



Mt501 Hydromechanica 1

College 10

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23-3-2010

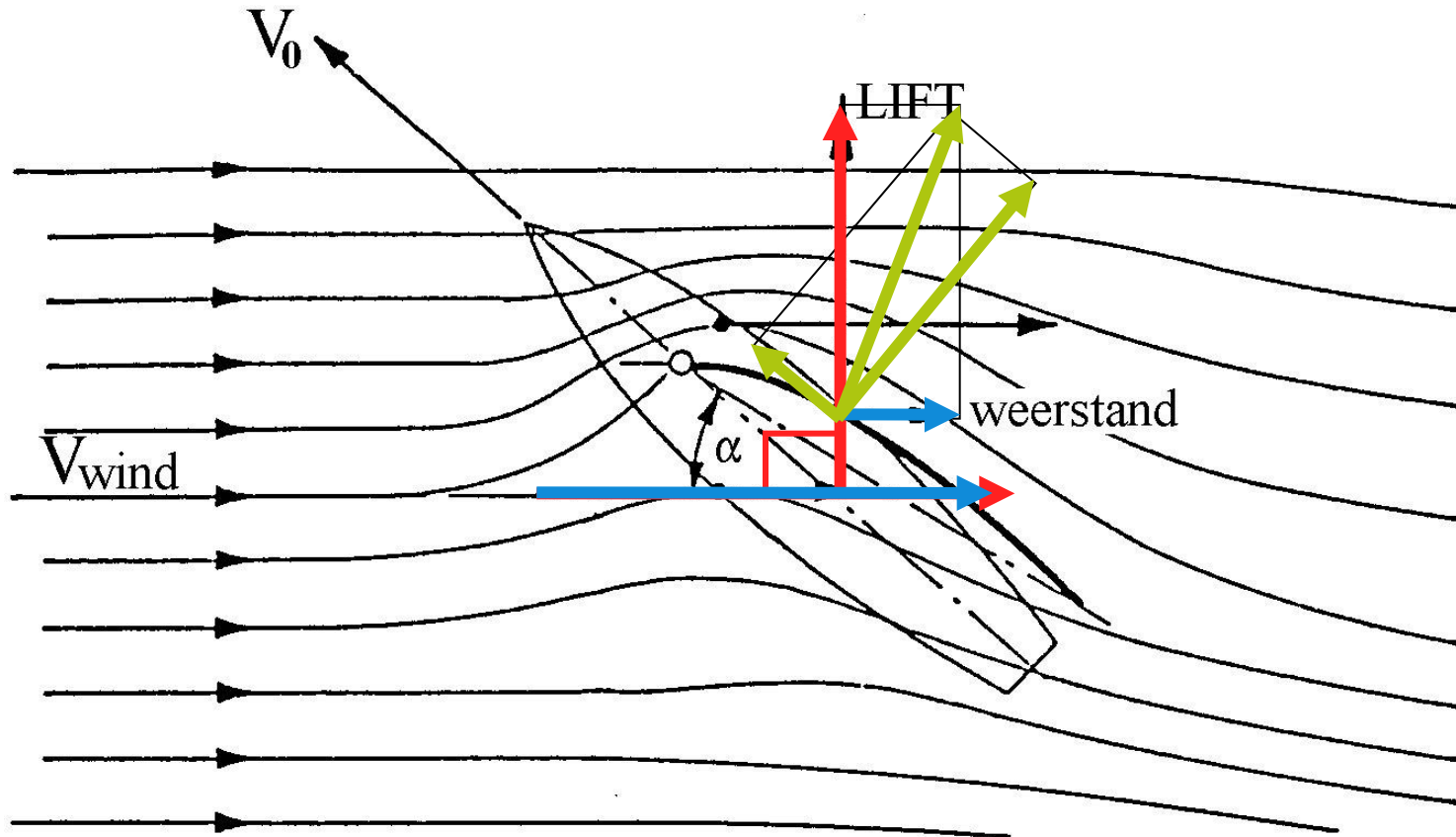
Hoofdstuk 8 Voortstuwing

Mt501 Hydromechanica 1

Zeilen

Zeilen

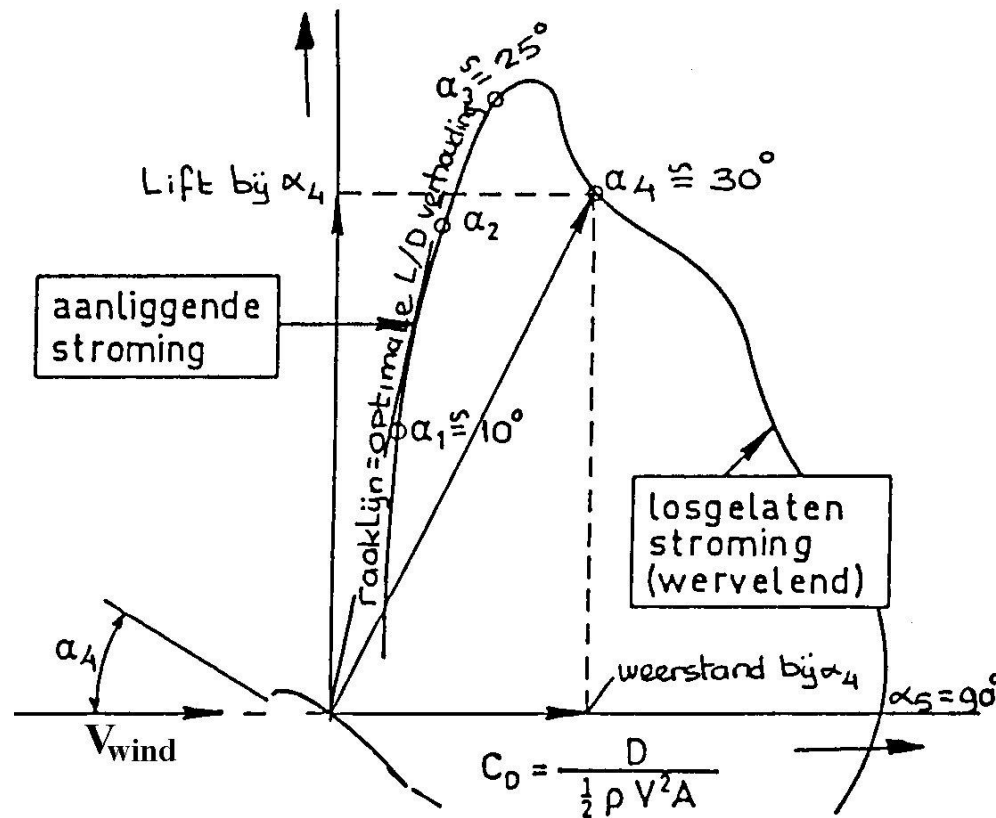
Omstroming



Zeilen

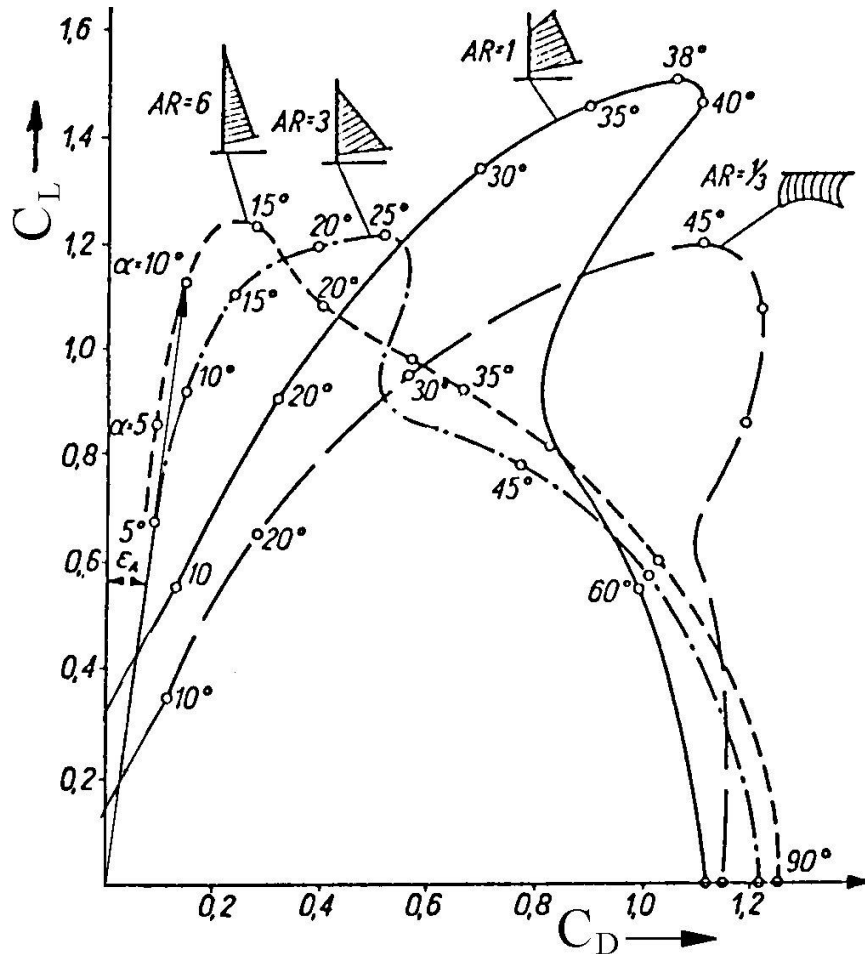
Polaire curve

$$C_L = \frac{L}{\frac{1}{2} \rho V^2 A}$$



Zeilen

Invloed planvorm en aspect ratio



$\alpha = \text{invalshoek}$

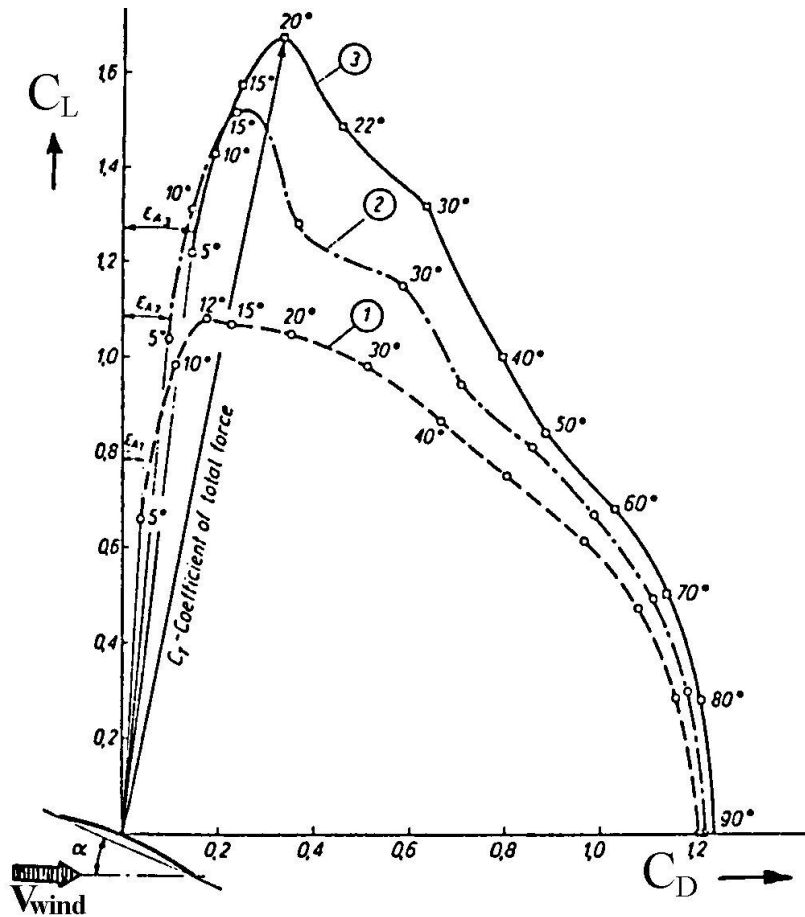
$$C_L = \frac{L}{\frac{1}{2}\rho V^2 A}$$

$$C_D = \frac{D}{\frac{1}{2}\rho V^2 A}$$

$AR = \text{aspectverhouding}$

Zeilen

Invloed bolling



Profieldoorsneden

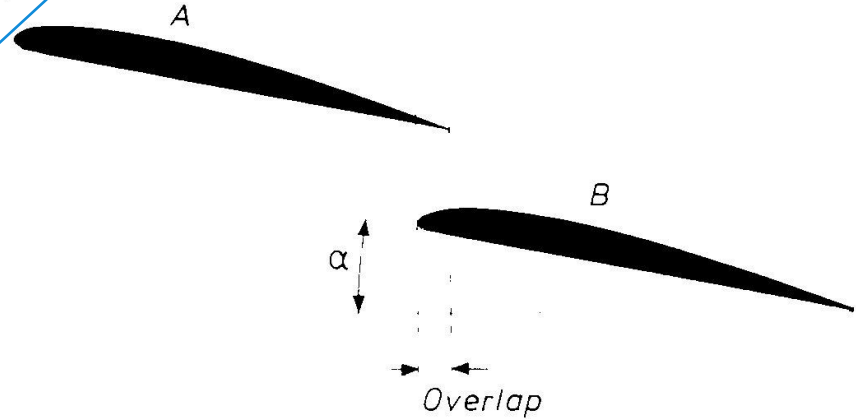
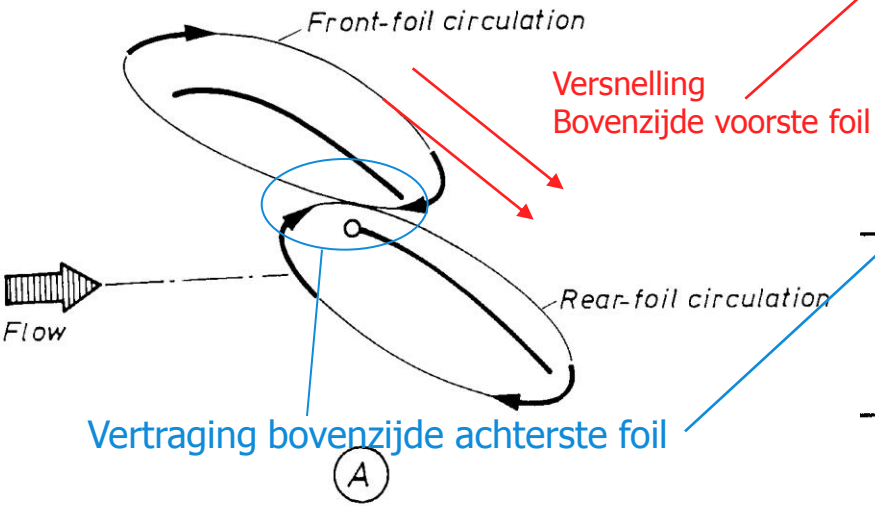
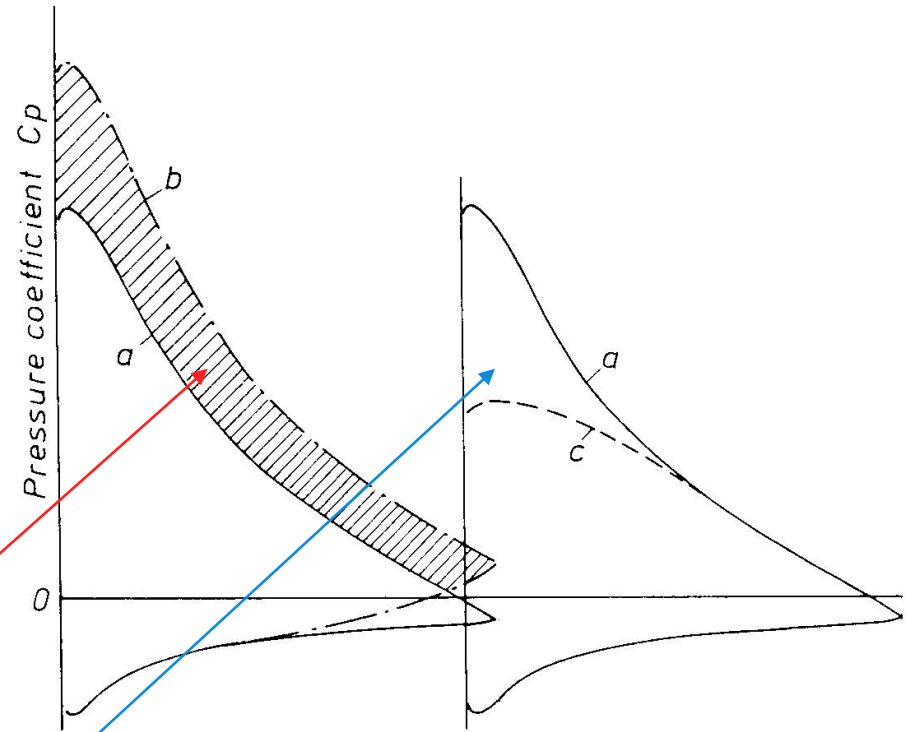
1 = bolling 5 %

2 = bolling 10 %

3 = bolling 15 %

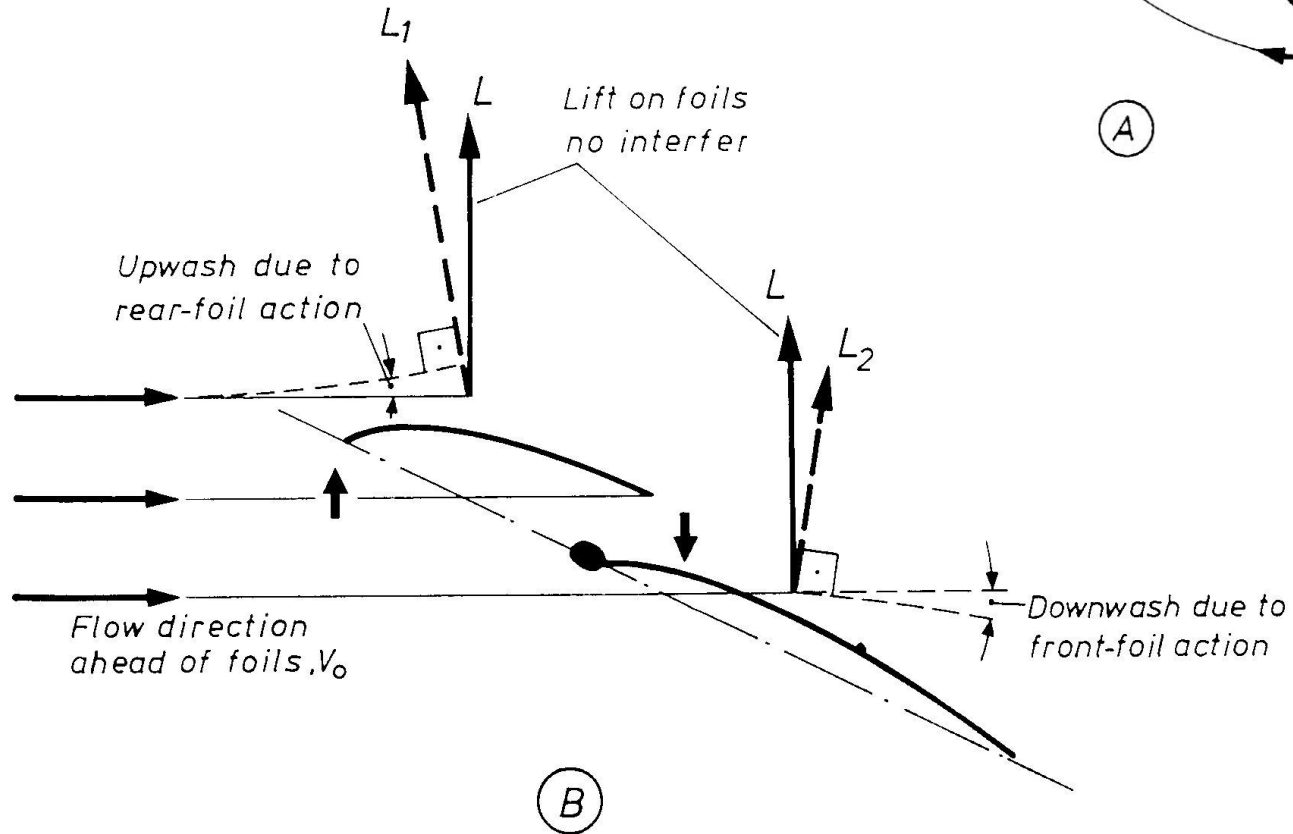
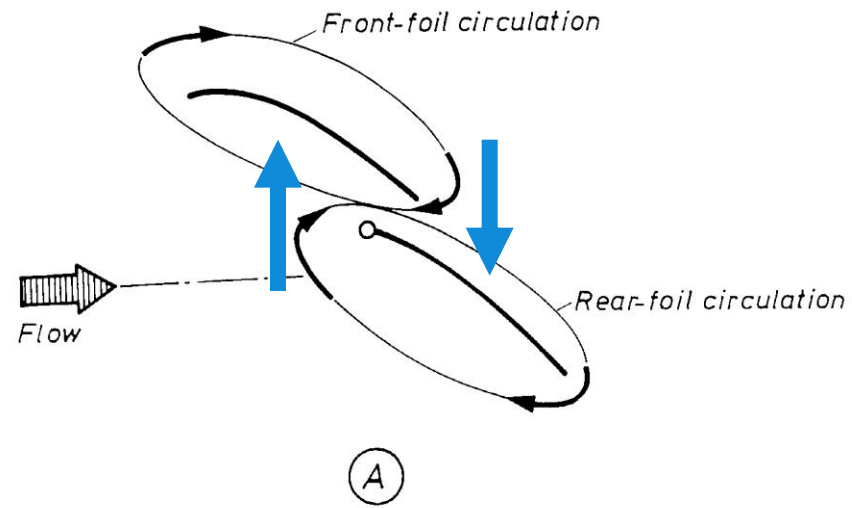
Zeilen

Interactie effecten



Zeilen

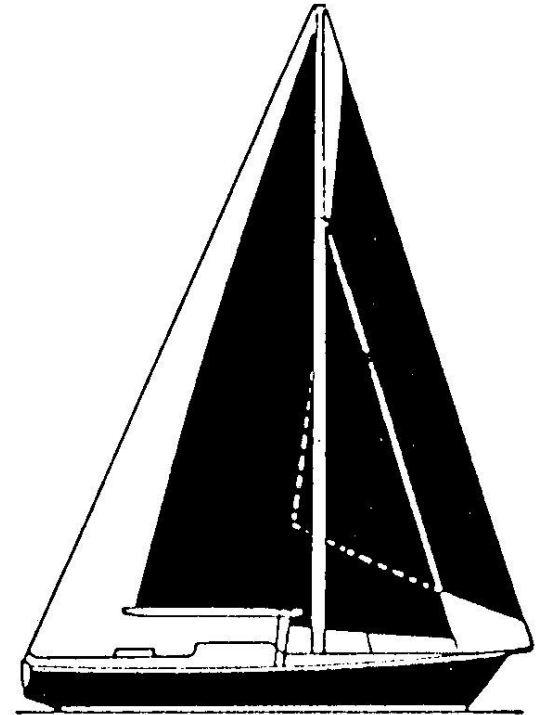
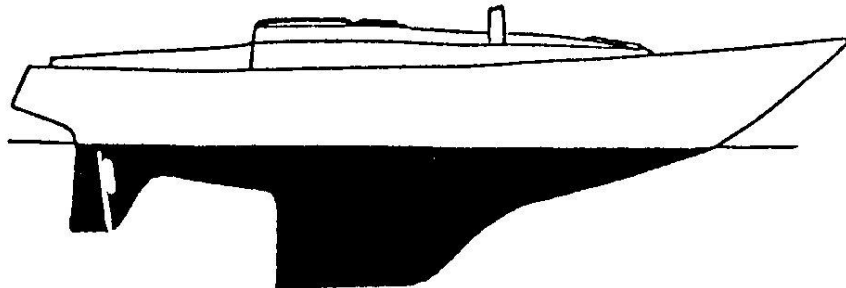
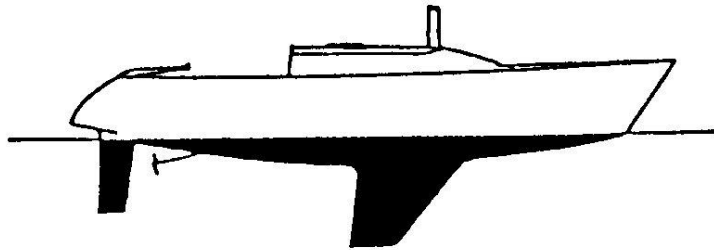
Interactie effecten



Wanneer werkt een kiel?

Zeilen

Onderwater-bovenwater

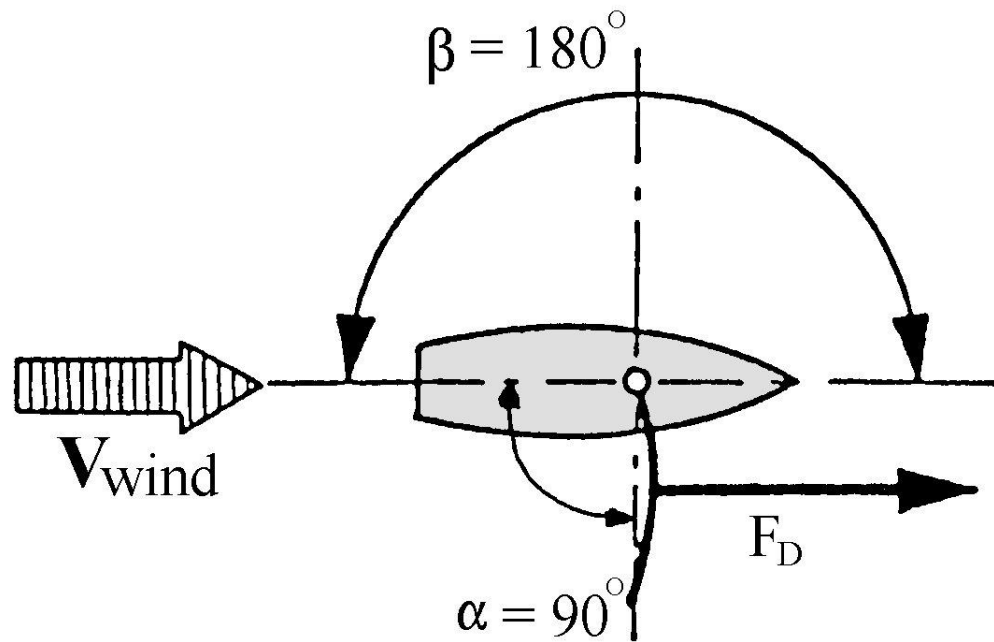


Zeilen

Onderwater-bovenwater

Zeilen

Range van invalshoeken



β = invalshoek windt.o.v.
langs-as schip.

α = invalshoek windt.o.v.
het zeil.

Zeilen

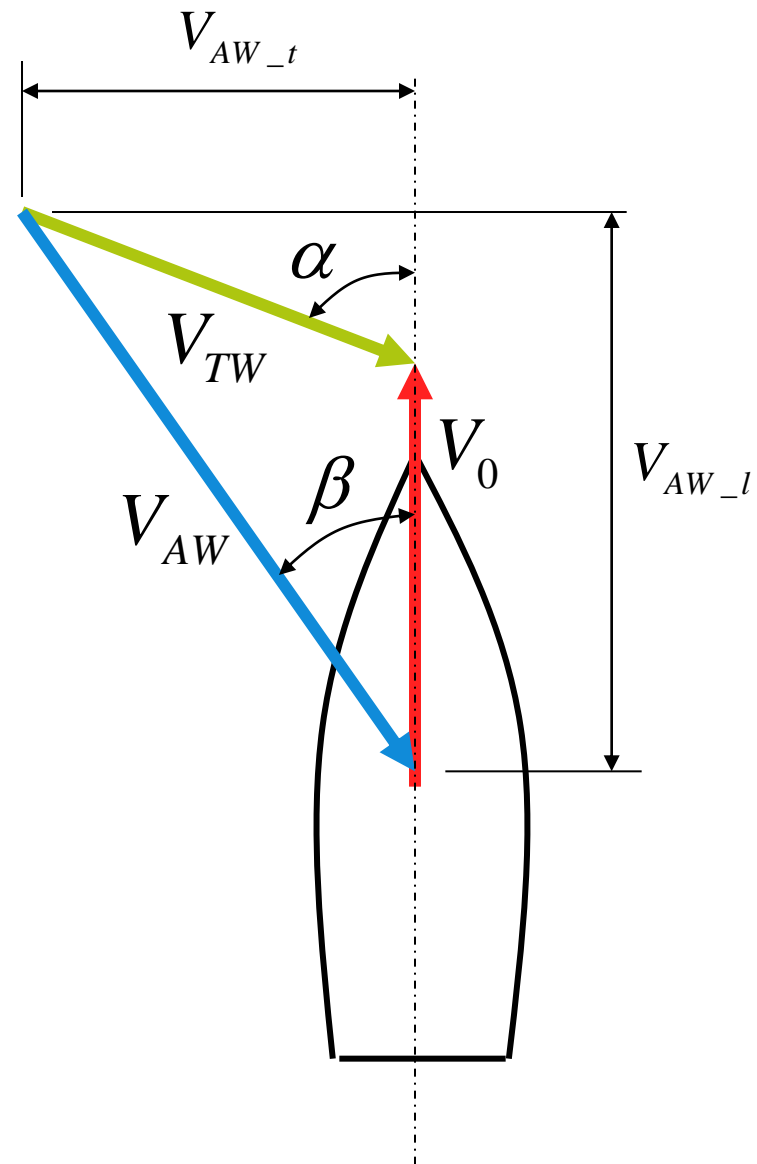
Schijnbare wind

$$V_{AW_t} = V_{TW} \sin \alpha$$

$$V_{AW_l} = V_{TW} \cos \alpha + V_0$$

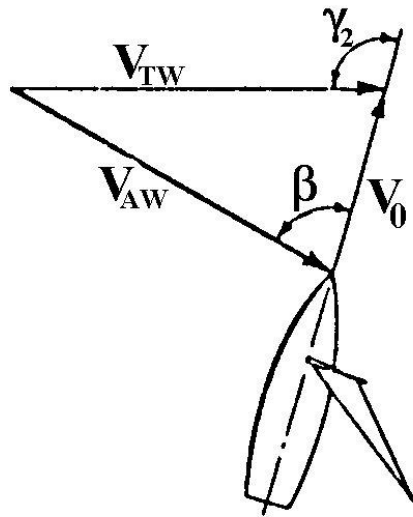
$$V_{AW} = \sqrt{V_{AW_t}^2 + V_{AW_l}^2}$$

$$\beta = \arctan \left(\frac{V_{AW_t}}{V_{AW_l}} \right)$$



Zeilen

Schijnbare wind



schijnbare wind:

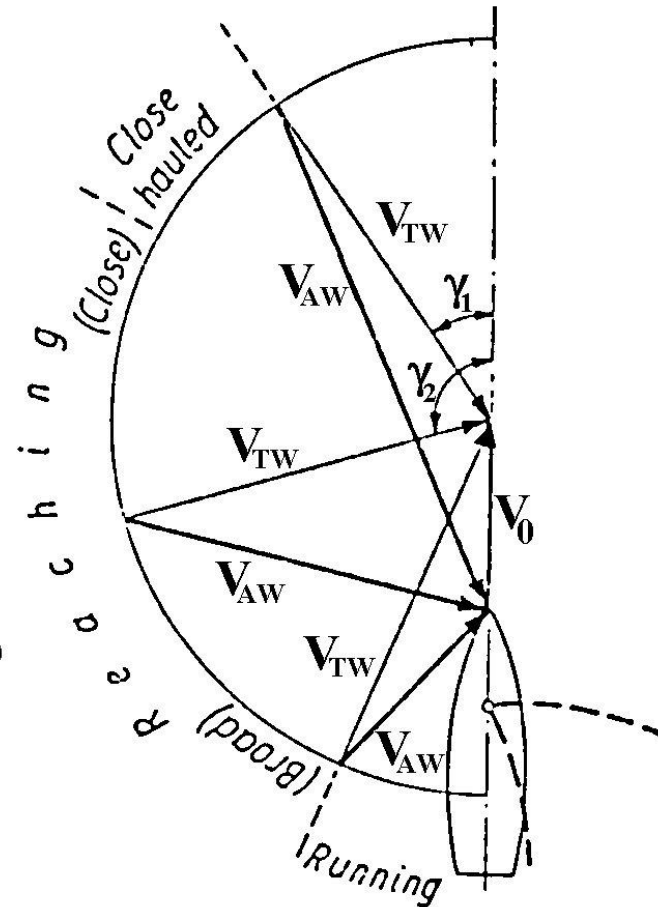
V_0 = voorwaardse snelheid schip

V_{TW} = ware windsnelheid

V_{AW} = schijnbare windsnelheid

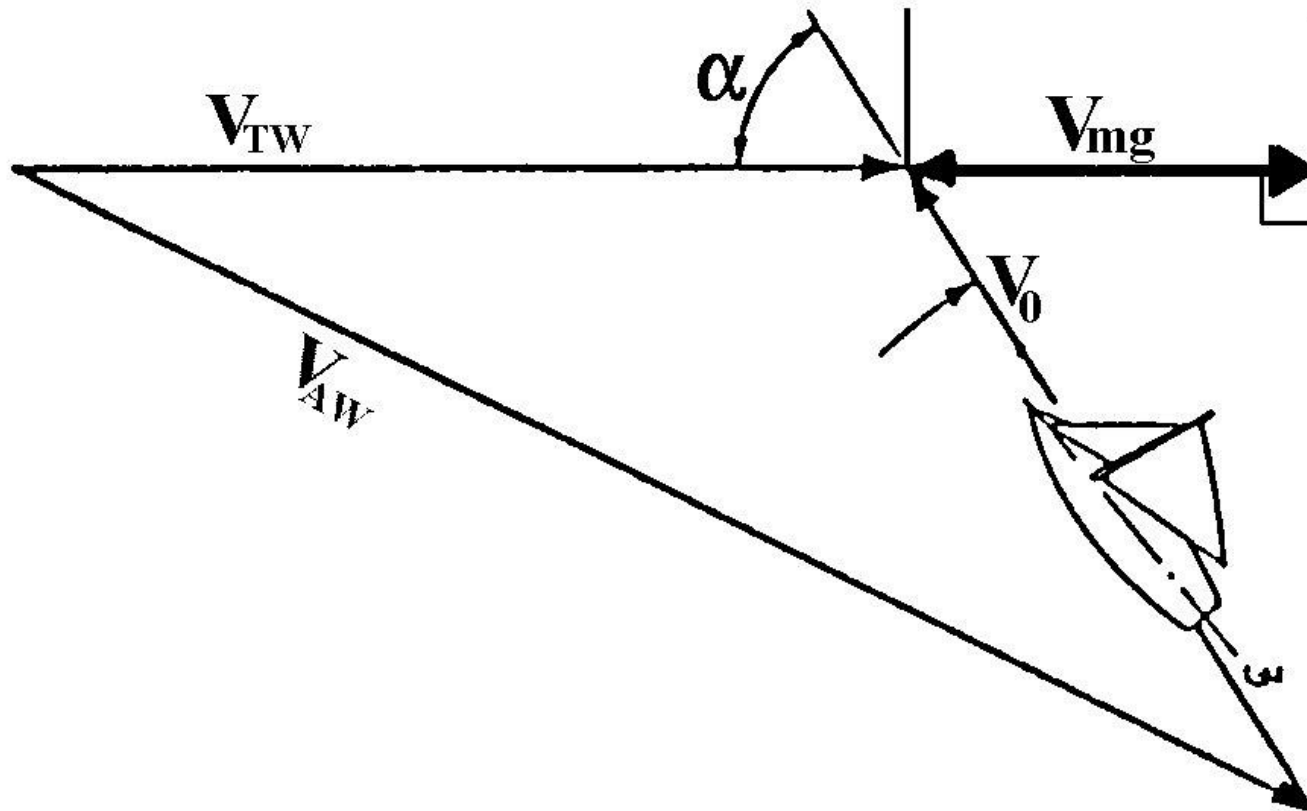
γ = invalshoek ware wind

β = invalshoek schijnbare wind



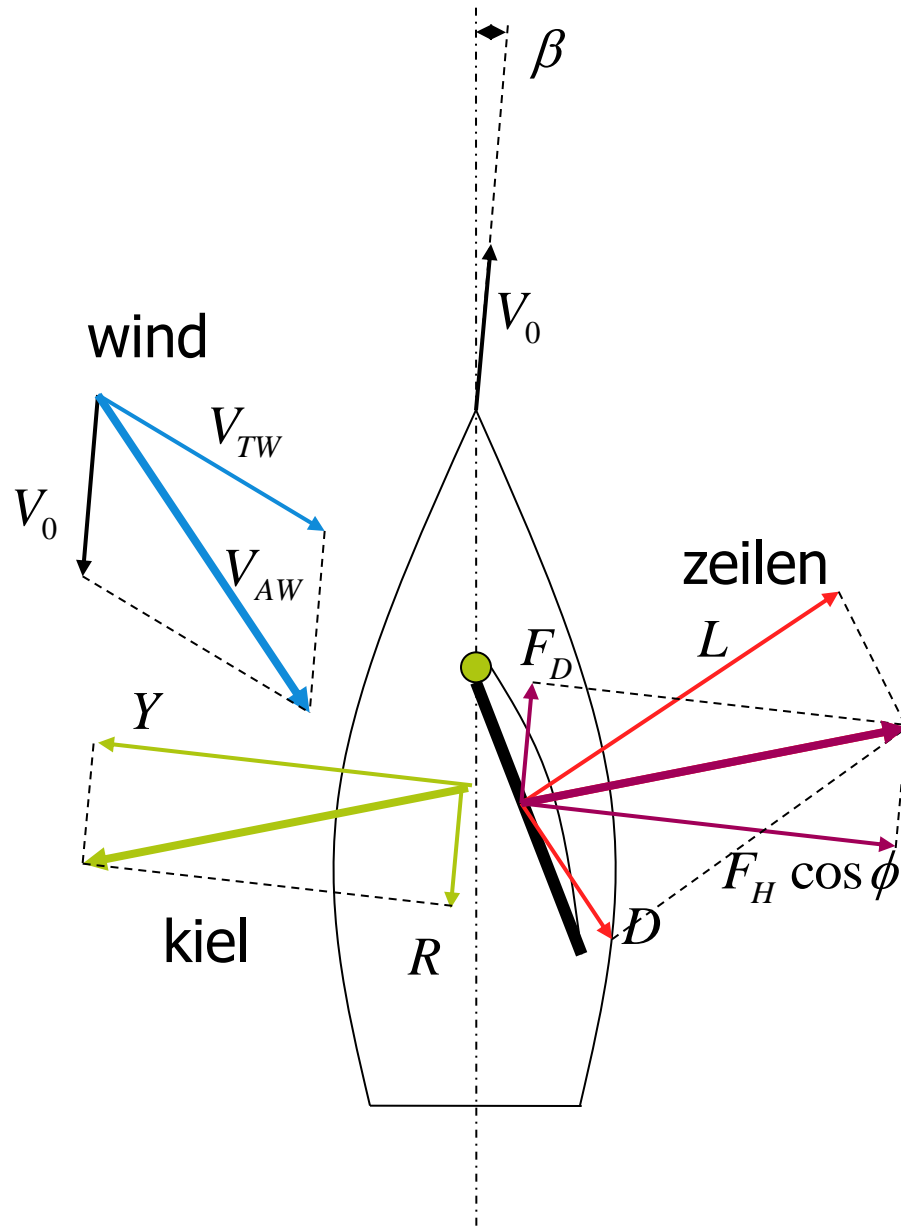
Zeilen

Velocity made good



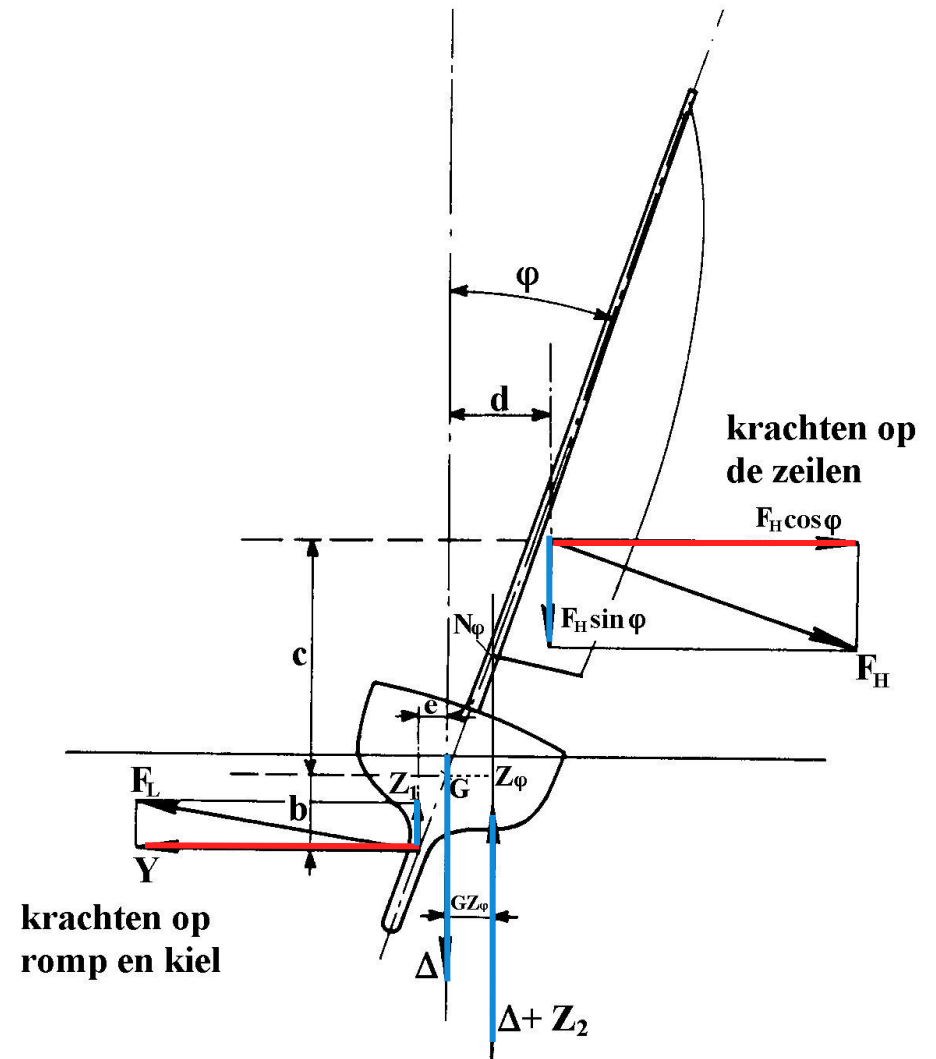
Zeilen

Evenwicht



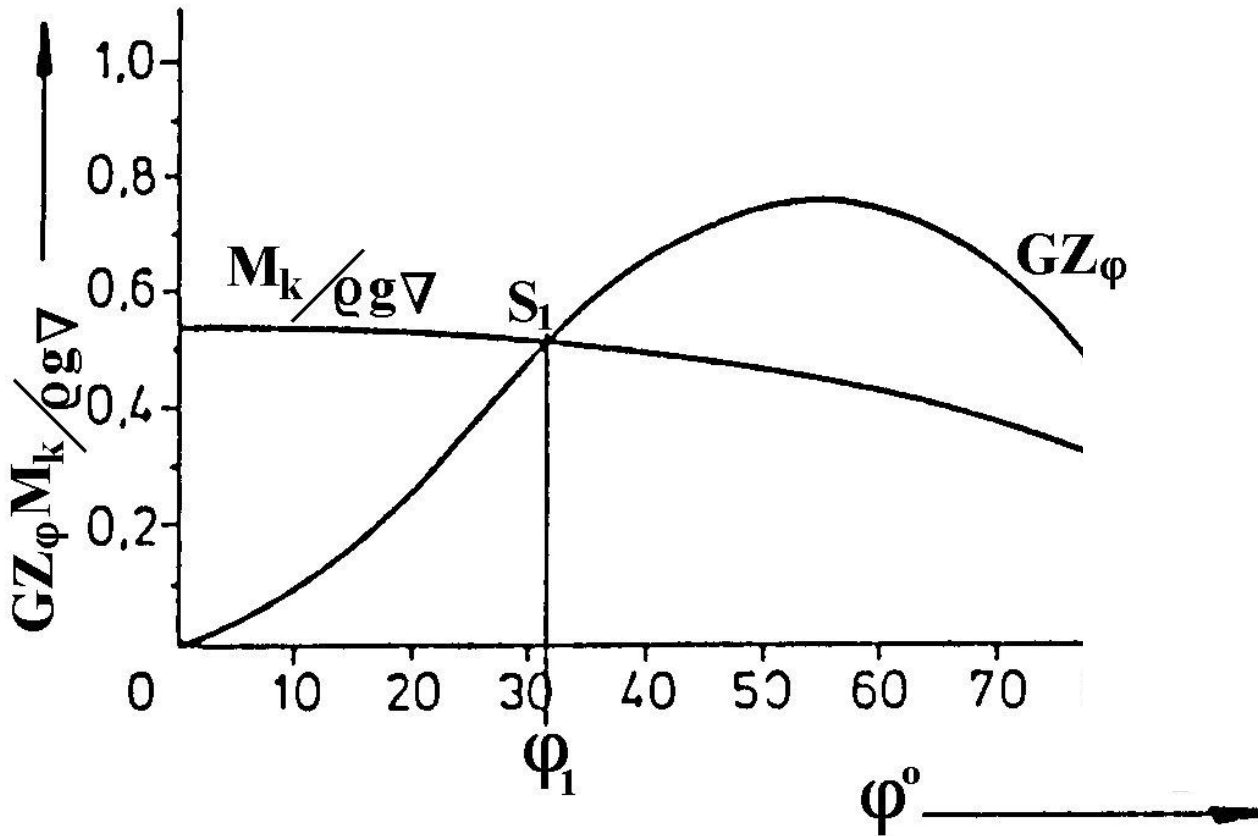
Zeilen

Evenwicht



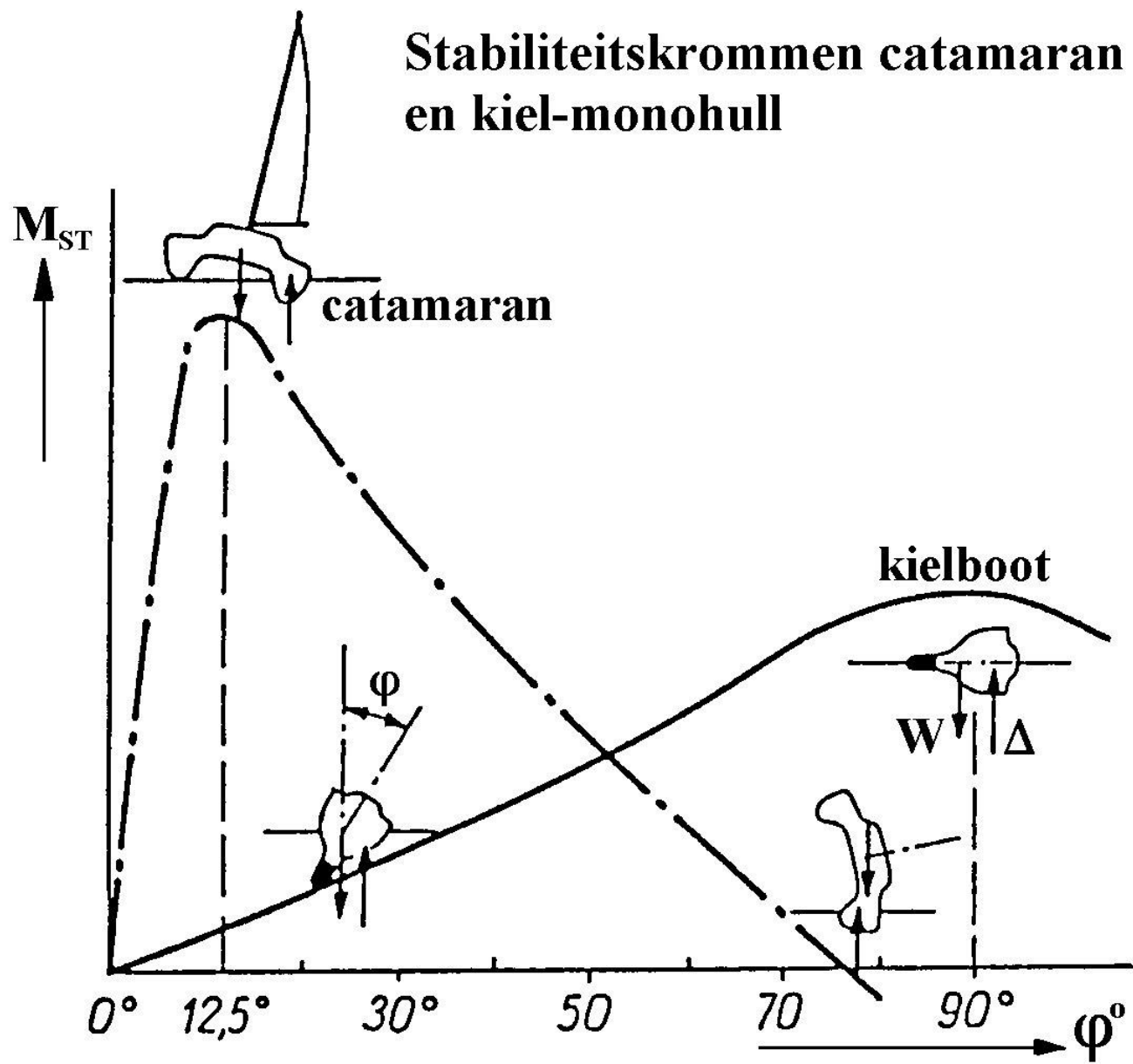
Zeilen

Hellingshoek



Zeilen Stabiliteit

Stabiliteitskrommen catamaran en kiel-monohull



Zeilen

VPP

Polair snelheidsdiagram van een zeiljacht

