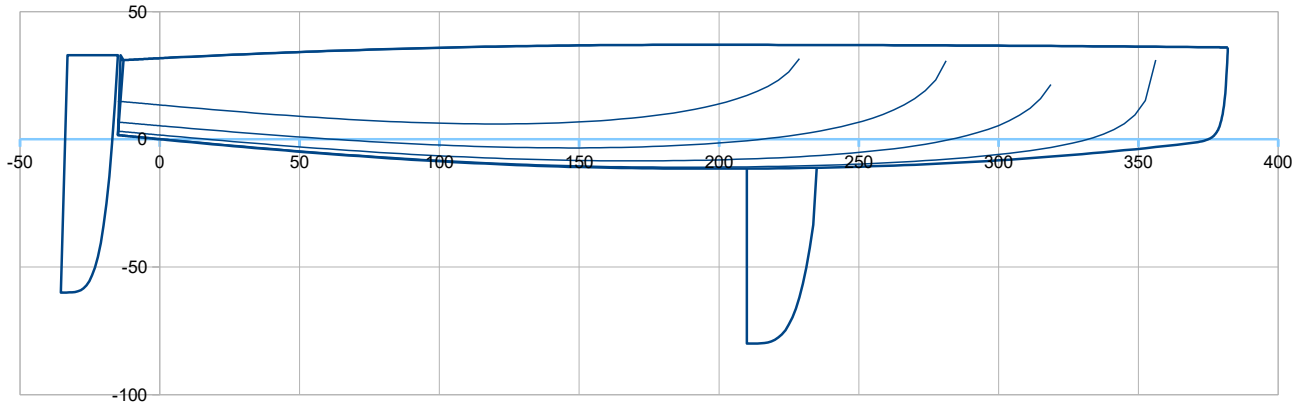
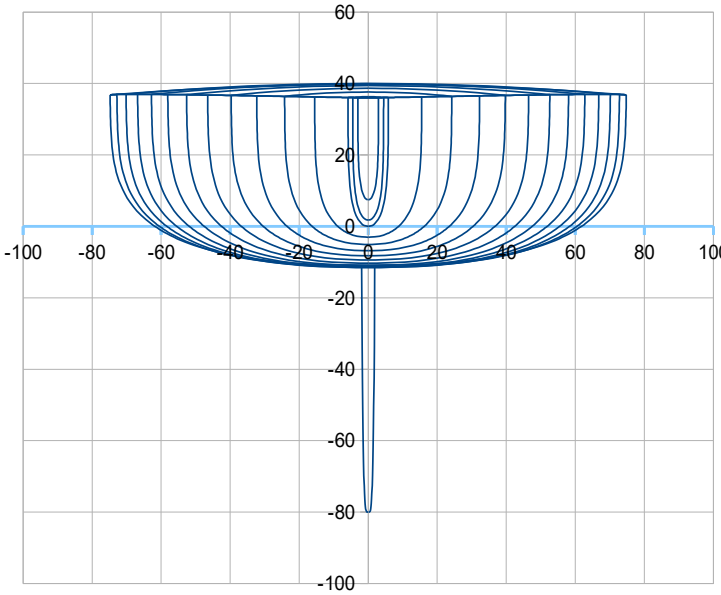
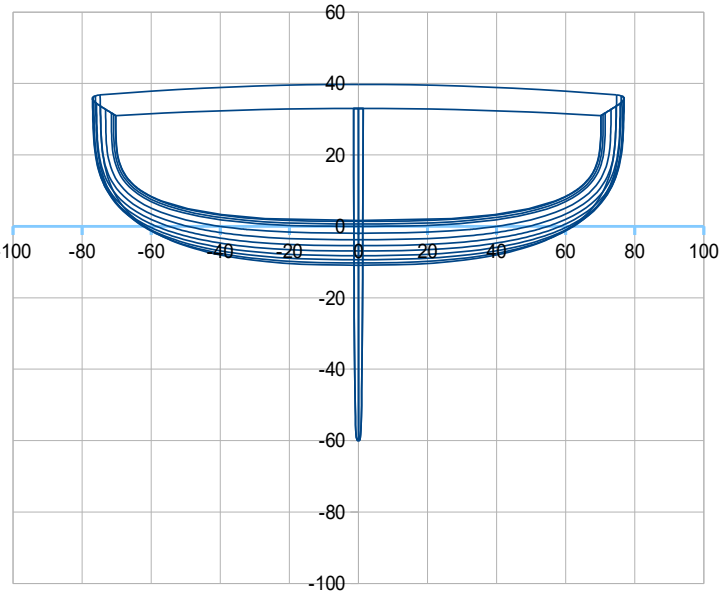
Dinghy 13 Expedition – Alternative

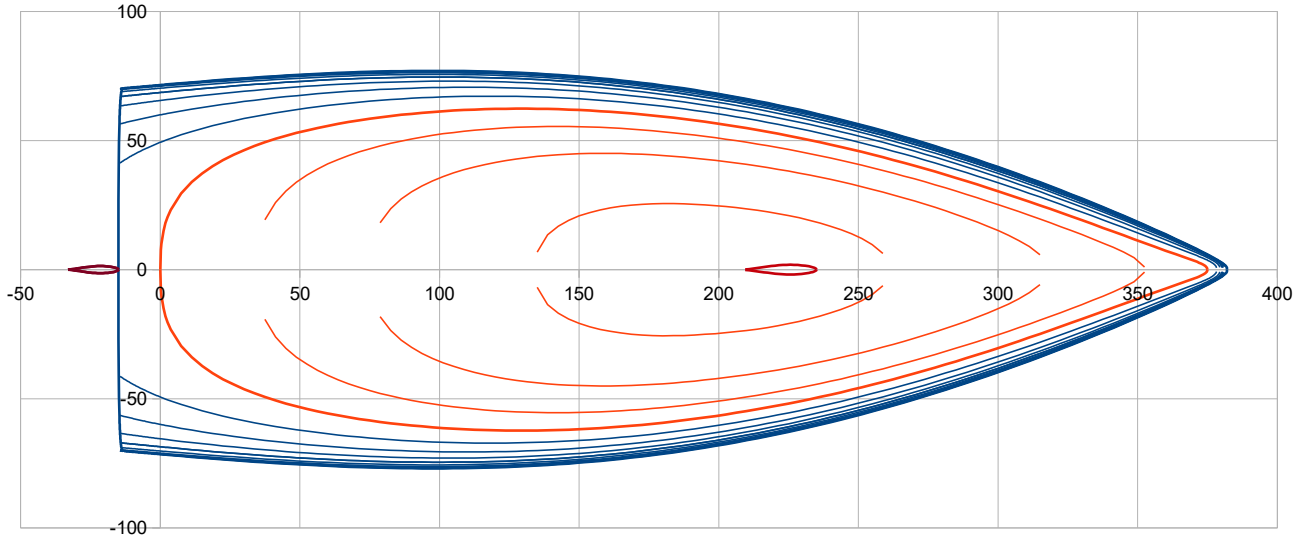
Loa : 3,97 m ; Boa : 1,60 m (Bhull : 1,54 m) ; Bwl (at 227 kg displacement) : 1,25 m

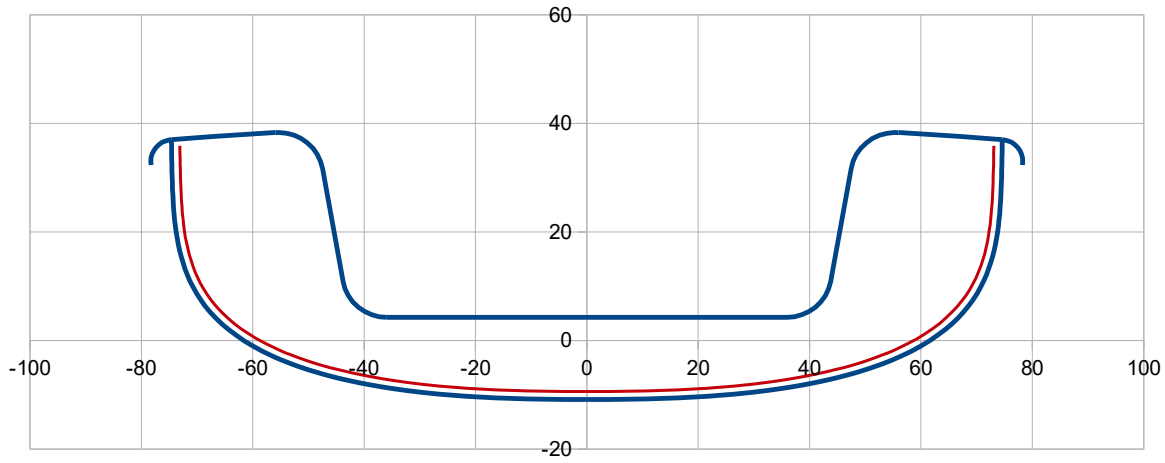
227 kg Disp. : Light weight full equiped ~ 85 kg + (heavy) Helmsman : 95 kg + Camping : 47 kg











Hydrostatics

2.1 Hull

Loa (m)	**3,97**	**Lwl (m)**	**3,75**	>Hull speed	4,7	(at Fn 0,4)			
>> ft	*13,02*		*12,30*						
B (m)	**1,54**	**at X (% Lwl)**	**26,0**						
>> ft	*5,05*								
Bwl (m)	**1,25**	**at X (% Lwl)**	**34,0**	> Bwl / B	0,810				
>> ft	*4,09*			**Freeboards (m) >**		**Aft**	**Midship**	**Fore**	
Tc (m)	**0,115**	**at X (%Lwl)**	**50**			**0,31**	**0,37**	**0,36**	
>> ft	*0,38*				*>> ft*	*1,02*	*1,20*	*1,18*	
Displacement at H0 (m3)		**0,21702**	**at Xc (m)**	**1,748**	**Xc (%Lwl)**	**46,62**	**Zc (m)**	**-0,041**	
	>> lbs	*490*	*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,13*	
Disp at h (cm)	-0,733597703	0,19317	at Xc (m)	1,763	Xc (%Lwl)	47,03	Zc (m)	-0,016	
Disp at h (cm)	0,733597703	0,24204	at Xc (m)	1,732	Xc (%Lwl)	46,19	Zc (m)	-0,066	
Cp (%)	**56,24**								
Sf (m2)	**3,35**	**at Xf (m)**	**1,603**	**Xf (%Lwl)**	**42,75**	>>> Xc – Xf (%Lwl)		3,86	
>> ft2	*36,07*	*>> ft*	*5,26*						
Angle immersed sheer li (°)		**26,2**	at section C4 (40% Lwl)						
Sw (m2)	**3,40**	>Sw/D^(2/3)	9,43						
>> ft2	*36,64*								
Shull (m2)	**6,89**	**at X (m)**	**1,638**	**Z (m)**	**0,043**				
>> ft2	*74,16*	*>> ft*	*5,37*	*>> ft*	*0,14*				
Sdeck (m2)	**4,64**	**at X (m)**	**1,482**						
>> ft2	*49,92*	*>> ft*	*4,86*						

2.2 Daggerboard

Volume (m3)	**0,00312**	**at X (m)**	**2,222**	**X (%Lwl)**	**59,27**	**Z (m)**	**-0,39**	
Draft oa (m)	**0,80**		**Sw (m2)**	**0,31**		**Sxz (m2)**	**0,15**	
>> ft	*2,62*		*>> ft2*	*3,37*		*>> ft2*	*1,62*	
CLR (m)	**2,285**	**CLR (%Lwl)**	**60,92**	method : keel profile extended to the waterline, 25% c at 45% draft oa				
>> ft	*7,50*							

2.3 Rudder(s)

Number	**1**							
Volume (m3)	**0,00143**	**at X (m)**	**-0,246**	**X (%Lwl)**	**-6,57**	**Z (m)**	**-0,054**	
Sw (m2)	**0,18**	*>> ft*	*-0,81*			**Sxz (m2)**	**0,09**	per rudder
>> ft2	*1,92*					*>> ft2*	*0,92*	

2.4 Hull + Daggerboard + Rudder(s)

Displacement at H0 (m3)		**0,22157**	**at Xc (m)**	**1,742**	**Xc (%Lwl)**	**46,45**	**Zc (m)**	**-0,046**
	Disp. (kg)	**227,1**	*>> ft*	*0,53*			*>> ft*	*-0,15*
	>> lbs	*501*						
	Sw (m2)	**3,90**	>Sw/D^(2/3)	10,64	Lwl/D^(1/3)	6,20		
	>> ft2	*41,93*			*DLR*	*120*	*M(lbs/2240)/(Lwl(ft)/100)^3*	

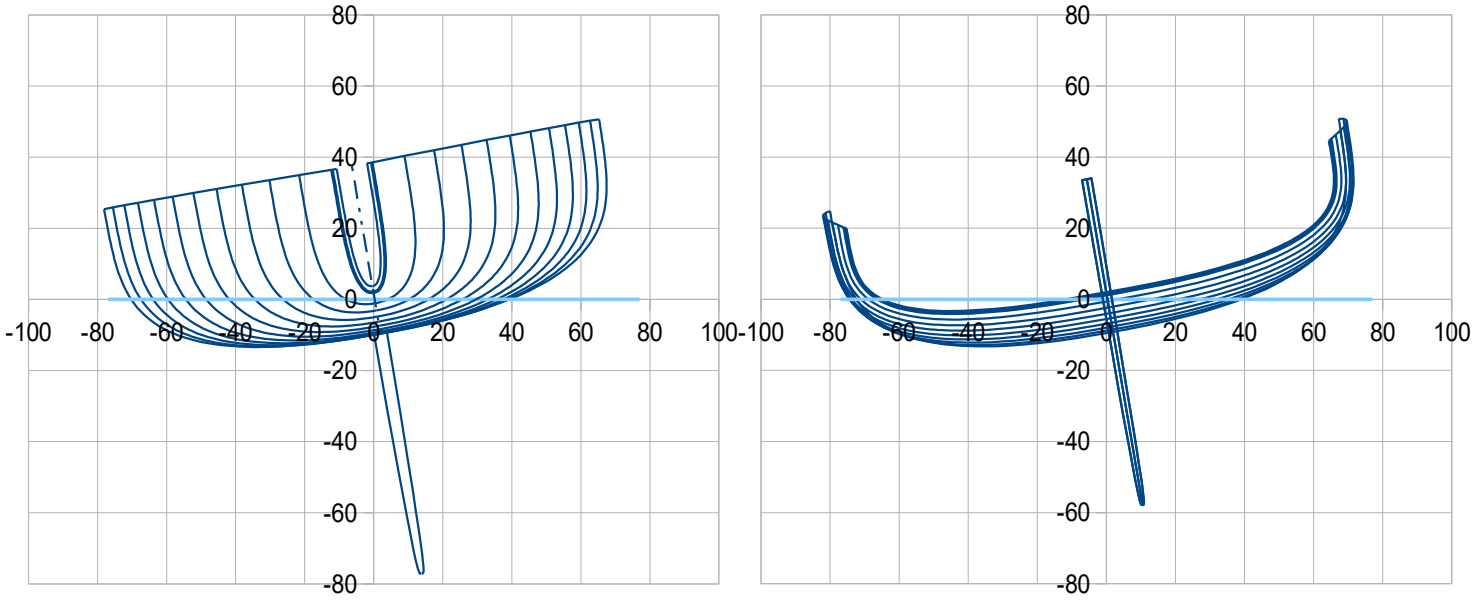
2.5 Data from the mass spreadsheet

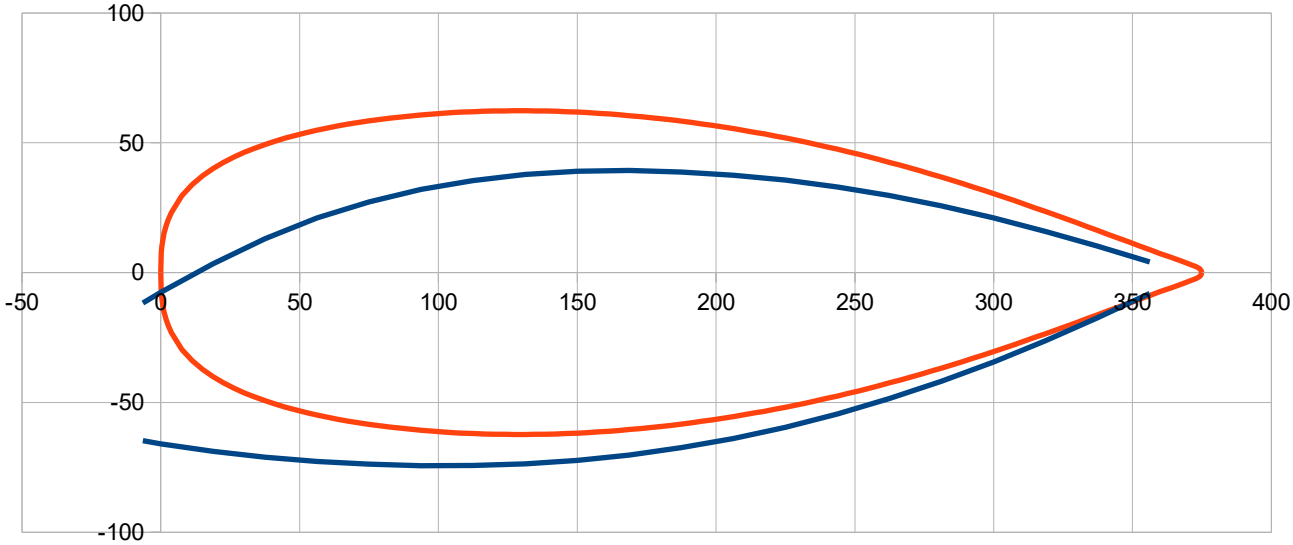
Boat chargé:	**M (kg)**	**227,1**	**at Xg (m)**	**1,619**	**Xc (%Lwl)**	**43,18**	**at Zg (m)**	**0,334**
Light boat :		85,3		1,680				0,422

At 10° Heel angle (at 227 kg displacement, inc. helmsman 95 kg in hiking position and 47 kg of camping)

Data to enter		Results for iteration on height and trim		Data to compare with :		Other results for RM , obliquity and freeboard	
Heel (°)	10			Mass (kg)	227,07		
Height (cm)	1,6455	Disp. (m3)	0,22153	/ Disp. (m3)	0,22153	Hull Mom(m4)	0,047
Trim (°)	0,100	Xc heel (m)	1,619	/ Xg (m)	1,619	Mom (kN.m)	0,47
		Other results		Xc Heel 0°	1,742	Yg heel (m)	0,32
		Yc heel (m)	-0,210	Yc Heel 0°	0,000	>> GZ (m)	0,527
		Zc heel (m)	-0,050	Zc Heel 0°	-0,046	RM (kN.m)	1,174
		Sw heel (m2)	3,66	Sw Heel 0°	3,90	Obliquity (°)	4,84
						Freeboard minimum (m)	0,20

The RM with helmsman at center is itself 0,339 kN.m, so 29% of the total RM 1,174 kN.m when the helsman is hiking.





Sailplan (with 9m2 mainsail option) :