VECTOR NOTATION

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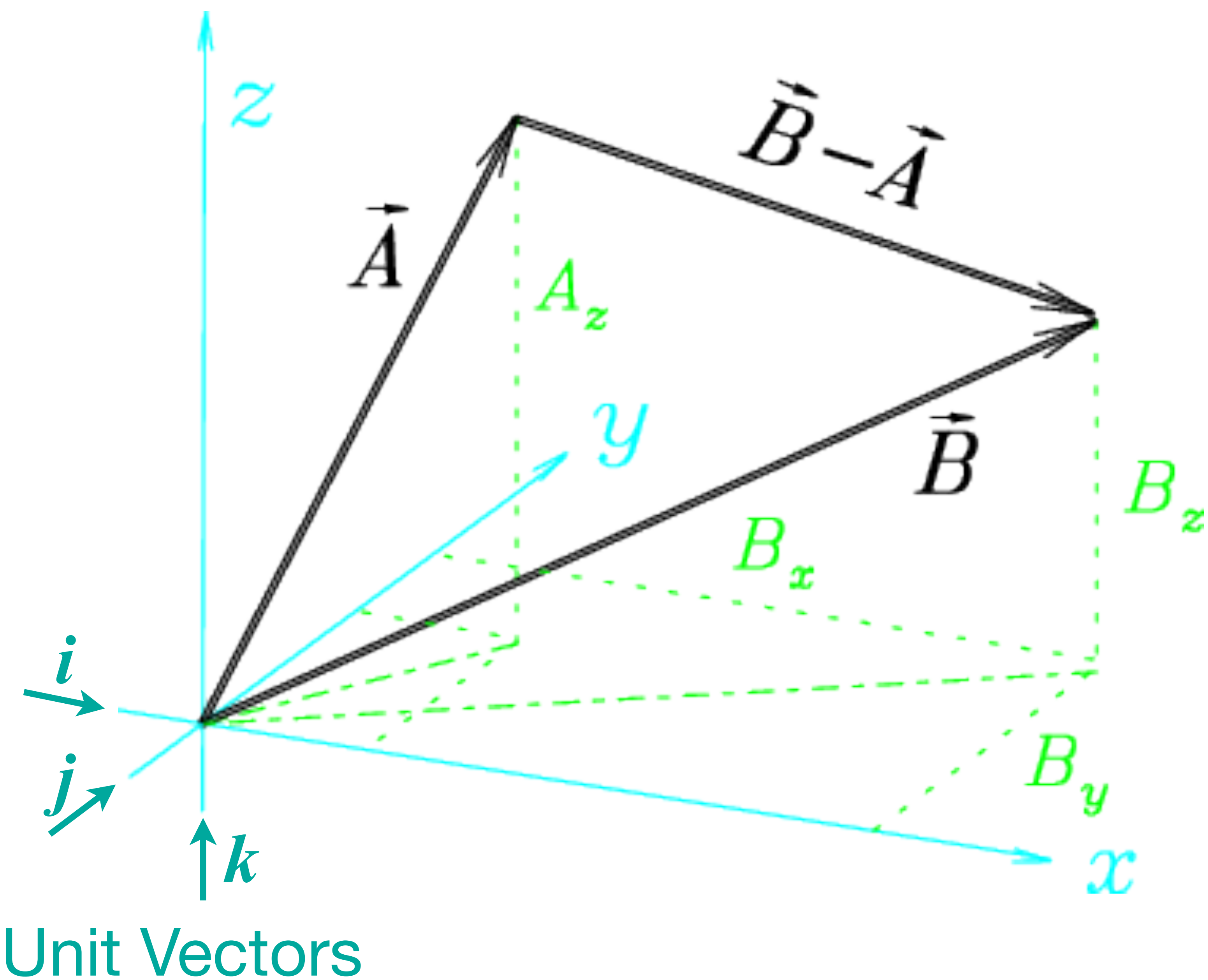
Vector Addition & Subtraction

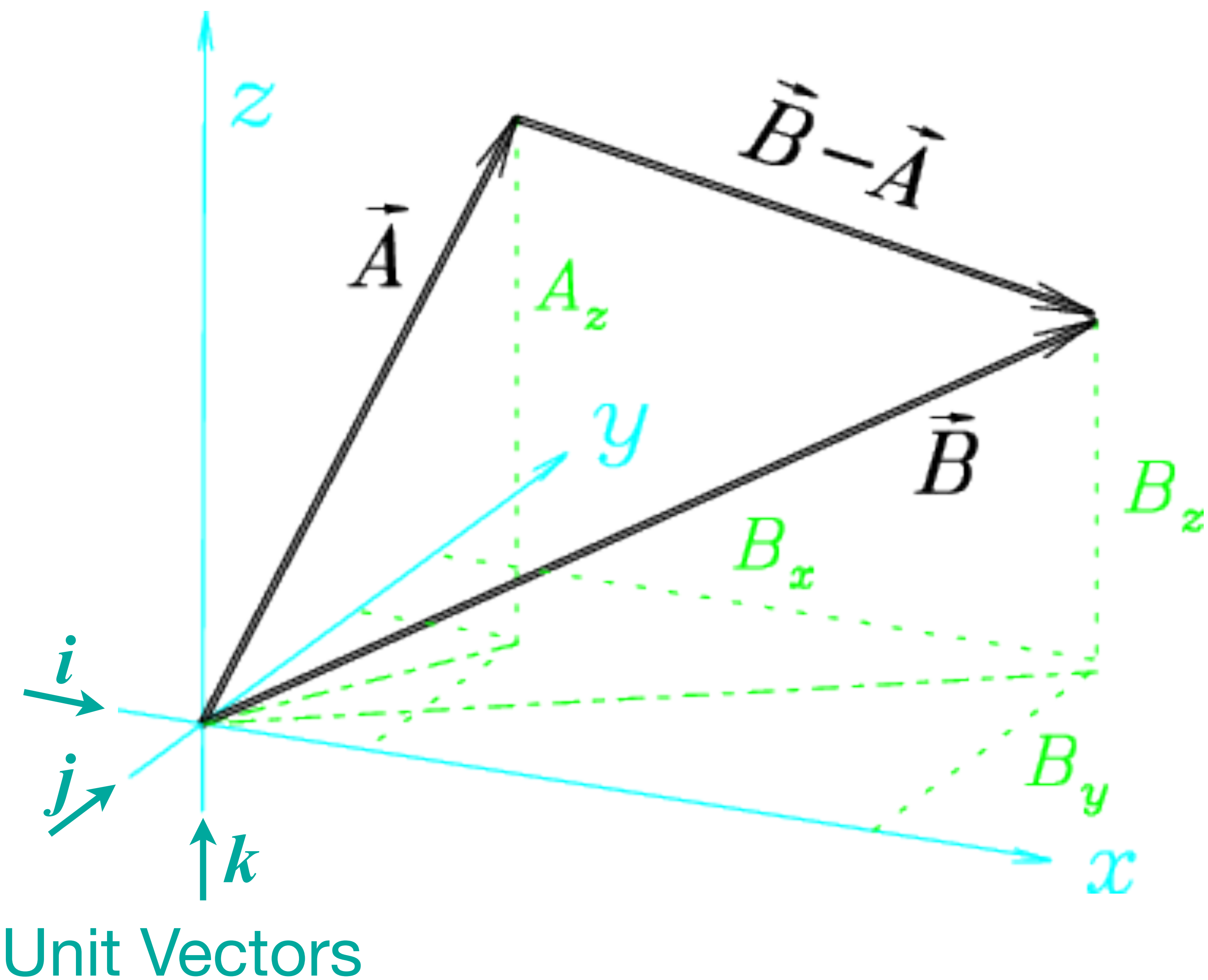


$$\boldsymbol{A} = A_x\,\boldsymbol{i} + A_y\,\boldsymbol{j} + A_z\,\boldsymbol{k}$$

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

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

Vector Addition & Subtraction



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

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

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

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

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

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The ***vector*** product

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