

# A New Method of Measuring Sail Speed

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## Abstract:

The author found a rule through experiments, that is, the speed of an object falling on the water surface is directly proportional to the diffusion rate of the water wave stirred up. This finding can help to obtain the sail speed of a specific target by measuring the diffusion rate of water wave.

## Introduction

To calculate the speed of a moving body, the traditional method is to divide the movement distance of the moving body by the time consumed. However, to calculate the sail speed of a ship that can't be observed, then the above method will not work. Although people can use some means to solve this problem, the calculation accuracy and specific operation are not very ideal. Recently, the author was inspired by an experiment and came up with a solution to this problem. The method is to measure the speed of the water wave stirred up by invisible ships in the sailing process, and then substitute the measured results into a formula to calculate the sail speed. The application principle and calculation formula of the method are introduced below.

**Key words: Sail speed**

## 1. Application principle and calculation formula

The author has done some throwing experiments on a quiet river to observe whether there is a correspondence between the momentum and the diffusion rate of water waves. In this process, it was unexpectedly found that the diffusion rate of water wave is determined by the movement speed of moving body in the water body. Intuitively speaking, the faster a moving body contacts or collides with the water body, the faster the diffusion rate of the water wave stirred up is. Inspired by this, if the speed (a) of a moving body colliding with the water body and the aroused diffusion rate (b) of the water wave are obtained and taken as the reference values, then the diffusion rate (c) of the water wave stirred up by the ship during sailing can be calculated, and the sail speed (d) of corresponding ship can be obtained.

The calculation method is as follows

$$d=c/b*a$$

In addition, it should be noted that the water waves generated by the ship hull should not be confused with those generated by the propeller in the measuring process.

## **2.Conclusion**

Although there may be some technical obstacles in the application of this principle at the current stage, its importance will gradually emerge with the progress of water wave detection technology. In addition, the author believes that this principle may be used to calculate the speed of space moving body with the diffusion rate of gravitational wave in the future, because the two kinds of waves are similar in geometrical morphology and generating principle.