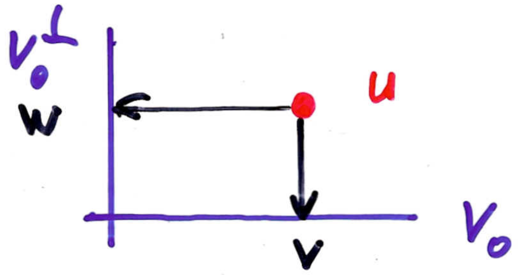
- **Exercise 2.3:**

Show that the inf-sup-condition (8) is equivalent to the following decomposition property:

$\forall u \in X \;\; \exists!\, v \in V_0 = \operatorname{Ker} B \;\wedge\; w \in V_0^{\perp}$:

a) $u = v + w$

b) $\|w\|_X \leq \frac{1}{\beta_1} \|Bu\|_{\Lambda^*}$



- **Exercise 2.5:** $\longrightarrow$ Tutorial 05

Show <u>directly</u> that under the assumptions of Theorem 2.4 the homogeneous MVP

$$(2)_0 \quad \begin{cases} a(u,v) + b(v,\lambda) = 0 & \forall v \in X \\ b(u,\mu) = 0 & \forall \mu \in \Lambda \end{cases}$$

has only the trivial solution

$$(u,\lambda) = (0,0) \in X \times \Lambda,$$

i.e. we have uniqueness!