CLAIMS

1. A method for controlling a magnus rotor (300) arranged on a vessel, comprising:

- providing pressure information related to different areas of a cross section from a first pressure sensor (302) arranged on a surface of the magnus rotor at a first height H1 with respect to a deck of the vessel;

- estimating pressure distribution on the surface of the magnus rotor based on the pressure information from the at least first pressure sensor and

- using the estimated pressure distribution as a feedback in closed-loop control method to optimise a control parameters of the magnus rotor.

2. A method according to claim 1, wherein the method further comprises

- providing angular position information of magnus rotor;

- estimating apparent wind angle based on the angular position information of magnus rotor and the estimated pressure distribution on the surface of the magnus rotor and

- using the estimated apparent wind angle for determining initial approximation for control parameters.

3. The method according to claim 1 or 2, wherein

- the angular position information is provided by an angular position measurement device;

- the control parameters comprise optimal rotation speed of the Magnus-rotor;

the method further comprising

- calculating wind speed u, by

    - calculating air density ρ based on atmospheric pressure p and temperature T, wherein the atmospheric pressure is either approximated by a pressure at a back side of the rotor or using a

dedicated sensor, and using equation (1) where $R_{(specific)}$ is specific gas constant for dry air

$$\rho = \frac{p}{R_{(specific)}T} \quad (1);$$

- calculating a maximum dynamic pressure q on the surface of the Magnus-rotor by subtracting the atmospheric pressure from a maximum pressure on the surface of the Magnus-rotor; and
- calculating the wind speed u using equation (2)

$$u = \sqrt{\frac{2q}{\rho}} \quad (2);$$

- using the estimated apparent wind angle to determine an optimal rotation direction of the Magnus-rotor; and
- using the calculated wind speed, in addition to the estimated apparent wind angle, to determine the initial approximation for control parameters.

4. The method according to claim 3, further comprising providing pressure information from at least a second pressure sensor (304), wherein
- the second pressure sensor is arranged at a second height H2 with respect to the deck of the vessel;
- a difference between the first height H1 and the second height H2 is at least 20 % of a total height H of the Magnus-rotor; and
- estimating pressure distribution is carried out by interpolating and extrapolating the pressure distribution on the surface of the Magnus-rotor based on the pressure information from the at least first pressure sensor (302) and second pressure sensor.

5. The method according to claim 4, further comprising arranging at least a third pressure sensor (306) on the surface of the Magnus-rotor, wherein the third pressure sensor is arranged at a third height H3 with respect to

the deck of the vessel and a difference between the first height H1, the second height H2 and the third height H3 is each at least 10 % of the total height H of the Magnus-rotor.

6. The method according to any of the claims 3-5, further comprising arranging a number of further pressure sensors on the surface of the Magnus-rotor, wherein each further pressure sensor is arranged at a given height with respect to the deck of the vessel and the difference between each height of the pressure sensors is at least 5 % of the total height H of the Magnus-rotor, and wherein the number is at least four.

7. The method according to any of the claims 4-6, wherein the pressure sensors (302, 304, 306) are arranged along a line that is substantially parallel to a rotation axis of the Magnus-rotor.

8. The method according to any of the claims 4-7, wherein the pressure sensors (302, 304, 306) are arranged along a spiral line.

9. The method according to any of the claims 3-8, further comprising
- measuring Magnus-rotor forces by combining flexural bending measurements and measurements of displacement of a bearing arranged at a connection of the Magnus-rotor and its foundation;
- using the measured Magnus-rotor forces as a feedback in the optimisation of the Magnus-rotor operation.

10. A method for controlling a system of magnus rotors (300) arranged on a vessel, comprising
- optimising the control parameters of each magnus rotor according to the method of any of the claims 1-9; and
- optimising a total efficiency of the magnus rotors using closed-loop control, by taking into account the interaction between each magnus rotor by measuring the individual differences in performance;

wherein the magnus rotors are arranged at different positions on the vessel, with respect to a length of the vessel.

11. A vessel comprising at least two magnus rotors (300), each magnus rotor comprising at least a first pressure sensor (302), wherein the first pressure sensor is arranged on a surface of the magnus rotor at a first height H1 with respect to a deck of the vessel, and the vessel is further equipped with means for carrying out the method of any of the claims 1-10.

12. A software product recorded on non-transient machine-readable data storage media, wherein the software product is executable upon computing hardware for implementing a method of any of the claims 1-11.