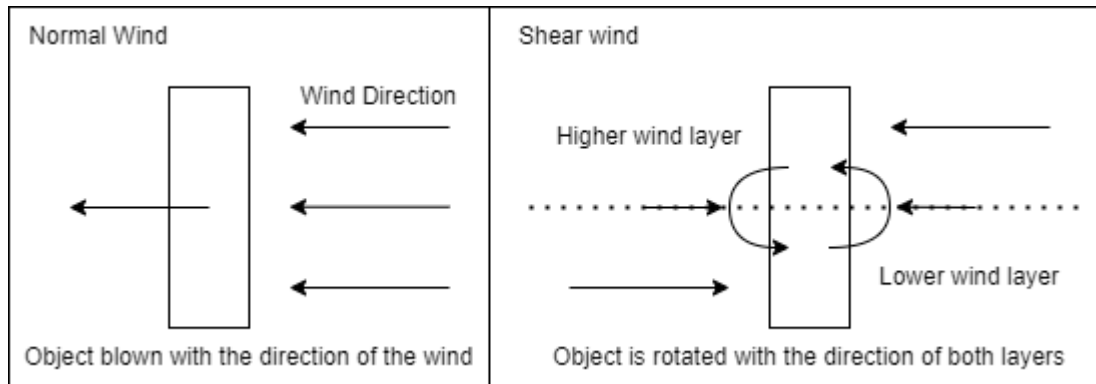


# Shear Wind Calculation Documentation

## What is shear wind?

Shear wind is the difference in wind speed and direction between two "layers" of air. Shear wind acts differently upon objects than regular wind, as the wind is not evenly distributed on the object.



Shear wind can be experienced multiple places, but for this case, we will focus on shear wind between pressure bands.

## Calculating shear wind

Some vector math is required to understand the calculations, but it is quite simple and easy to understand.

### Vector math

We need two vector skills in order to be able to calculate the shear wind. Vector addition/subtraction and calculating the length (absolute value) of a vector.

[Here is a link to a norwegian page explaining vectors.](#)

[Here is a link to a english page explaining vectors.](#)

### The calculation

If we have the wind vectors (north is positive latitude and east is positive longitude) we are interested in the difference between the higher and lower wind vectors in order to calculate the shear wind. Using subtraction we can subtract the lower from the higher (or the higher from the lower) wind vector in order to obtain a vector denoting the difference between the two vectors. Taking the absolute value of

the new vector we can calculate the magnitude of the vector.

We are currently not interested in the direction of the shear wind, only the magnitude.