



Navalapp



Considerations

Paper: “An Approximation Method for the Added Resistance in Waves of a Sailing Yacht,” MDY06 Madrid March 2006 by J.A.Keuning, K.J.Vermeulen, H.P. ten Have.

At <http://dsyhs.tudelft.nl/>, library, file: [2006 - MDY - Added Resistance in Waves - CoefficientsRAW](#), has been found that:

- Coefficients for **$k_{yy} = 0.25L$, $F_n = 0.25$, $a = 120$** are the same than coefficients for **$k_{yy} = 0.25L$, $F_n = 0.25$, $a = 180$**
- Coefficients for **$k_{yy} = 0.25L$, $F_n = 0.30$, $a = 100$** are the same than coefficients for **$k_{yy} = 0.25L$, $F_n = 0.35$, $a = 100$**

We have calculated the Added Resistance in Waves using the yacht coefficients parameters shown in page 4 and we have found:

- **$k_{yy} = 0.25L$, $F_n = 0.25$, $a = 180$** seems to be correct, and **$k_{yy} = 0.25L$, $F_n = 0.25$, $a = 120$** are definitely wrong
- **$k_{yy} = 0.25L$, $F_n = 0.30$, $a = 100$** seems to be correct, and **$k_{yy} = 0.25L$, $F_n = 0.35$, $a = 100$** are definitely wrong



Yacht Parameters



Hull

L_{WL} ?

11.9 [m]

T_C ?

0.4 [m]

B_{WL} ?

3.18 [m]

∇_C ?

6.05 [m³]

C_P ?

0.56 [--]

Symbol	Parameter	Valid Range	Value
C_P	Prismatic coefficient	0.519 - 0.599	0.560
B_{WL} / L_{WL}	Beam / Length ratio	0.170 - 0.366	0.267
$\nabla_C^{1/3} / L_{WL}$	Displacement / Length ratio	0.12 - 0.23	0.153
C_M	Midship section coefficient ($C_M = A_{Mc} / B_{WL} \cdot T_C \approx \nabla_C / L_{WL} \cdot B_{WL} \cdot T_C \cdot C_P$)	0.646 - 0.790	0.714
B_{WL} / T_C	Beam / Draft ratio	2.46 - 19.38	7.950

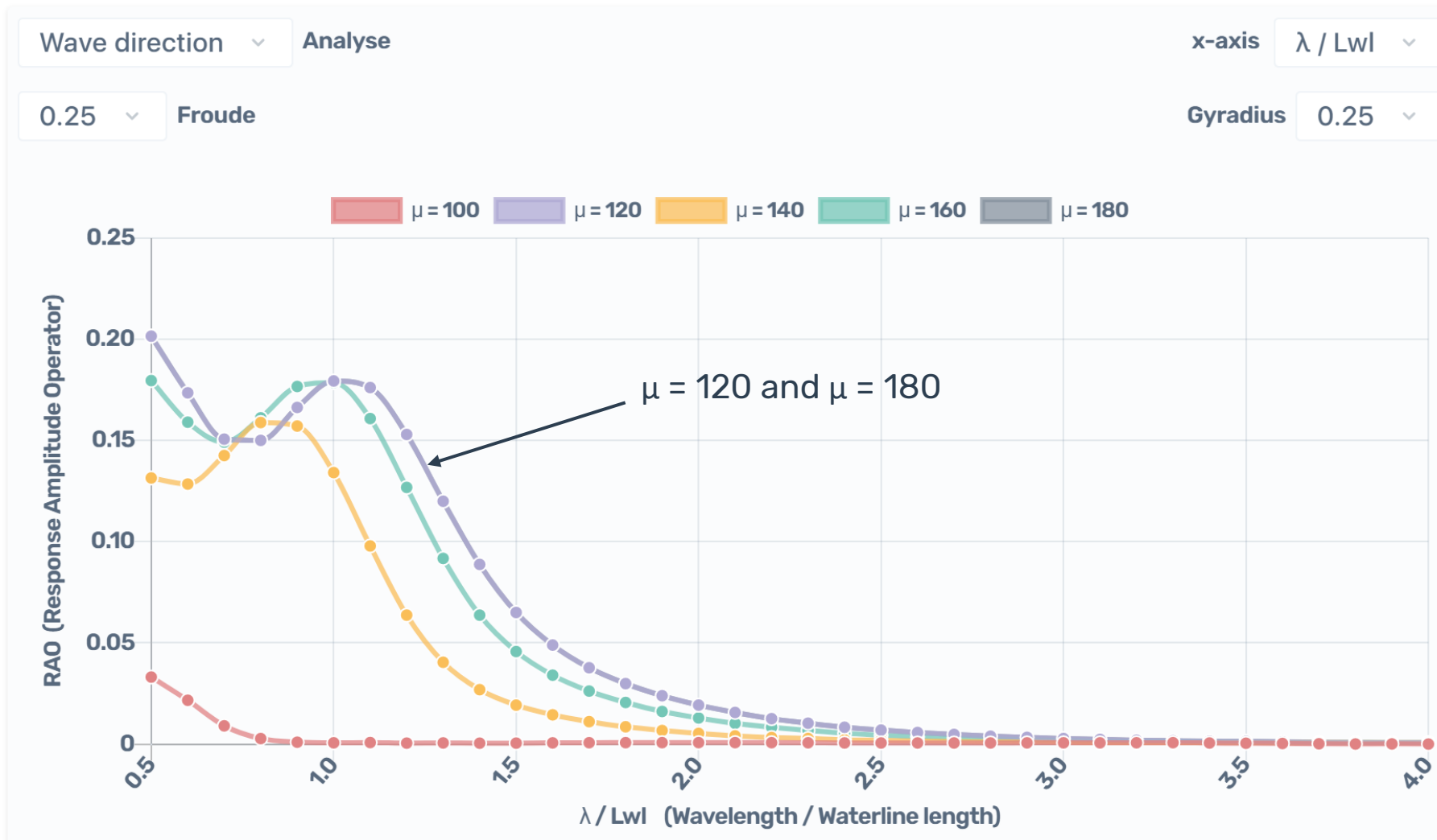
Reset

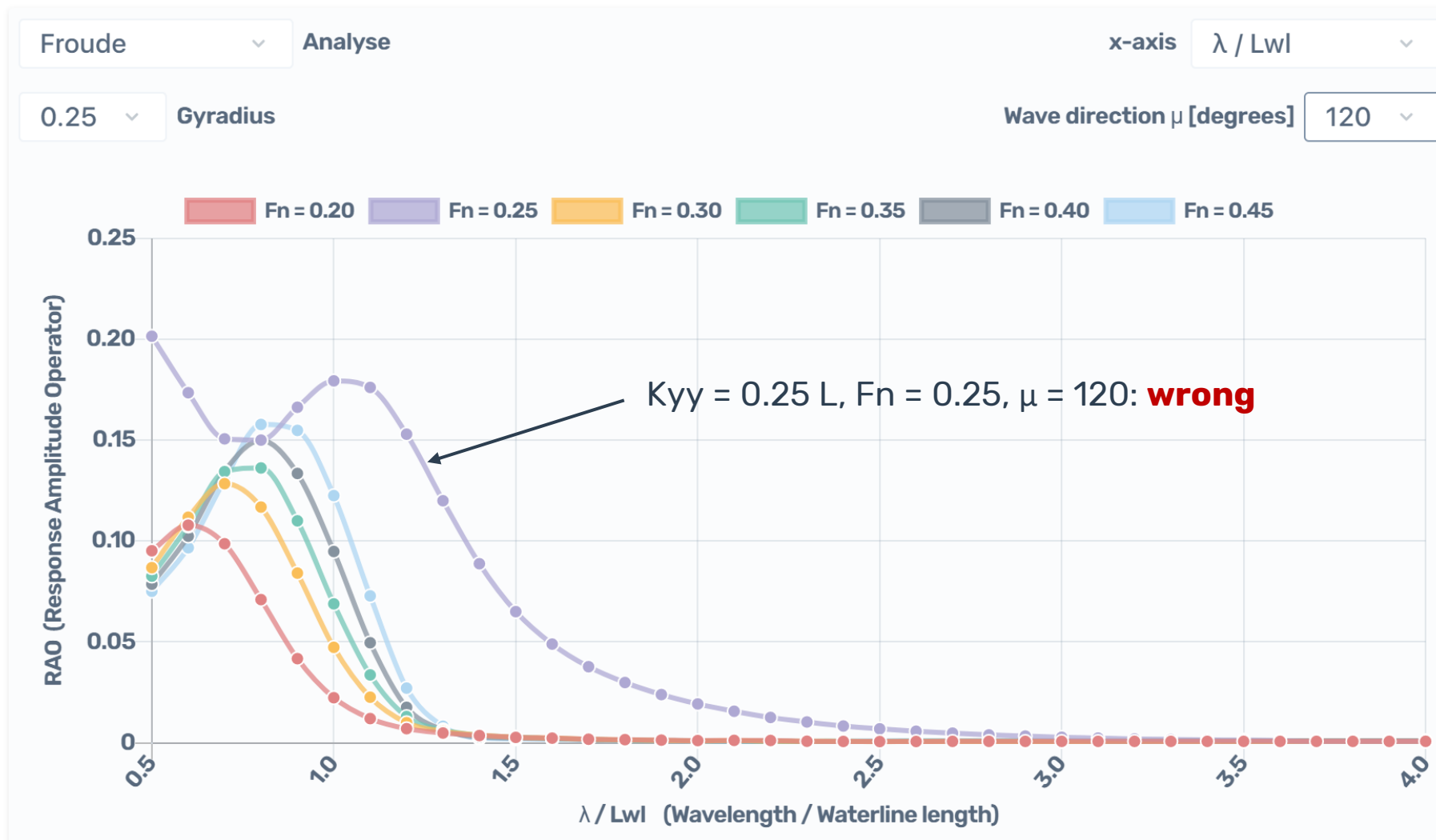
Example

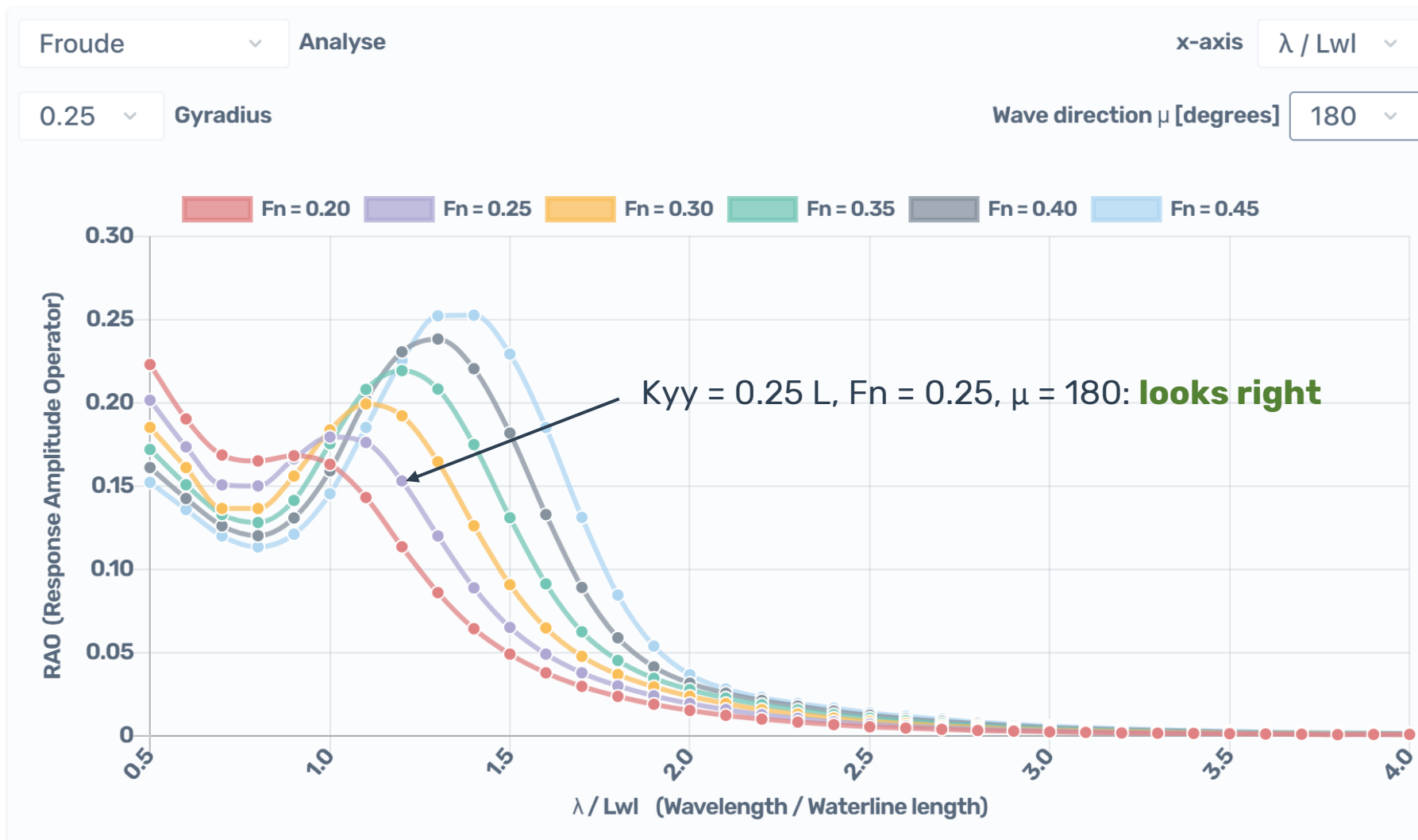
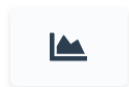
Calculate



$k_{yy} = 0.25L,$
 $F_n = 0.25, a = 120$

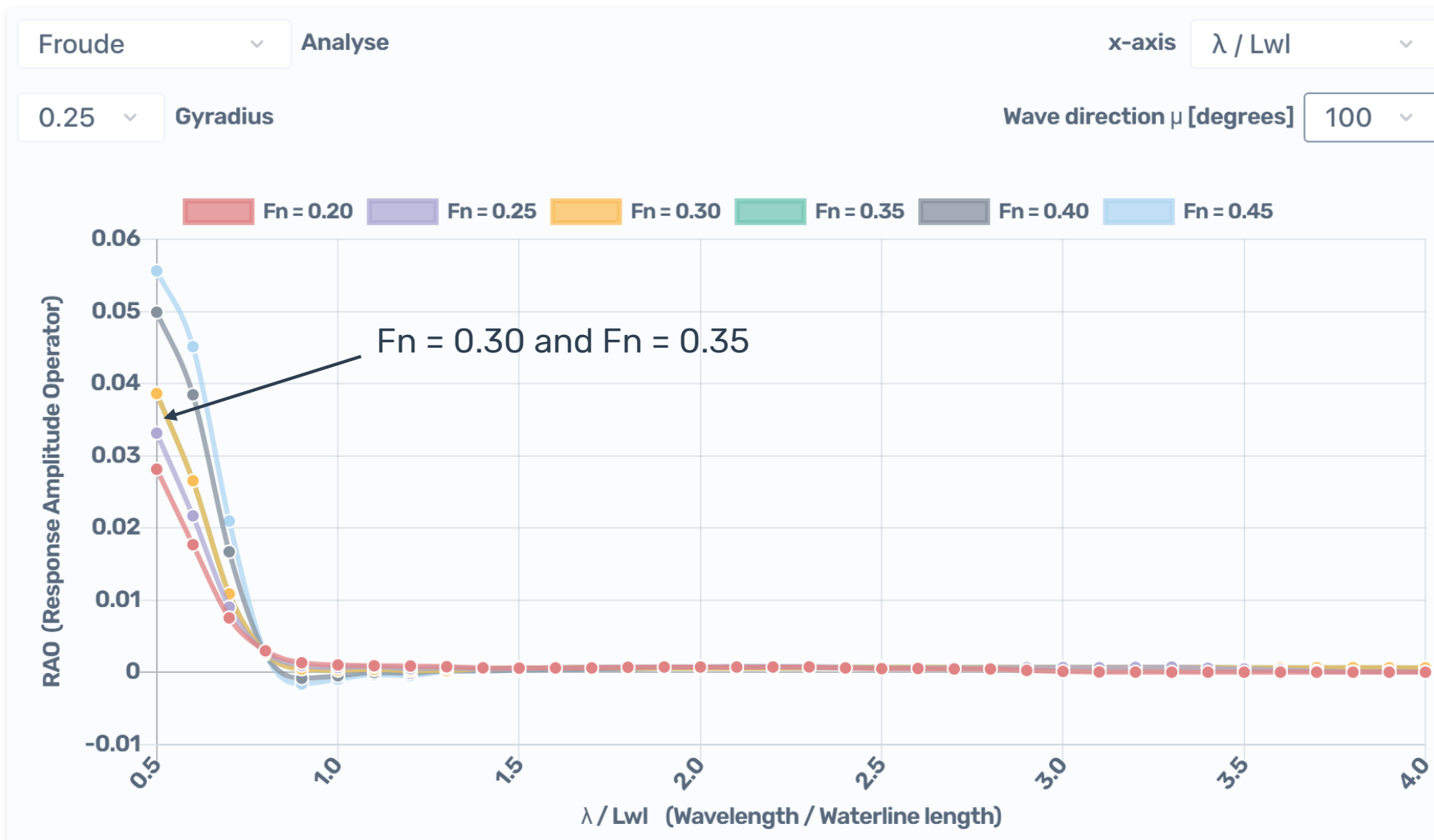
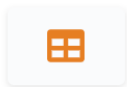


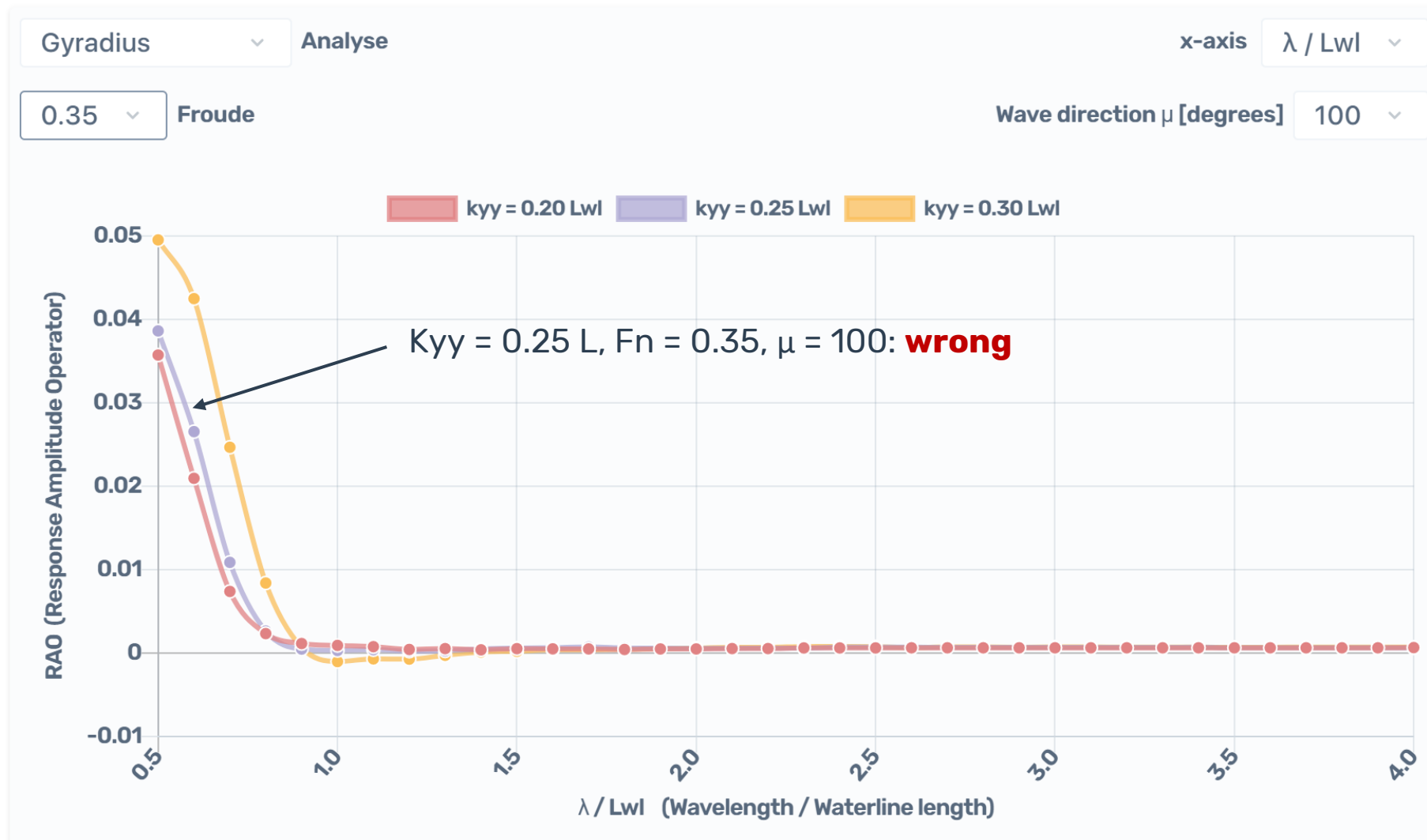
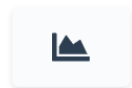


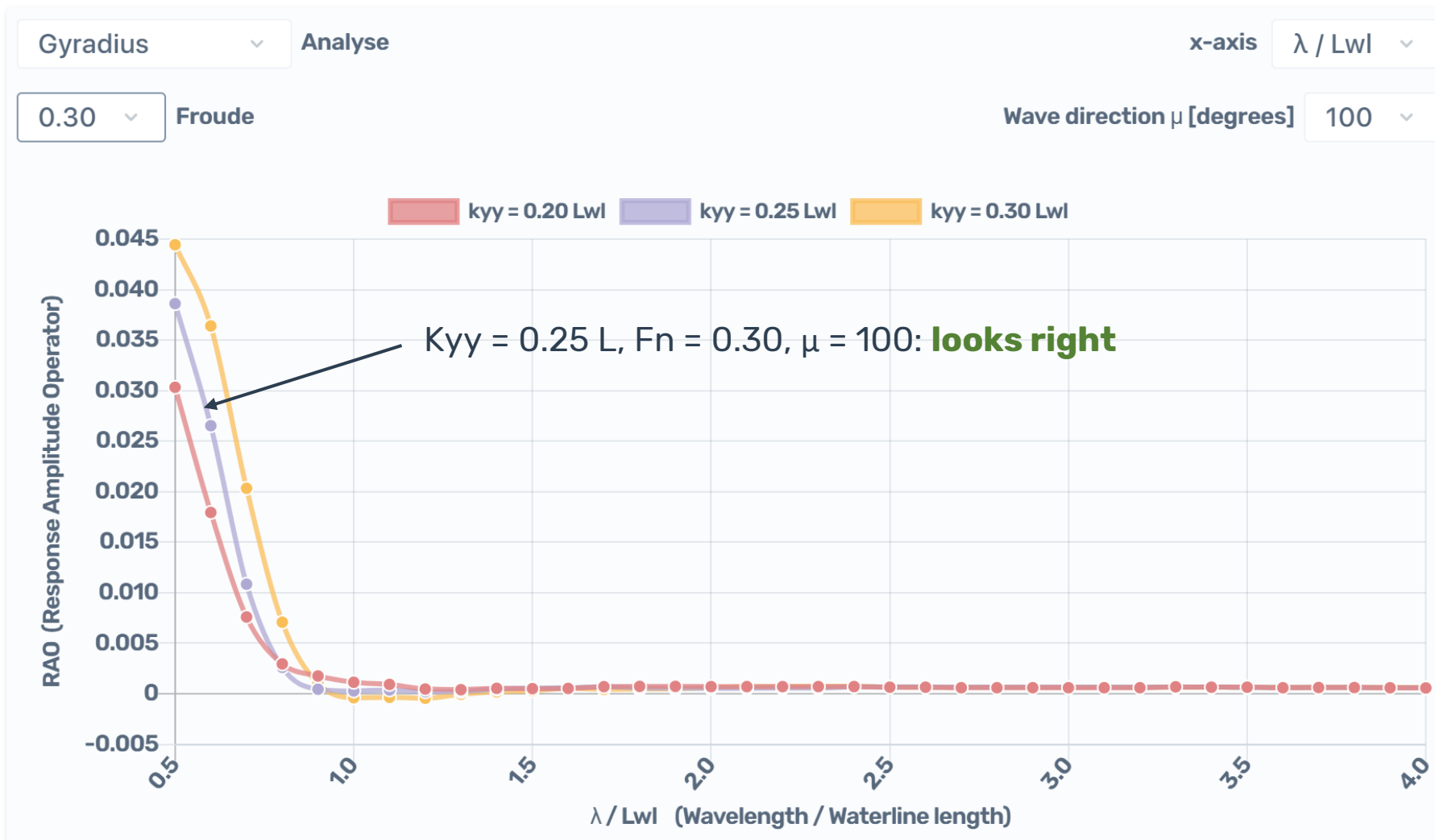
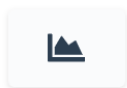




$k_{yy} = 0.25L,$
 $F_n = 0.35, a = 100$







Calculation

<https://navalapp.com/articles/added-resistance-in-waves-response-amplitude-operator-calculation/>