VECTOR NOTATION

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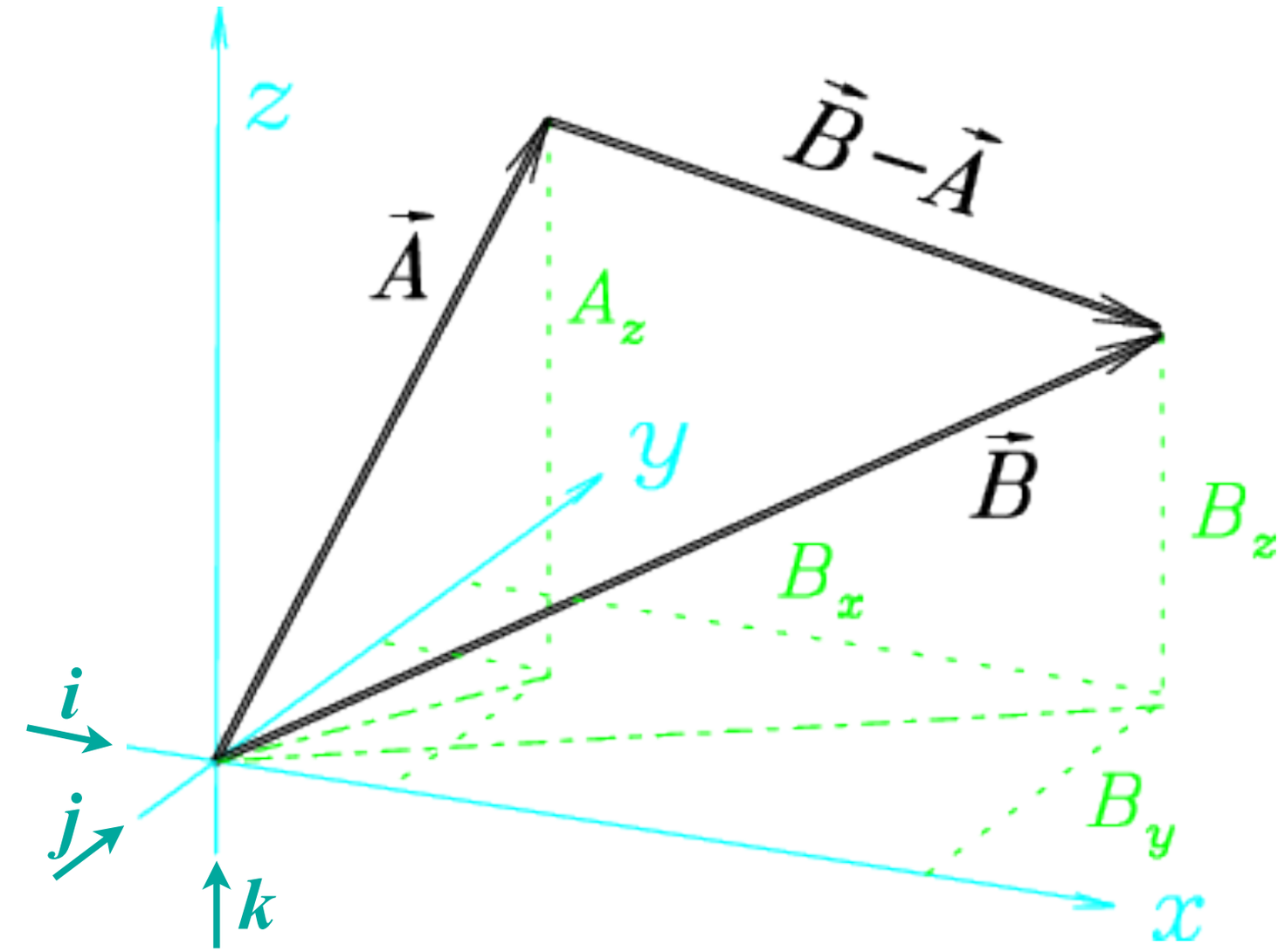
Vector Addition & Subtraction



Unit Vectors

$$\boldsymbol{A} = A_x\,\boldsymbol{i} + A_y\,\boldsymbol{j} + A_z\,\boldsymbol{k}$$

$$\boldsymbol{B} = B_x\,\boldsymbol{i} + B_y\,\boldsymbol{j} + B_z\,\boldsymbol{k}$$

$$\begin{aligned}\boldsymbol{B} - \boldsymbol{A} \;=\; & (B_x - A_x)\,\boldsymbol{i} \\ & + (B_y - A_y)\,\boldsymbol{j} \\ & + (B_z - A_z)\,\boldsymbol{k}\end{aligned}$$

Note that if we ADD
$\boldsymbol{B} - \boldsymbol{A}$ *to* $\boldsymbol{A}$
"tip to tail"
we get $\boldsymbol{B}$ *,*
as expected.

Multiplication of Vectors

Let $\boldsymbol{A} = A_x\,\boldsymbol{i} + A_y\,\boldsymbol{j} + A_z\,\boldsymbol{k}$ and $\boldsymbol{B} = B_x\,\boldsymbol{i} + B_y\,\boldsymbol{j} + B_z\,\boldsymbol{k}$

The ***scalar*** product $\boldsymbol{A} \cdot \boldsymbol{B} = A_x\,B_x + A_y\,B_y + A_z\,B_z$

The ***vector*** product

$$\begin{aligned}\boldsymbol{A} \times \boldsymbol{B} = {} & (A_y\,B_z - A_z\,B_y)\,\boldsymbol{i} \\ & + (A_z\,B_x - A_x\,B_z)\,\boldsymbol{j} \\ & + (A_x\,B_y - A_y\,B_x)\,\boldsymbol{k}\end{aligned}$$