which is never null, and thus, $\mu = 0$, but since $(\overrightarrow{a_0a_1}, \ldots, \overrightarrow{a_0a_m})$ is a basis of $\overrightarrow{E}$, we must also have $\lambda_i = 0$ for all $i, 1 \leq i \leq m$.

Given any element $\langle x, \lambda \rangle \in \widehat{E}$, if

$$x = a_0 + x_1\overrightarrow{a_0a_1} + \cdots + x_m\overrightarrow{a_0a_m}$$

over the affine frame $(a_0, (\overrightarrow{a_0a_1}, \ldots, \overrightarrow{a_0a_m}))$ in E, in view of the definition of $\widehat{+}$, we have

$$\begin{aligned} \langle x, \lambda \rangle &= \langle a_0 + x_1\overrightarrow{a_0a_1} + \cdots + x_m\overrightarrow{a_0a_m}, \lambda \rangle \\ &= \langle a_0, \lambda \rangle \,\widehat{+}\, \lambda x_1\overrightarrow{a_0a_1} \,\widehat{+}\, \cdots \,\widehat{+}\, \lambda x_m\overrightarrow{a_0a_m}, \end{aligned}$$

which shows that over the basis $(\overrightarrow{a_0a_1}, \ldots, \overrightarrow{a_0a_m}, a_0)$ in $\widehat{E}$, the coordinates of $\langle x, \lambda \rangle$ are

$$(\lambda x_1, \ldots, \lambda x_m, \lambda).$$

$\square$

If $(x_1, \ldots, x_m)$ are the coordinates of x w.r.t. the affine frame $(a_0, (\overrightarrow{a_0a_1}, \ldots, \overrightarrow{a_0a_m}))$ in E, then $(x_1, \ldots, x_m, 1)$ are the coordinates of x in $\widehat{E}$, i.e., the last coordinate is 1, and if u has coordinates $(u_1, \ldots, u_m)$ with respect to the basis $(\overrightarrow{a_0a_1}, \ldots, \overrightarrow{a_0a_m})$ in $\overrightarrow{E}$, then u has coordinates $(u_1, \ldots, u_m, 0)$ in $\widehat{E}$, i.e., the last coordinate is 0. Figure 25.3 shows the affine frame (a_0, a_1, a_2) in E viewed as a basis in $\widehat{E}$.

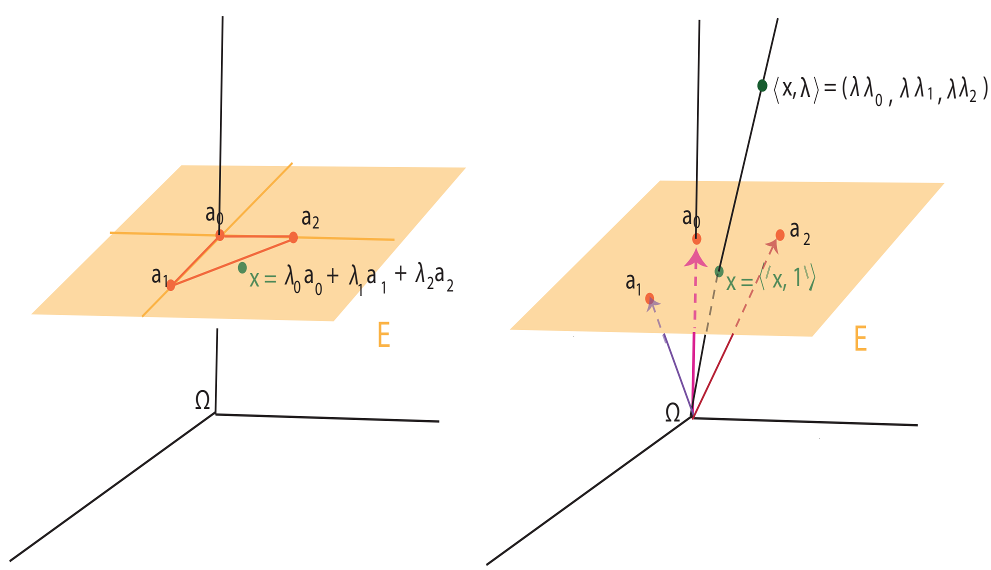

Figure 25.3: The basis (a_0, a_1, a_2) in $\widehat{E}$.