Prodotto vettoriale

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$$f : \mathbb{R}^3 * \mathbb{R}^3 \to \mathbb{R}^3$$
$$(\underline{v}, \underline{w}) \to \underline{v} \wedge \underline{w}$$

1   Definizione

Siano $\underline{v}, \underline{w} \in \mathbb{R}^3$. Il **prodotto vettoriale** $\underline{v} \wedge \underline{w} \in \mathbb{R}^3$ è definito dall'espressione:

$$v = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}, w = \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix}$$

$$v \wedge w = \det\left(\begin{bmatrix} \underline{i} & \underline{j} & \underline{k} \\ x_1 & x_2 & x_3 \\ y_1 & y_2 & y_3 \end{bmatrix}\right) =$$

$$(x_2 y_3 - x_3 y_2)\underline{i} - (x_1 y_3 - x_3 y_1)\underline{j} + (x_1 y_2 - x_2 y_1)\underline{k}$$

$$\text{Dove } \underline{i} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \underline{j} = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}, \underline{k} = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$$