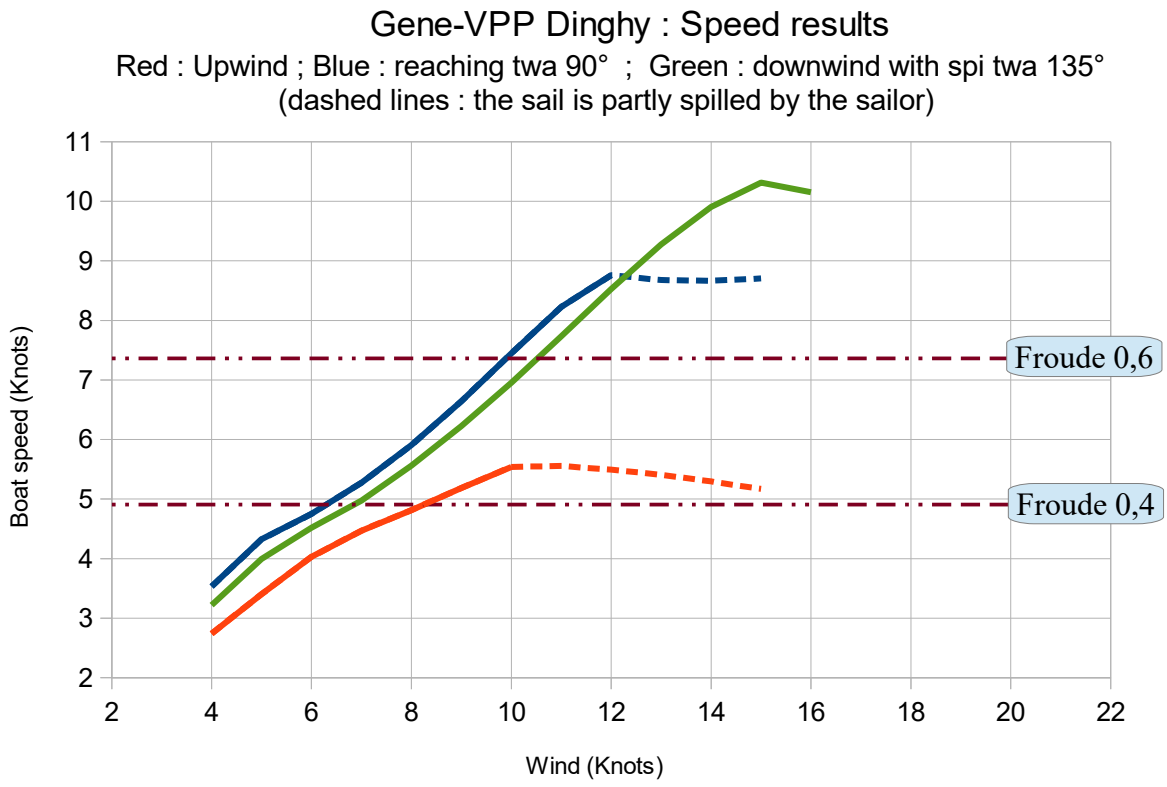
>>> by Reaching and Downwind, D1,6 is still much faster
>>> Upwind, all speeds are very close with a slight advantage for the D1,2

Speed prediction with wind 15 knots :

Wind 15 Knts	Upwind	Reaching	Downwind
D1,1	**5,41**	**8,71**	9,82
D1,2	5,35	8,66	9,97
D1,3	5,26	8,64	10,02
D1,4	5,26	8,63	10,06
D1,5	5,25	8,64	10,21
D1,6	5,18	**8,71**	**10,31**

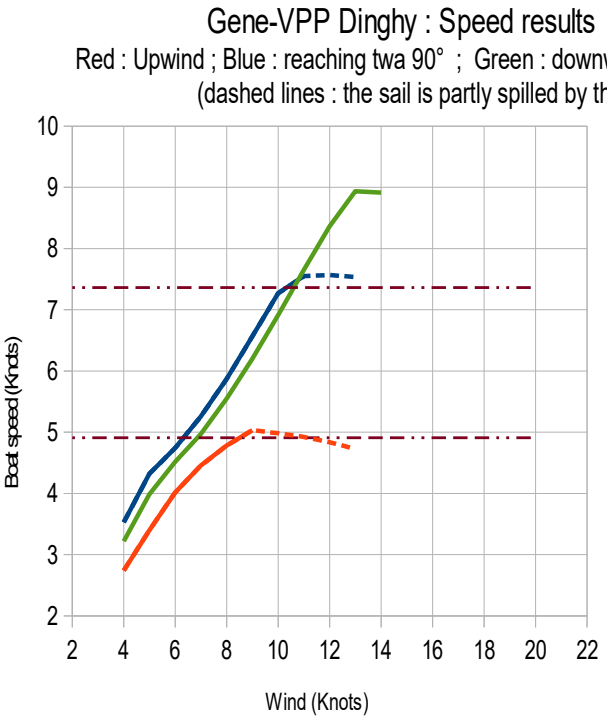
>>> D1,1 is the fastest upwind thanks to its hull more powerful
>>> D1,6 is the faster Downwind
>>> By reaching, all the speeds are very close with a slight advantage to both D1,1 and D1,6

VPP output for D1,6

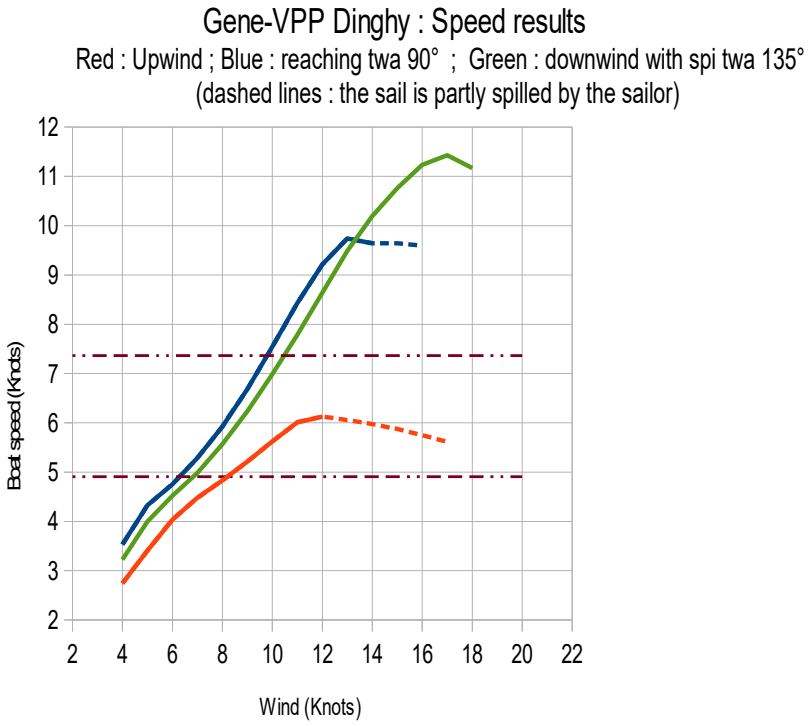


Influence of the hiking extension >>> D1,6 with 120 kg at Y = 0,75 m and Y = 1,25 m

With hiking Y = 0,75 m



With hiking Y = 1,25 m



Wind 7 Knts	Upwind	Reaching	Downwind
D1,6 Y 0,75m	4,46	5,26	4,97
D1,6 Y1,00m	4,47	5,27	4,98
D1,6 Y 1,25m	4,48	5,28	4,98

>>> By 7 Knots of wind, the hiking maximum capacity has no influence because not used.

Wind 11Knts	Upwind	Reaching	Downwind
D1,6 Y 0,75m	4,93	7,55	7,65
D1,6 Y1,00m	5,56	8,23	7,74
D1,6 Y 1,25m	6,01	8,43	7,79

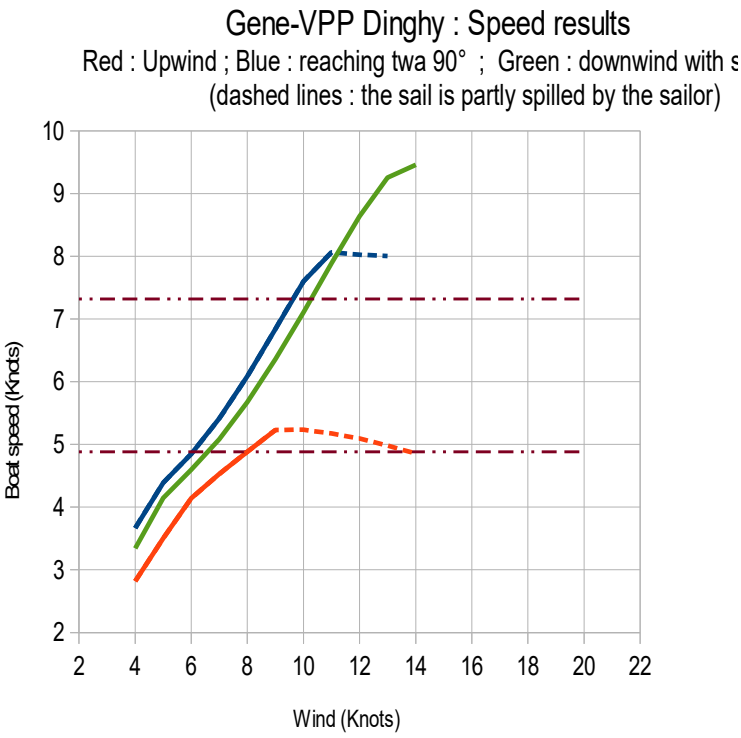
>>> By 11 Knots, there is a net advanatge, especially from Y 0,75 m to Y 1,0 m

Wind 15 Knts	Upwind	Reaching	Downwind
D1,6 Y 0,75m	« Heel »	« Heel »	« Heel »
D1,6 Y1,00m	5,18	8,71	10,31
D1,6 Y 1,25m	5,88	9,64	10,76

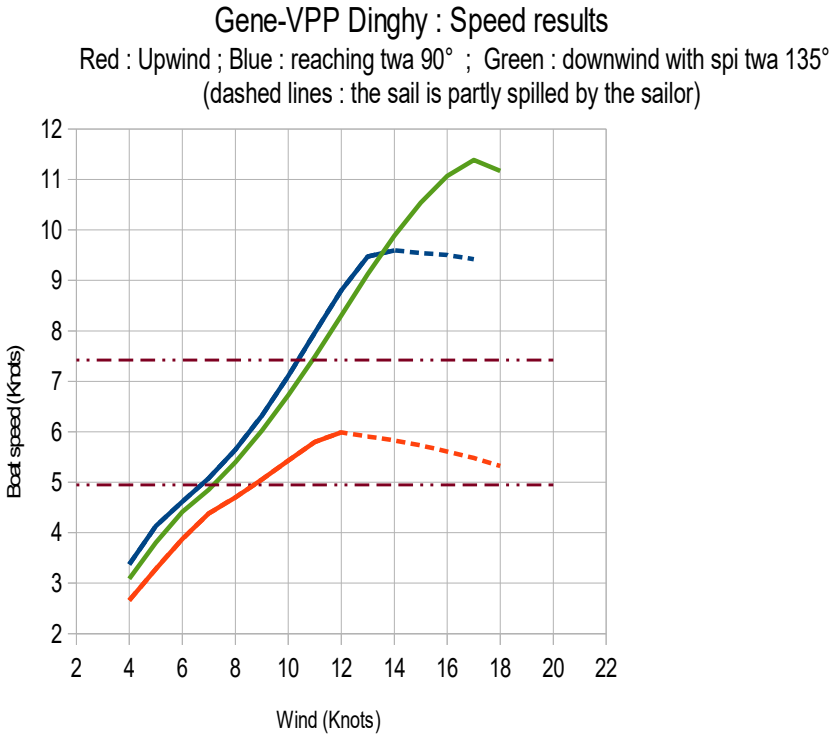
>>> By 15 Knots, the gain with the hiking Y 1,25 m is important. With just Y 0,75 m, the boat is hardly mastered.

Influence of the crew weight >>> D1,6 with 100 kg and 150 kg crew weight , both at Y = 1 m

With crew weight 100 kg



With crew weight 150 kg



Wind 7 Knts	**Upwind**	**Reaching**	**Downwind**
D1,6 100 kg	4,53	5,41	5,08
D1,6 120 kg	4,47	5,27	4,98
D1,6 150 kg	4,38	5,08	4,85

>>> The light crew has an advantage, mostly linked to less wetted surface.

Wind 11Knts	**Upwind**	**Reaching**	**Downwind**
D1,6 100 kg	5,18	8,06	7,89
D1,6 120 kg	5,56	8,23	7,74
D1,6 150 kg	5,80	7,96	7,49

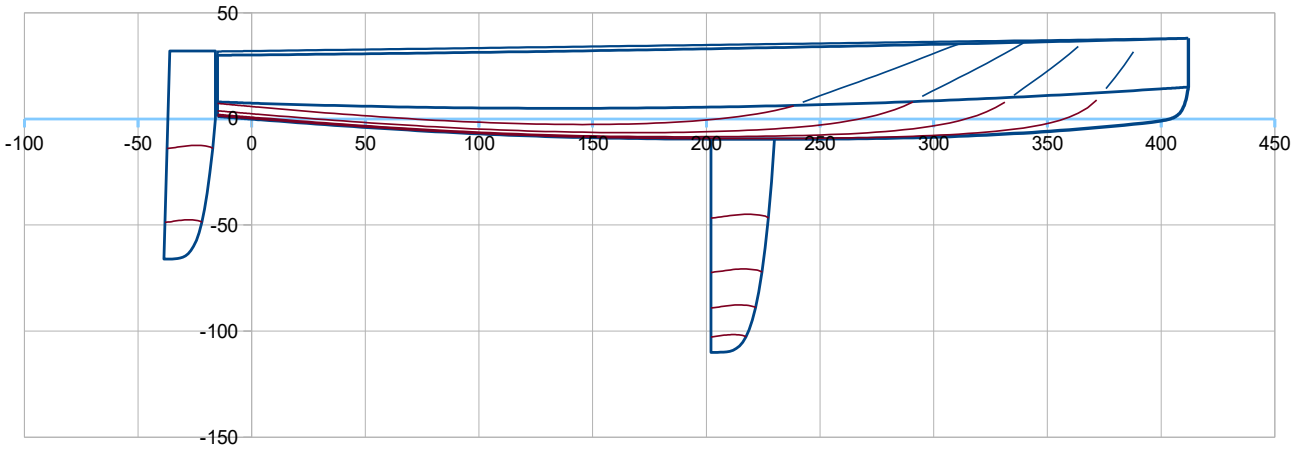
>>> The heavier crew has the advantage when upwind, but the medium weight crew is faster when reaching and the light crew the faster when downwind.

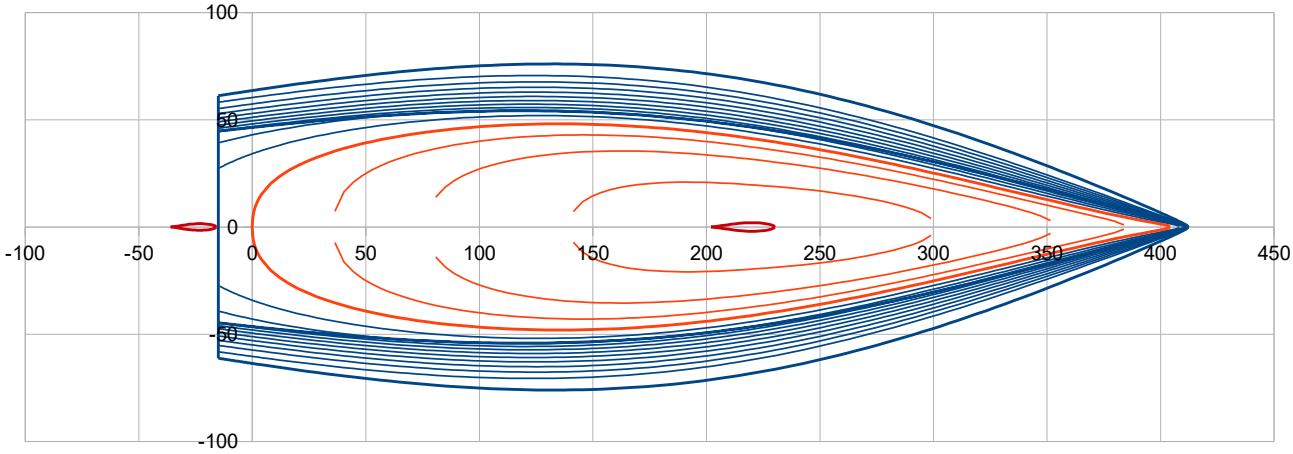
Wind 15 Knts	**Upwind**	**Reaching**	**Downwind**
D1,6 100 kg	« Heel »	« Heel »	« Heel »
D1,6 120 kg	5,18	8,71	10,31
D1,6 150 kg	5,73	9,54	10,54

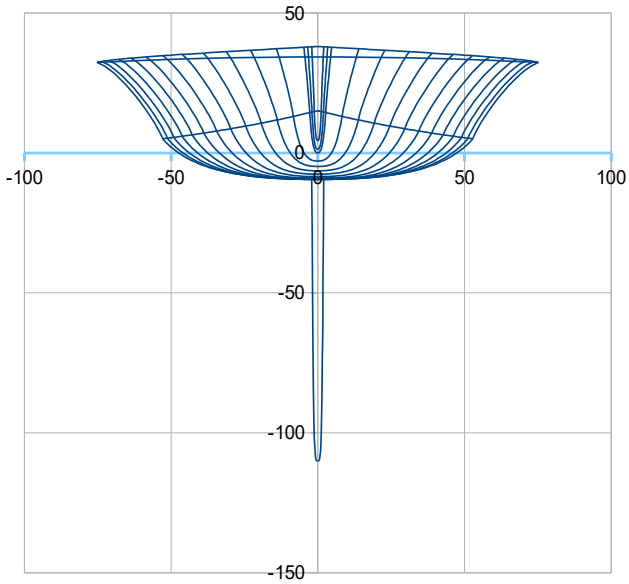
>>> The heavier crew is faster in all conditions, the light crew hardly mastered the dinghy, even downwind (at twa 135°) with the spi.

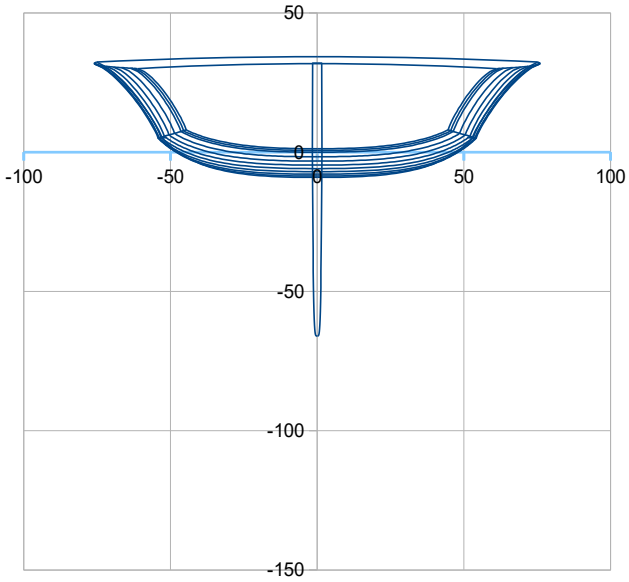
Dinghy D2,1 short presentation

Loa 4,27 m (14') ; Lwl 4,04 m ; B 1,52 m ; Bwl 0,96 m ; Draft 1,10 m ; Displacement of design : 160 kg (Dinghy 60 kg + average load 100 kg) - Sailplan : SA 11 m2 ; Spi 18,4 m2









Speed prediction of D2,1 with a load (i.e. crew weight) of 120 kg hiking at Y = 1 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 120 kg at X = 1,62 m (40% Lwl), Y = 1 m and Z = 0,40 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*60,12*	*1,758*	*0,476*	*0*	*from the mass spreadsheet*
Load (kg)	**120,00**	**1,62**	**0,65**	**0,00**	Crew at center
			0,40	**1,00**	Crew at windward
Total >>> Mass (kg)	**180,12**	**1,666**	**0,592**	**0,000**	**Crew at center**
Disp. (m3)	**0,17573**		**0,426**	**0,666**	**Crew at windward**

Computation of the RMs and the Sws :

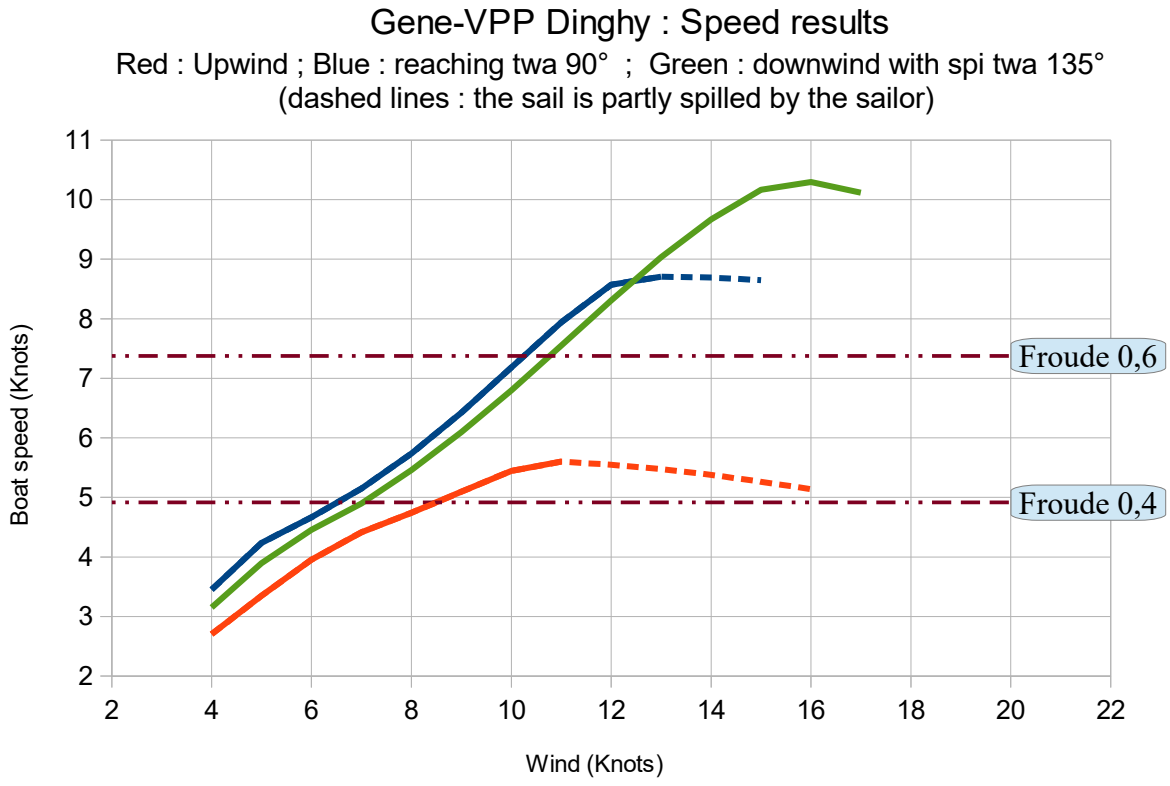
Righting Moment RM (kN.m)		
RM0°	RM15°	RM25°
1,177	1,279	1,210

Wetted surface Sw (m2)		
Sw0°	Sw15°	Sw25°
3,69	3,32	3,16

>>> Input data table for Gene-VPP Dinghy :

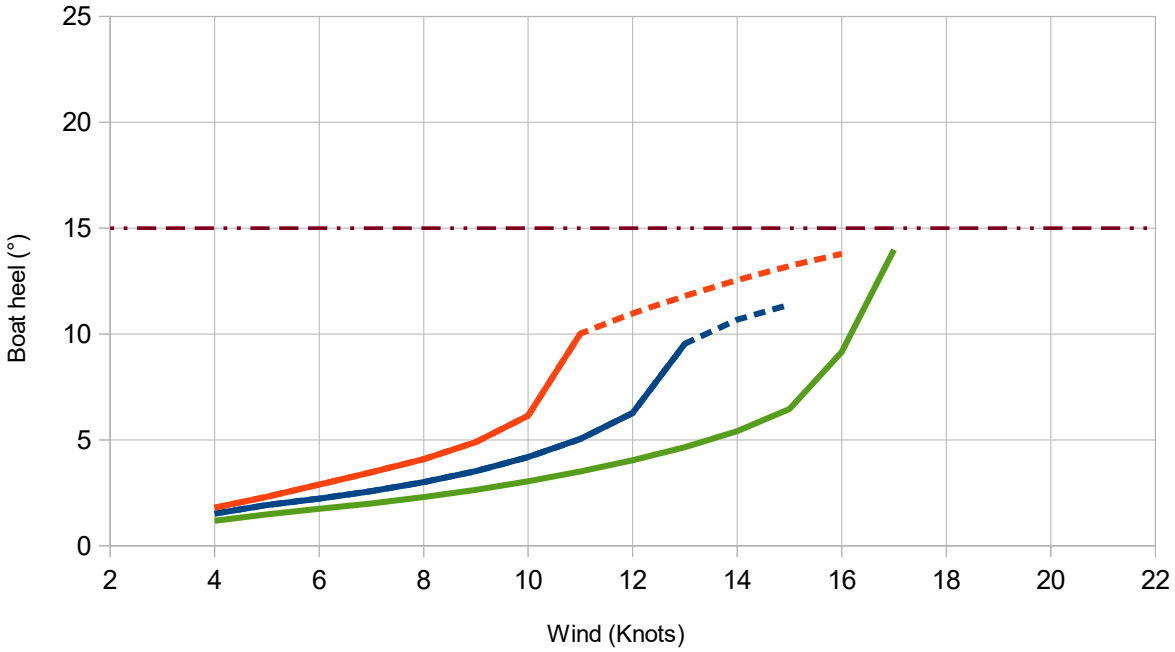
For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
4,08	0,99	0,10	1,52	0,57	45,11	2,85	10,28	2,72	0,35	6,10	7,79	18,43	2,73	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,00498	0,48	0,28					0,00330	0,24	0,20	180	1,10			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
1,177	1,279	1,210	3,69	3,32	3,16									

Gene-VPP output for D2,1 :

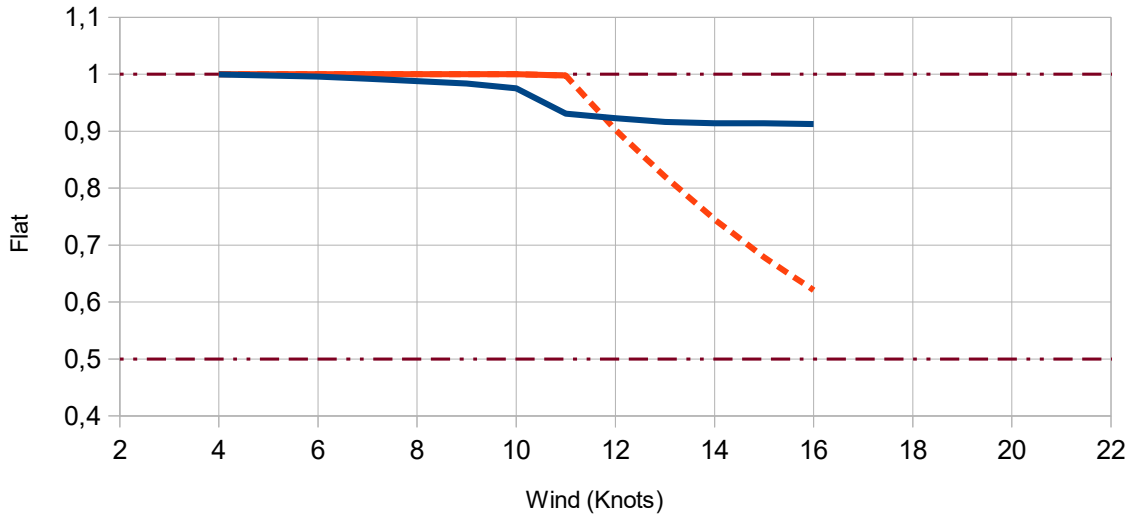


Gene-VPP Dinghy : Heel results

Red : Upwind ; Blue : reaching twa 90° ; Green : downwind with spi twa 135°
(dashed lines : the sail is partly spilled by the sailor)

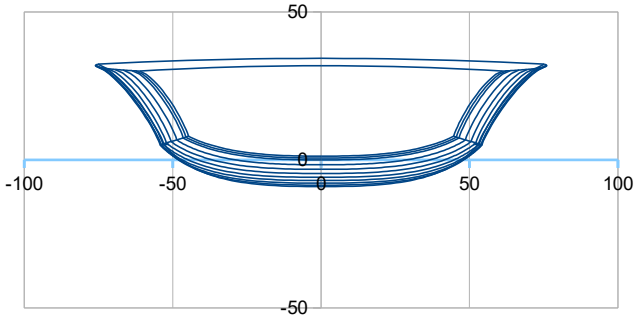


Gene-VPP Dinghy : Spill (Red) and Flat (Blue) optimum when upwind

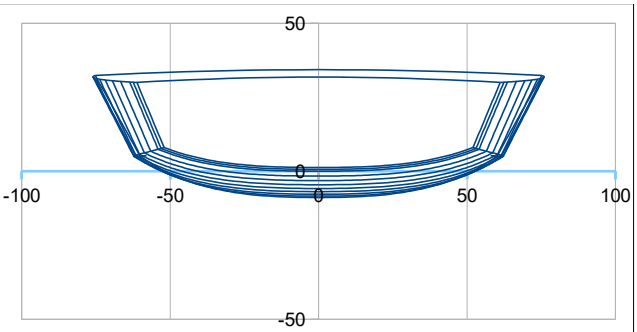


Speed prediction results for the serie D2,1 to D2,3 with a crew weight of 120 kg hiking at Y = 1 m

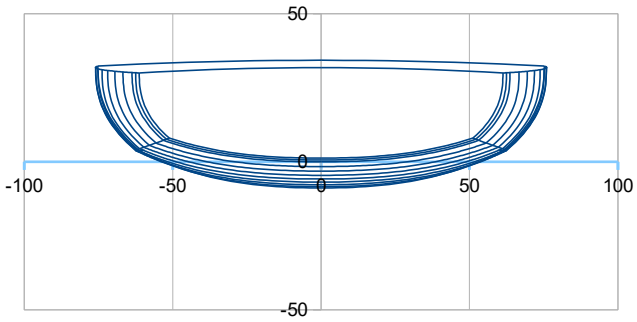
Remind : the dinghies D2,1 to D2,3 share the same length (overall and waterline), hull beam, sheer line and hard chine line, light weight, same sailplan , they differ by their beam waterline, hull body draft and topsides section shape.



D2,1 with load 120 kg > Bwl = 0,99 m



D2,2 with load 120 kg > Bwl = 1,10 m



D2,3 with load 120 kg > Bwl = 1,12 m

Speed prediction with wind 7 knots :

Wind 7 Knts	Upwind	Reaching	Downwind
D2,1	4,42	5,15	4,90
D2,2	4,39	5,10	4,87
D2,3	4,35	5,04	4,82

Speed prediction with wind 11 knots :

Wind 11Knts	Upwind	Reaching	Downwind
D2,1	5,60	7,94	7,55
D2,2	5,66	7,77	7,45
D2,3	5,64	7,63	7,36

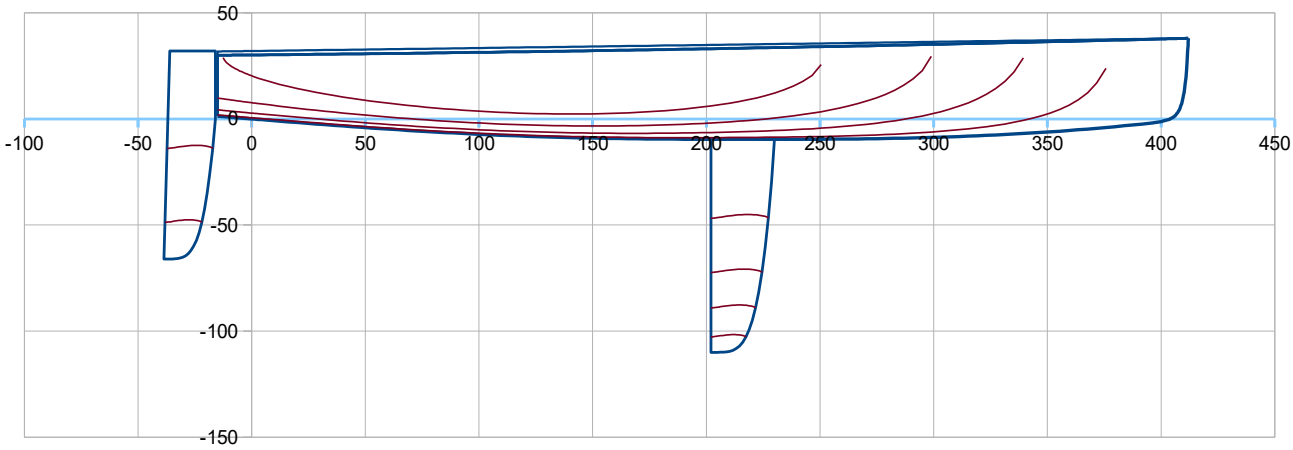
Speed prediction with wind 15 knots :

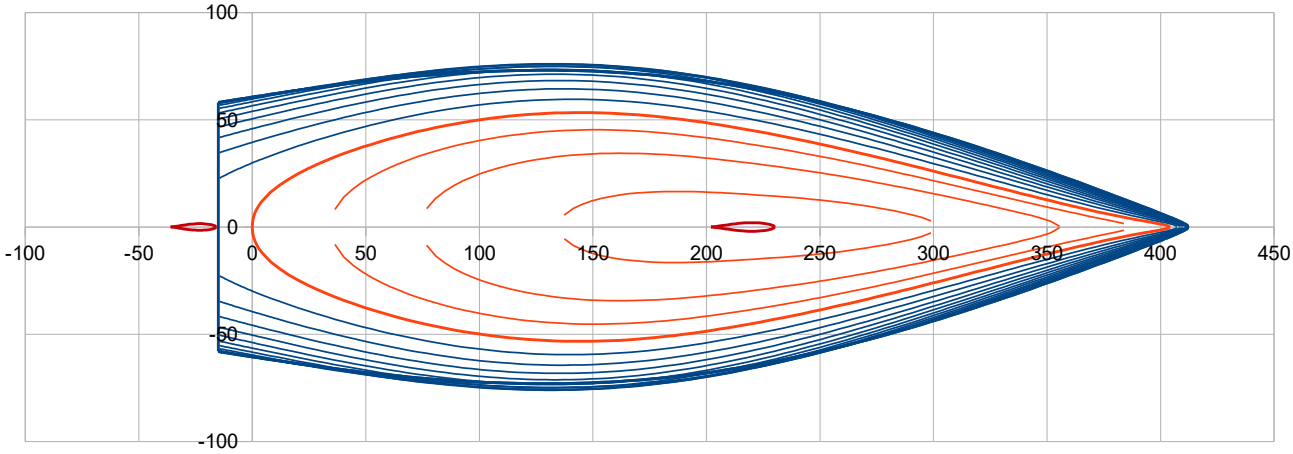
Wind 15 Knts	Upwind	Reaching	Downwind
D2,1	5,26	8,65	10,16
D2,2	5,33	8,74	10,04
D2,3	5,41	8,72	9,94

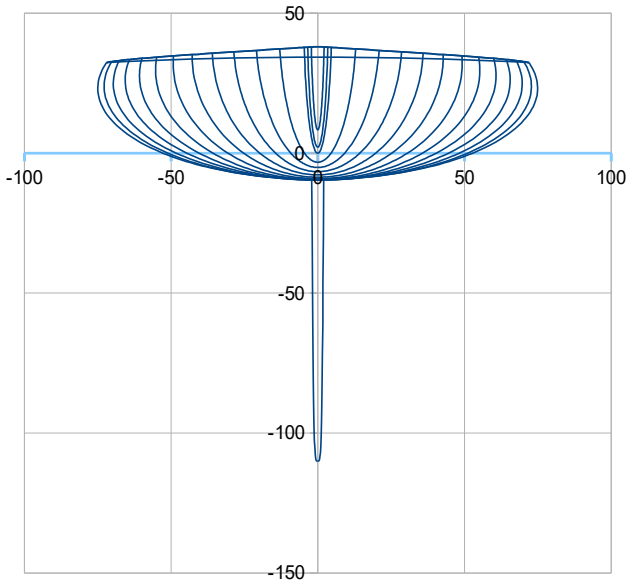
Dinghy with sections tumblehome shape

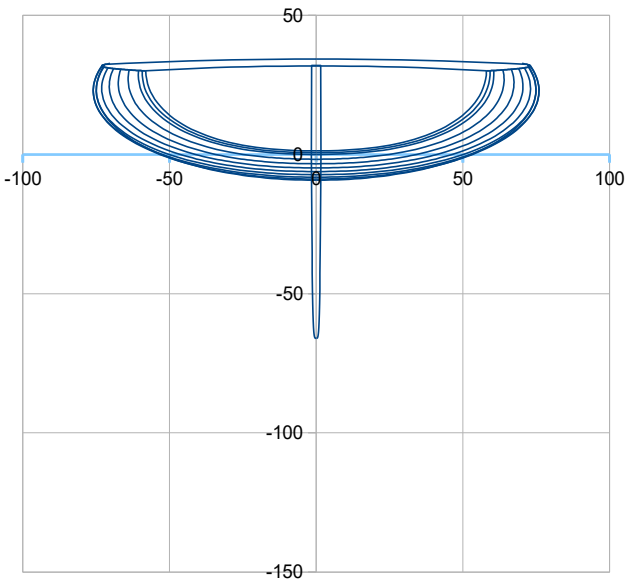
Dinghy D3 short presentation

Loa 4,27 m (14') ; Lwl 4,04 m ; B 1,52 m ; Bwl 1,07 m ; Draft 1,10 m ; Displacement of design : 160 kg (Dinghy 60 kg + average load 100 kg) - Sailplan : SA 11 m2 ; Spi 18,4 m2









Speed prediction of D3 , with a load (i.e. crew weight) of 120 kg hiking at Y = 1 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 120 kg at X = 1,62 m (40% Lwl), Y = 1 m and Z = 0,40 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*59,94*	*1,754*	*0,469*	*0*	*from the mass spreadsheet*
Load (kg)	**120,00**	**1,62**	**0,65**	**0,00**	Crew at center
			0,40	**1,00**	Crew at windward
Total >>> Mass (kg)	**179,94**	**1,665**	**0,590**	**0,000**	**Crew at center**
Disp. (m3)	**0,17555**		**0,423**	**0,667**	**Crew at windward**

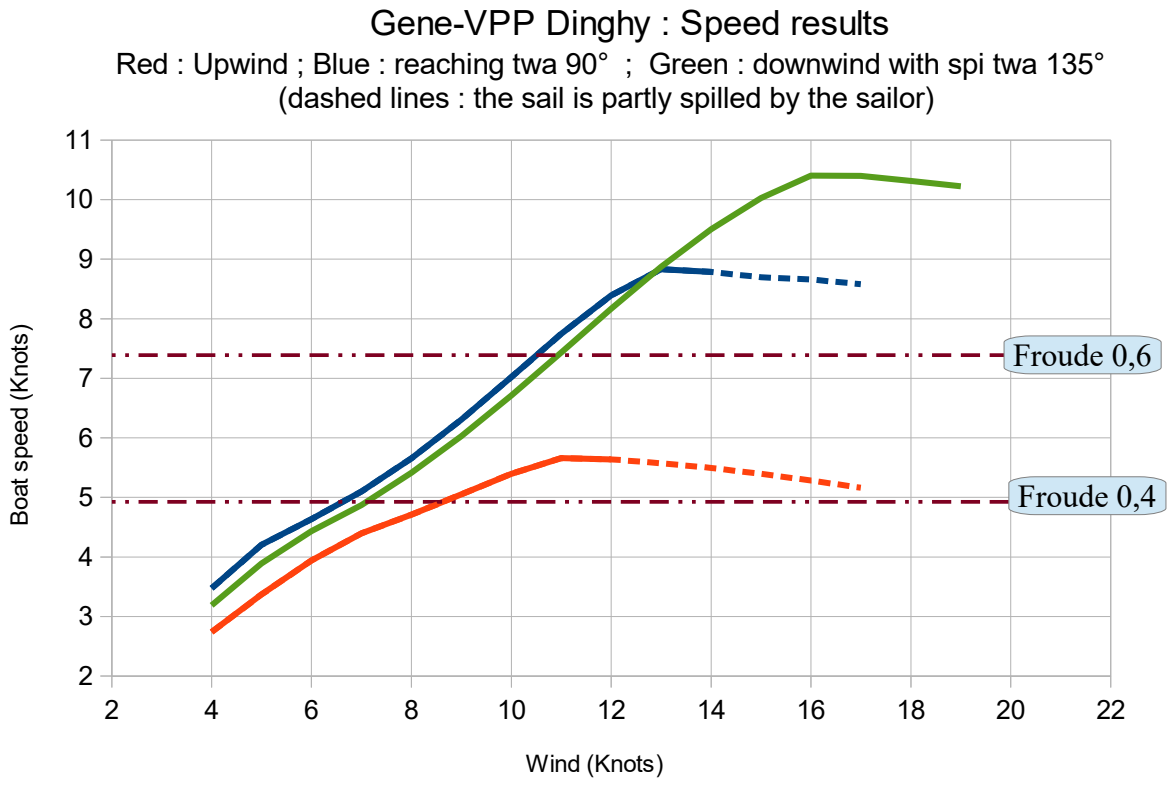
Computation of the RMs and the Sws :

Righting Moment RM (kN.m)				Wetted surface Sw (m2)		
RM0°	RM15°	RM25°		Sw0°	Sw15°	Sw25°
1,177	1,392	1,374		3,81	3,47	3,13

>>> Input data table for Gene-VPP Dinghy :

For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
4,09	1,11	0,10	1,46	0,54	44,89	2,99	10,28	2,72	0,35	6,10	7,79	18,43	2,73	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,00497	0,48	0,28					0,00330	0,24	0,20	180	1,11			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
1,177	1,392	1,374	3,81	3,47	3,13									

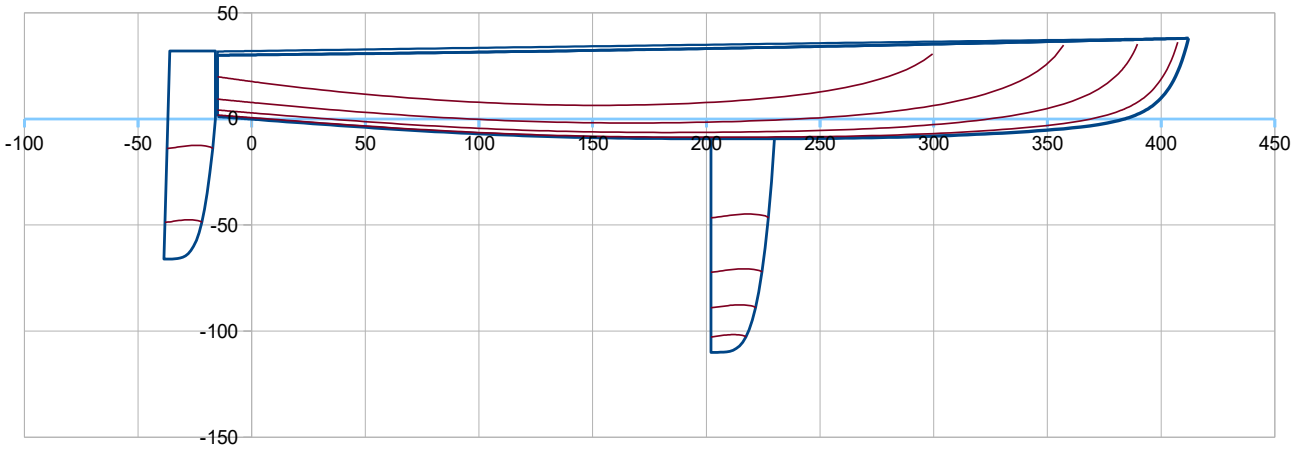
Gene-VPP output for D3 :

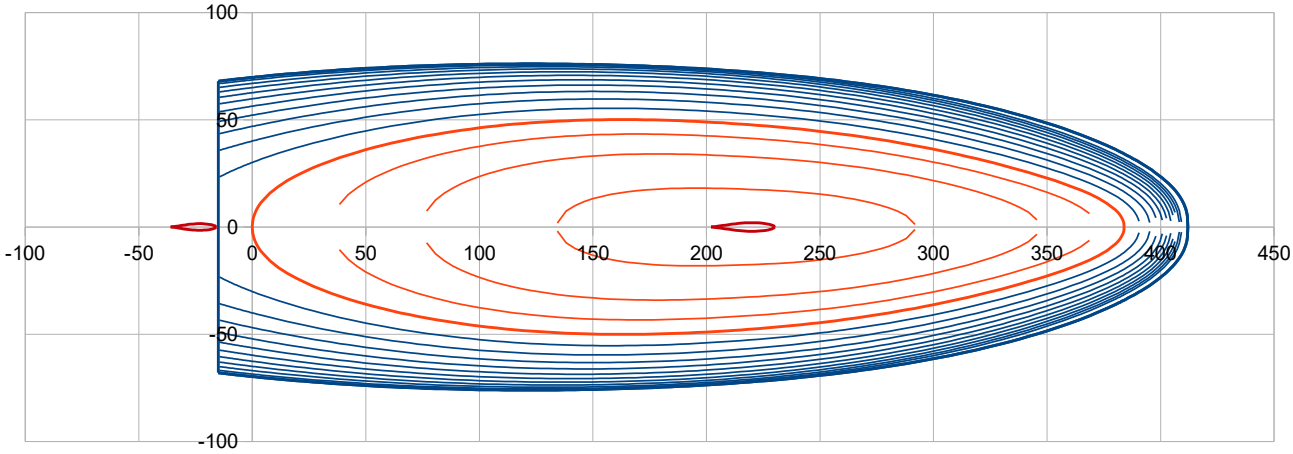


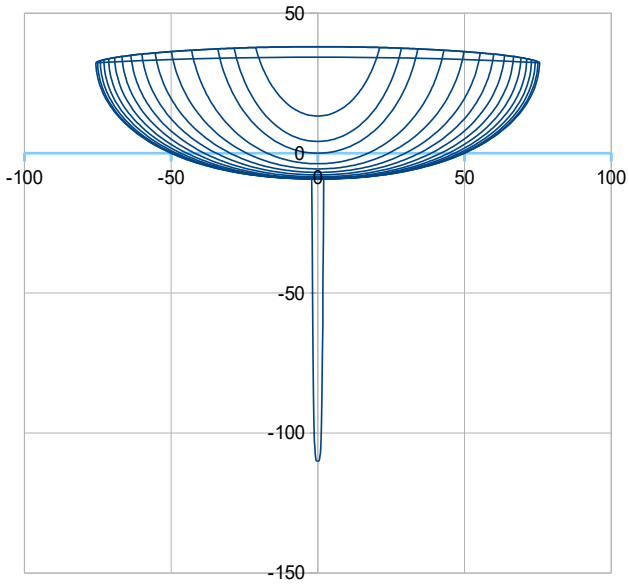
Dinghy with scow shape

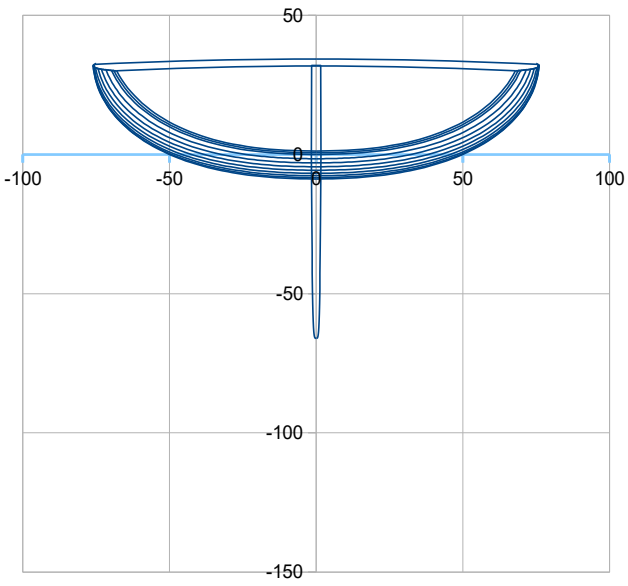
Dinghy D4 short presentation

Loa 4,27 m (14') ; Lwl 3,84 m ; B 1,52 m ; Bwl 0,97 m ; Draft 1,00 m ; Displacement of design : 164 kg (Dinghy 64 kg + average load 100 kg) - Sailplan : SA 11 m2 ; Spi 18,4 m2









Speed prediction of D4 , with a load (i.e. crew weight) of 120 kg hiking at Y = 1 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 120 kg at X = 1,62 m (40% Lwl), Y = 1 m and Z = 0,40 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*64,05*	*1,806*	*0,454*	*0*	*from the mass spreadsheet*
Load (kg)	**120,00**	**1,62**	**0,65**	**0,00**	Crew at center
			0,40	**1,00**	Crew at windward
Total >>> Mass (kg)	**184,05**	**1,685**	**0,582**	**0,000**	**Crew at center**
Disp. (m3)	**0,17956**		**0,419**	**0,652**	**Crew at windward**

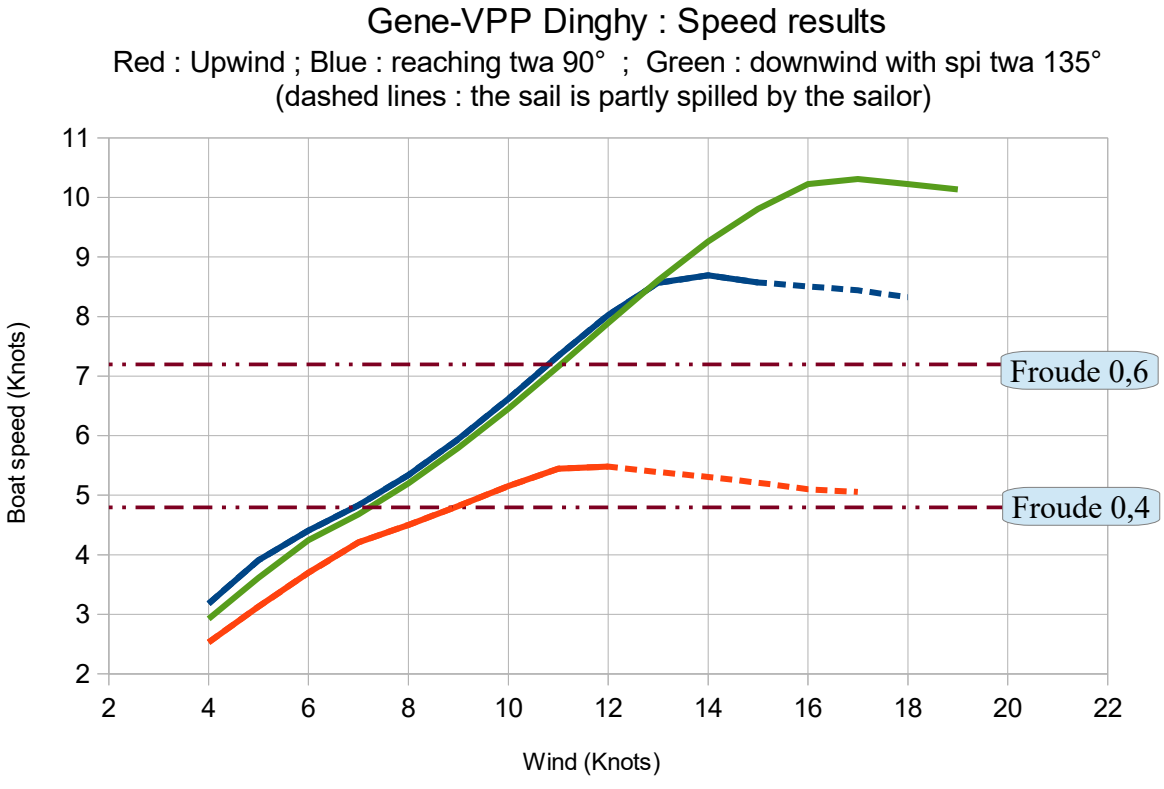
Computation of the RMs and the Sws :

Righting Moment RM (kN.m)				Wetted surface Sw (m2)		
RM0°	RM15°	RM25°		Sw0°	Sw15°	Sw25°
1,177	1,404	1,402		3,95	3,64	3,36

>>> Input data table for Gene-VPP Dinghy :

For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
3,88	1,04	0,10	1,52	0,62	47,86	3,16	10,28	2,72	0,35	6,10	7,79	18,43	2,73	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,00499	0,48	0,28					0,00330	0,24	0,20	184	1,10			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
1,177	1,404	1,402	3,95	3,64	3,36									

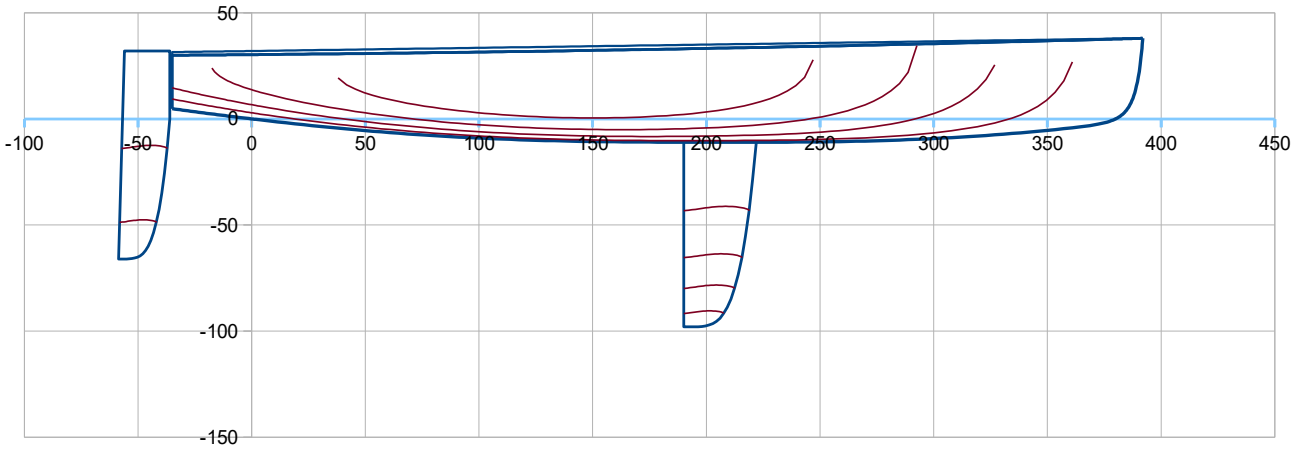
Gene-VPP output for D4 :

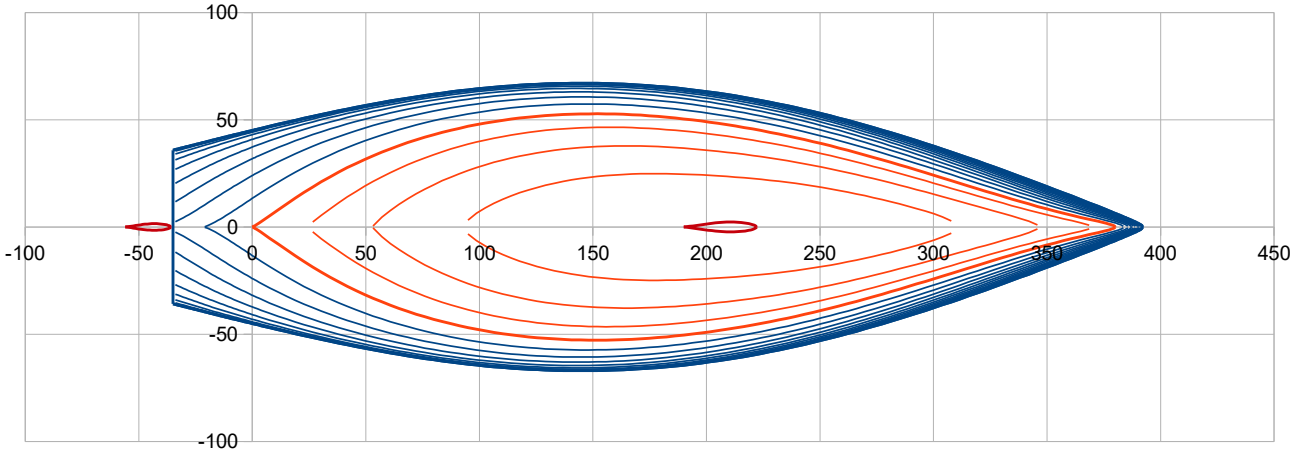


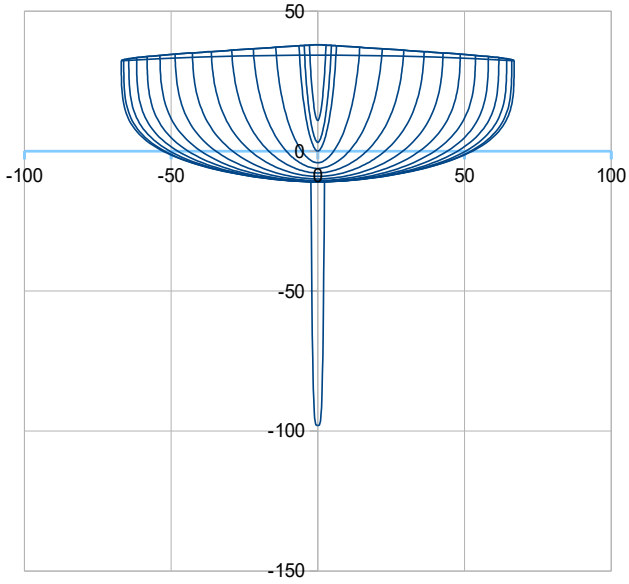
Dinghy for a solo rowing/sailing programme

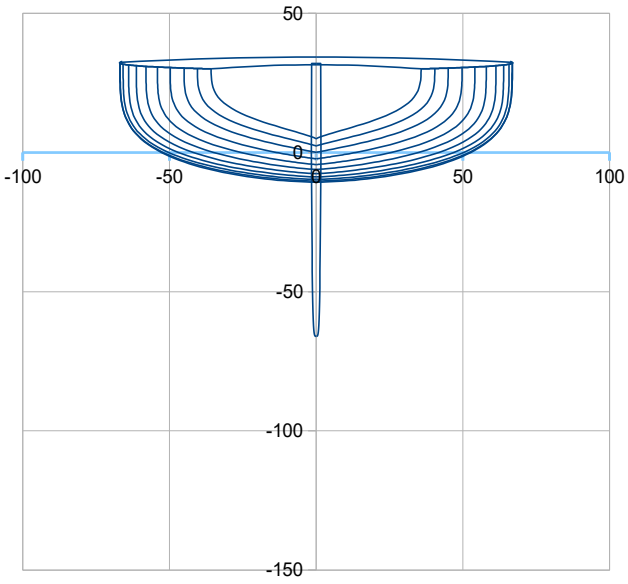
Dinghy D5 short presentation

Loa 4,27 m (14') ; Lwl 3,80 m ; B 1,34 m ; Bwl 1,06 m ; Draft 0,98 m ; Displacement of design : 175 kg (Dinghy 75 kg + average load 100 kg) - Sailplan : cat-boat with a sail of 5,5 m2 ; no spi









Speed prediction of D5, for a load of 100 kg (sailor 75 kg + equipment 25 kg) at an average hiking Y = 0,5 m and Z = 0,3 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 100 kg at X = 1,52 m (40% Lwl), Y = 0,5 and Z = 0,3 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*74,76*	*1,654*	*0,282*	*0*	*from the mass spreadsheet*
Load (kg)	**100,00**	**1,52**	**0,65**	**0,00**	Crew at center
			0,30	**0,50**	Crew at windward
Total >>> Mass (kg)	**174,76**	**1,578**	**0,493**	**0,000**	**Crew at center**
Disp. (m3)	**0,17050**		**0,292**	**0,286**	**Crew at windward**

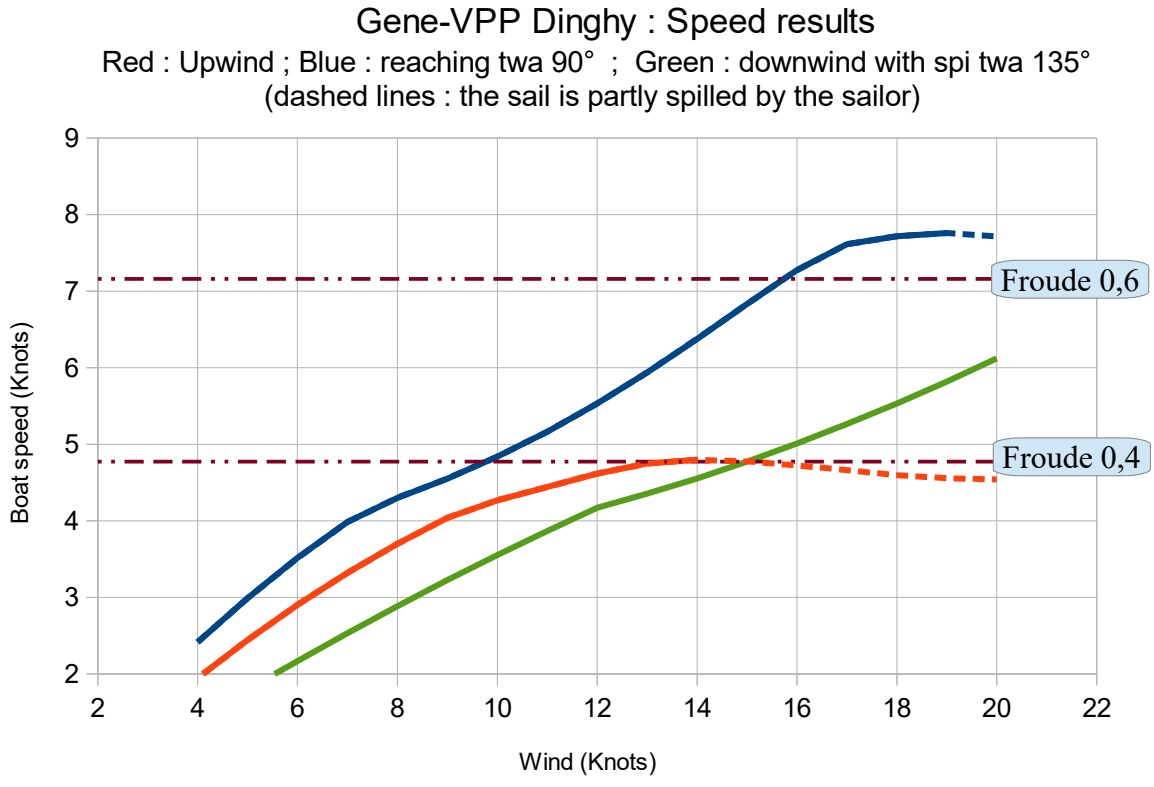
Computation of the RMs and the Sws :

Righting Moment RM (kN.m)			Wetted surface Sw (m2)		
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°
0,491	0,707	0,738	3,46	3,17	2,91

>>> Input data table for Gene-VPP Dinghy :

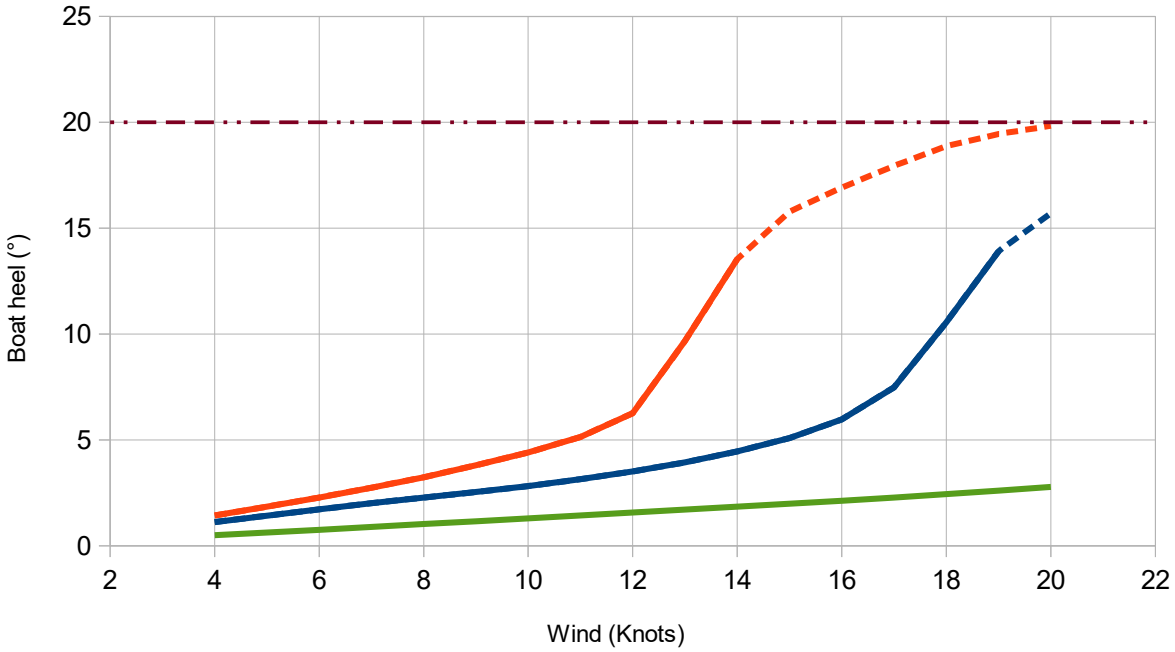
For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
3,84	1,07	0,11	1,34	0,53	47,67	2,65	5,47	2,23	0,35	4,40	5,47	0,00	2,23	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,00563	0,47	0,32					0,00330	0,24	0,20	175	0,98			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
0,491	0,707	0,738	3,46	3,17	2,91									

Gene-VPP output for D5 :

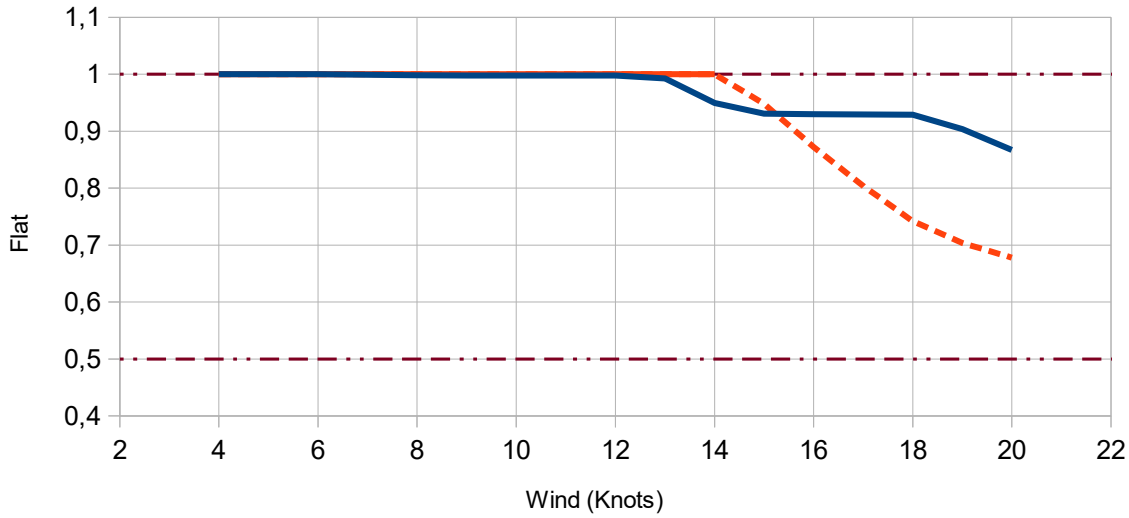


Gene-VPP Dinghy : Heel results

Red : Upwind ; Blue : reaching twa 90° ; Green : downwind with spi twa 135°
(dashed lines : the sail is partly spilled by the sailor)



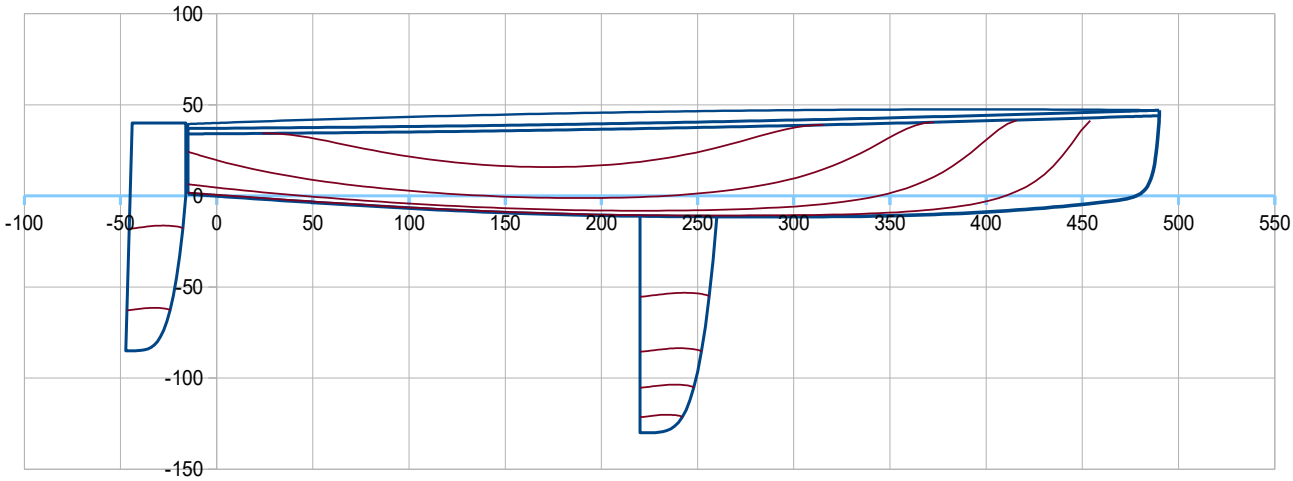
Gene-VPP Dinghy : Spill (Red) and Flat (Blue) optimum when upwind

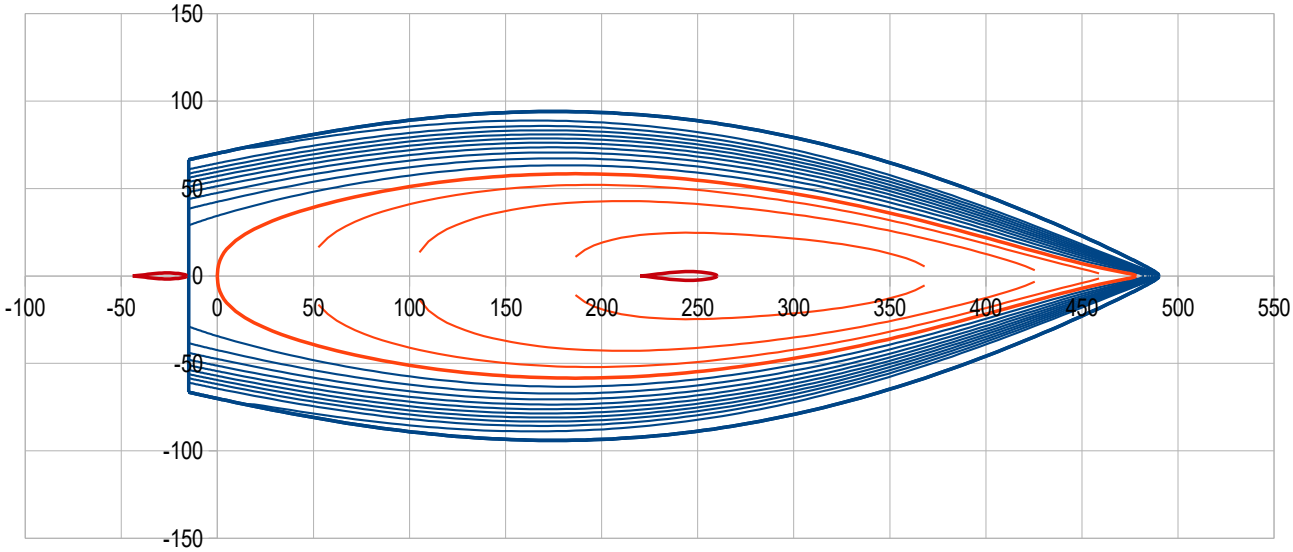


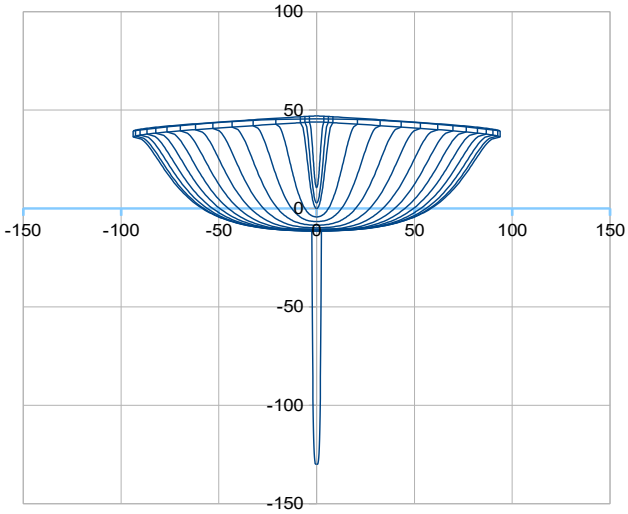
D505, inspired by the 5o5

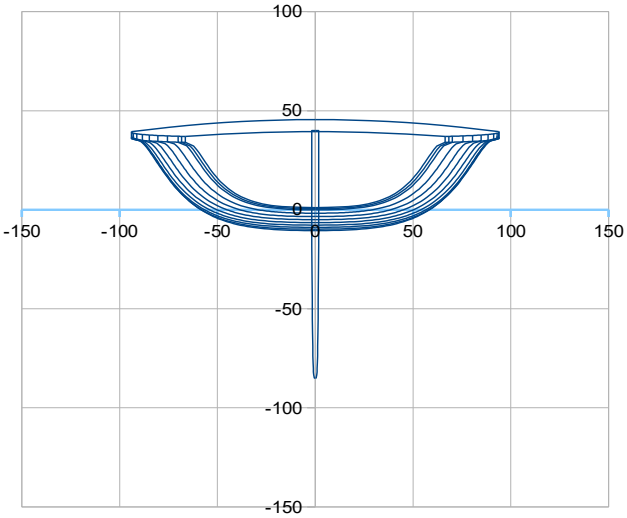
Dinghy D505 short presentation

Loa 5,05 m (16,6') ; Lwl 4,78 m ; B 1,88 m ; Bwl 1,17 m ; Draft 1,30 m ; Displacement of design : 280 kg (Dinghy 130 kg + average load 150 kg) - Sailplan : SA 17,3 m2 , Spi 29,1 m2









Speed prediction of D505, for a crew weight of 150 kg at hiking Y = 1,55 m (one sailor on trapeze) and Z = 0,4 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 150 kg at X = 1,91 m (40% Lwl), Y = 1,55 and Z = 0,4 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*129,99*	*2,096*	*0,496*	*0*	*from the mass spreadsheet*
Load (kg)	**150,00**	**1,91**	**0,65**	**0,00**	Crew at center
			0,40	**1,55**	Crew at windward
Total >>> Mass (kg)	**279,99**	**1,996**	**0,579**	**0,000**	**Crew at center**
Disp. (m3)	**0,27316**		**0,445**	**0,830**	**Crew at windward**

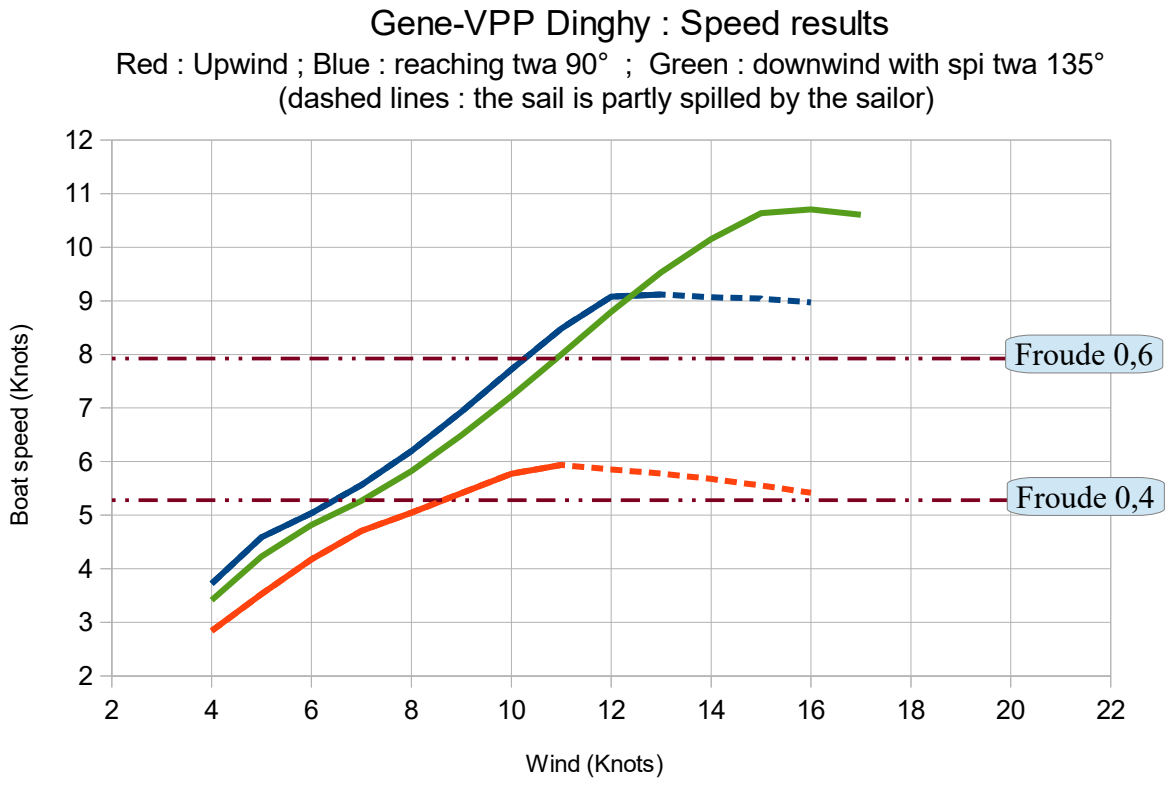
Computation of the RMs and the Sws :

Righting Moment RM (kN.m)			Wetted surface Sw (m2)		
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°
2,280	2,569	2,508	5,31	4,84	4,50

>>> Input data table for Gene-VPP Dinghy :

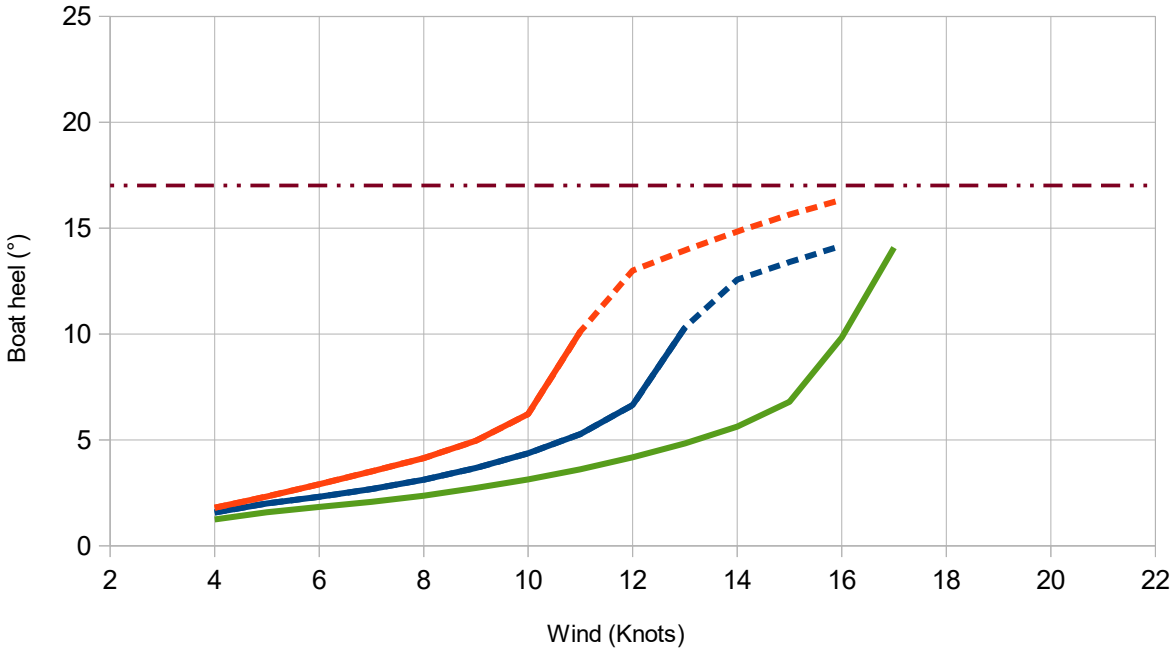
For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
4,71	1,18	0,11	1,88	0,58	46,51	3,97	16,19	3,17	0,43	7,30	12,32	29,08	3,23	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,01028	0,80	0,40					0,00652	0,43	0,28	280	1,30			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
2,280	2,569	2,508	5,31	4,84	4,50									

Gene-VPP output for D505 :

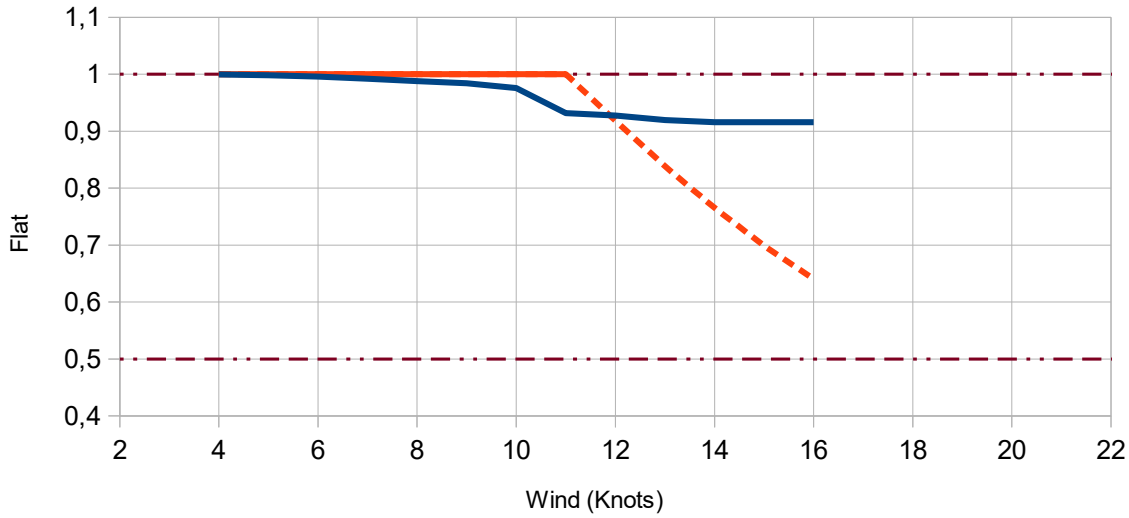


Gene-VPP Dinghy : Heel results

Red : Upwind ; Blue : reaching twa 90° ; Green : downwind with spi twa 135°
(dashed lines : the sail is partly spilled by the sailor)



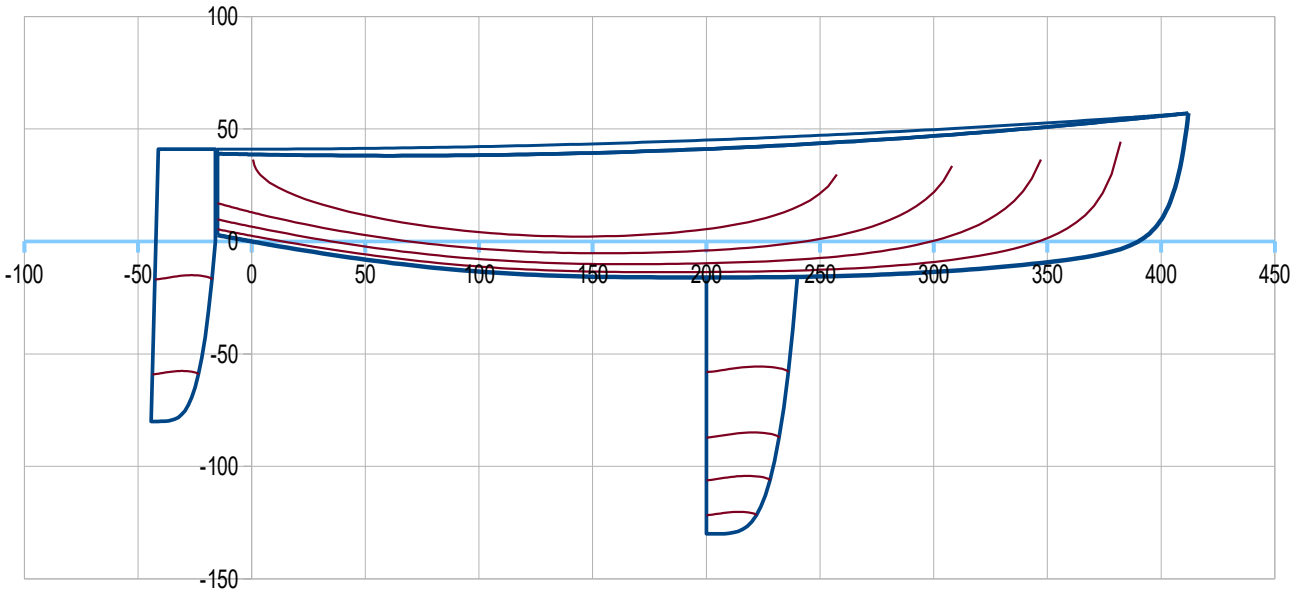
Gene-VPP Dinghy : Spill (Red) and Flat (Blue) optimum when upwind

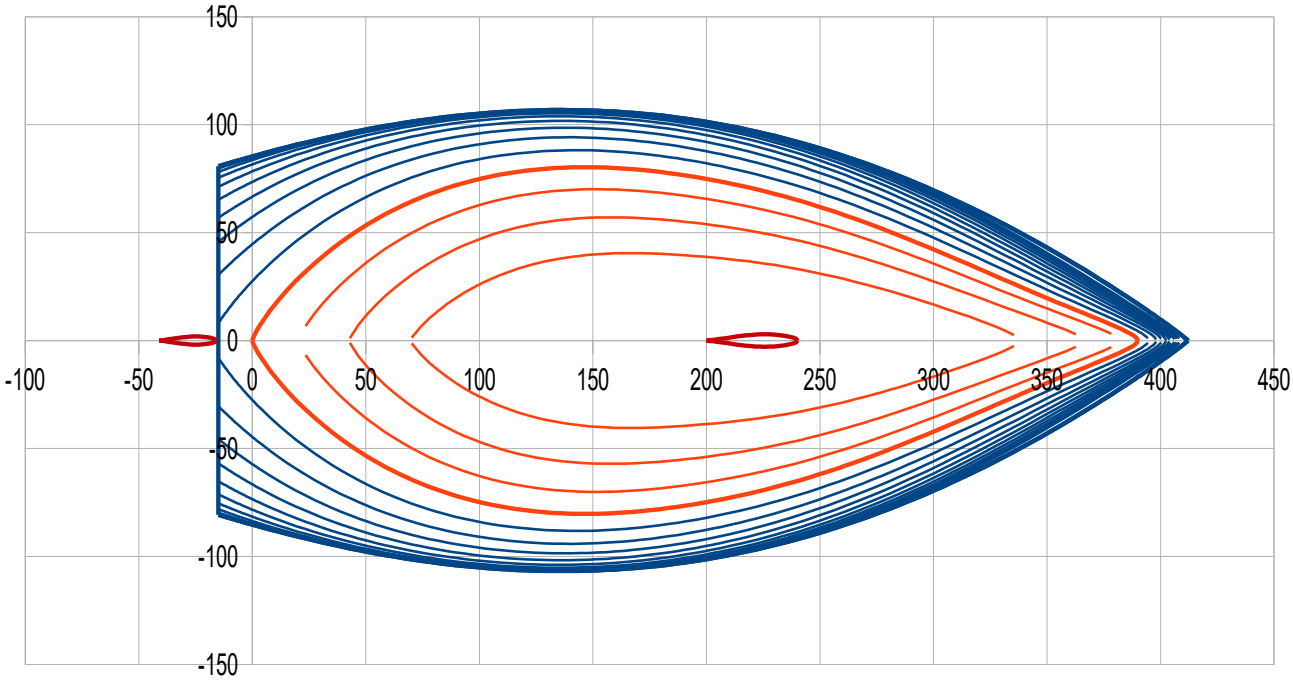


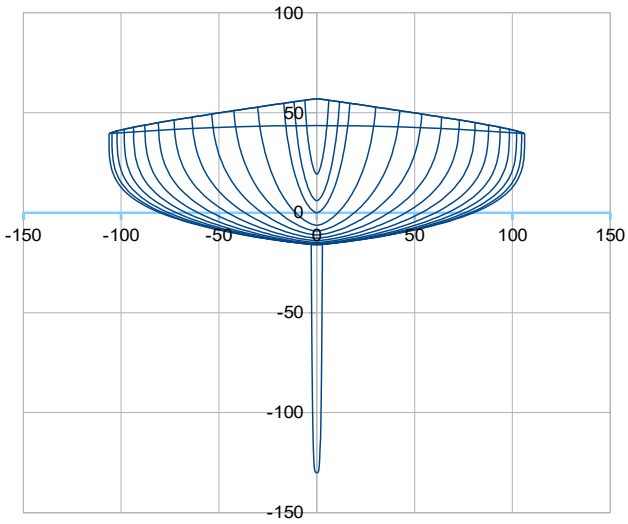
D6, inspired by the APBY 14' Catboat

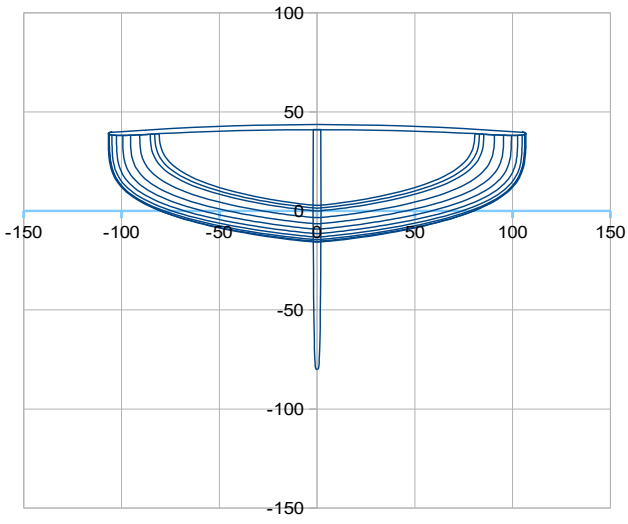
Dinghy D6 short presentation

Loa 4,27 m (14') ; Lwl 3,90 m ; B 2,14 m ; Bwl 1,61 m ; Draft 1,30 m ; Displacement of design : 372 kg (Dinghy 272 kg + average load 100 kg) - Sailplan : Cat-boat sail 13,5 m2 ; no spi









Speed prediction of D6, for a crew weight of 140 kg at an average hiking Y = 0,75 m and Z = 0,4 m

Data preparation with Gene-Hull Dinghy and Stab :

Load 140 kg at X = 1,58 m (40% Lwl), Y = 0,75 and Z = 0,4 m :

Data to enter : yellow cells	Mass (kg)	Xg (m)	Zg (m)	Yg (m)	(in the coordinates of the 2D
Boat light weight (kg)	*271,98*	*1,779*	*0,438*	*0*	*from the mass spreadsheet*
Load (kg)	**140,00**	**1,58**	**0,65**	**0,00**	Crew at center
			0,40	**0,750**	Crew at windward
Total >>> Mass (kg)	**411,98**	**1,711**	**0,510**	**0,000**	**Crew at center**
Disp. (m3)	**0,40193**		**0,425**	**0,255**	**Crew at windward**

Computation of the RMs and the Sws :

Righting Moment RM (kN.m)			Wetted surface Sw (m2)		
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°
1,030	2,038	2,261	5,69	5,17	4,78

>>> Input data table for Gene-VPP Dinghy :

For Gene-VPP, hull body data with loading and at equilibrium upright (put Heel = 0°)							From the Sailplan sheet :							
Lwl (m)	Bwl (m)	Tc (m)	Bmax (m)	Cp hull	LCB hull(%)	Sf (m2)	SA (m2)	ZCE (m)	Zdeck (m)	Zmast (m)	Main (m2)	Spi (m2)	ZCE spi (m)	SA fraction
4,00	1,66	0,17	2,14	0,55	46,90	4,42	13,49	3,30	0,48	7,00	13,49	0,00	3,30	1,00
Daggerboard							Rudder			Displacement and draft at design load				Flat mini
Vol. (m3)	Sw (m2)	Chord (m)					Vol. (m3)	Sw (m2)	Chord (m)	Disp. (kg)	Draft (m)			0,6
0,01155	0,77	0,40					0,00639	0,36	0,25	412	1,31			
Righting Moment RM (kN.m)			Wetted surface Sw (m2)											
RM0°	RM15°	RM25°	Sw0°	Sw15°	Sw25°									
1,030	2,038	2,261	5,69	5,17	4,78									

Gene-VPP output for D6 :