

Velocity Vector

Engineering Fluid Mechanics

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$$\vec{V}(\vec{D}, t)$$

VELOCITY VECTOR = CHANGE IN
DISPLACEMENT
OVER TIME

DISPLACEMENT VECTOR

$$\vec{D}(t) = x \hat{i} + y \hat{j} + z \hat{k}$$

UNIT VECTORS

$$\vec{V} = \left(\frac{d\vec{D}}{dt}, t \right) = \frac{d}{dt} (\vec{D}(t)) = \frac{dx}{dt} \hat{i} + \frac{dy}{dt} \hat{j} + \frac{dz}{dt} \hat{k}$$

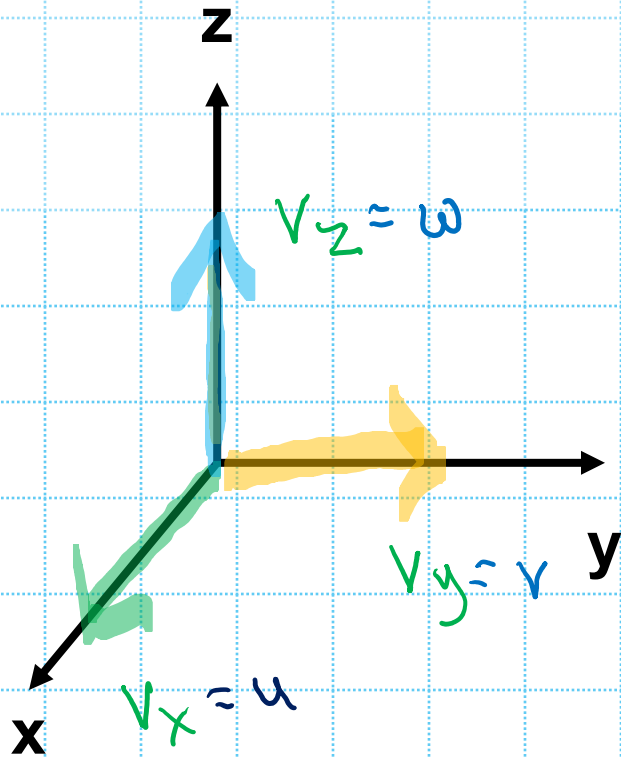
$$\frac{dx}{dt} = v_x$$

$$\frac{dy}{dt} = v_y$$

$$\frac{dz}{dt} = v_z$$

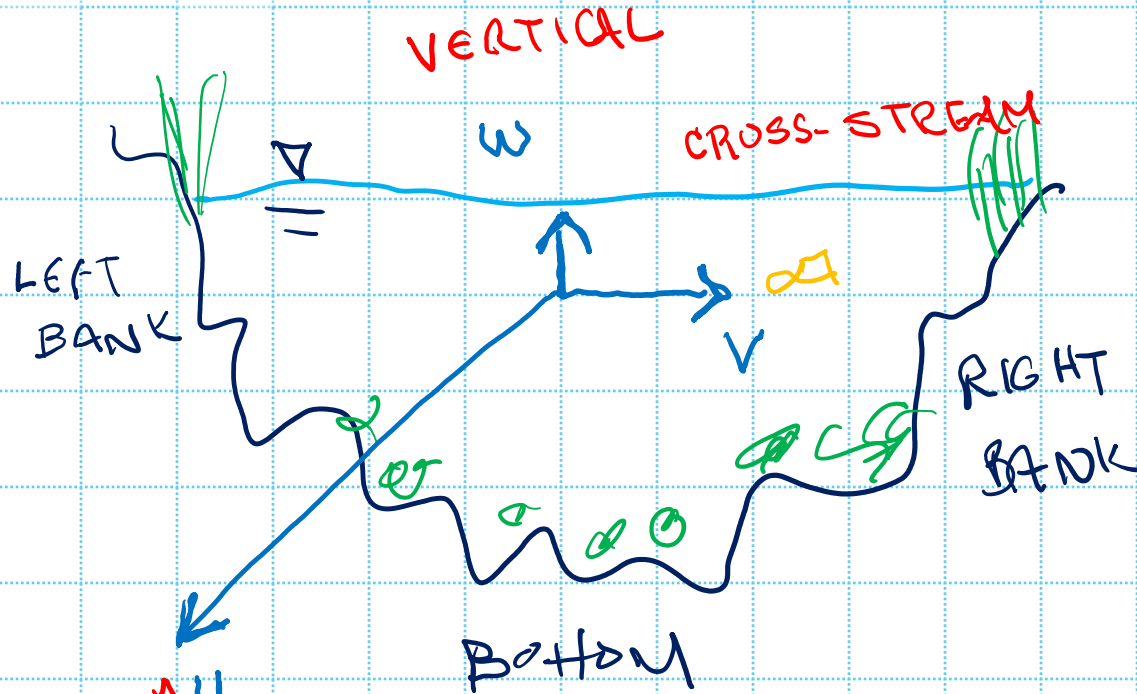
Velocity Vector





$$\vec{V}(\vec{D}, t) = u \hat{i} + v \hat{j} + w \hat{k}$$

STREAMWISE



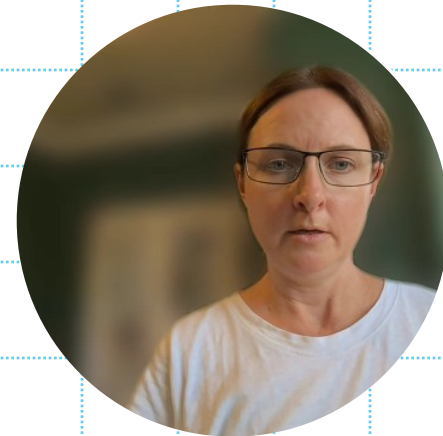
Velocity Vector





Acknowledgement

This material is based upon work partially supported by the National Science Foundation under Grant# 2335802. Any opinions, findings, and conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



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THE END



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