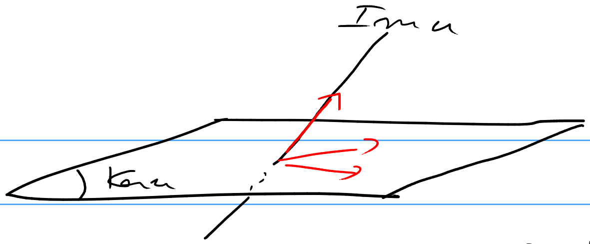

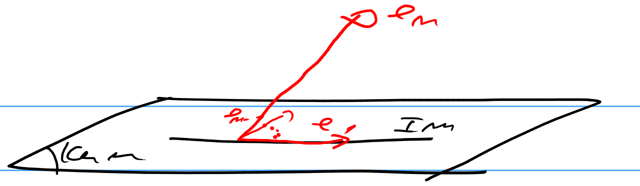

$u \in \mathcal{L}(E)$ ($\dim = n$), $rg(u) = 1$

$\dim(\mathrm{Im}\, u) = 1$
$\dim(\mathrm{Ker}\, u) = n-1$

$\mathrm{Ker}\, u \cap \mathrm{Im}\, u$: sev de Im u) droite

- $\mathrm{Ker} \cap \mathrm{Im} = \{0\} \Rightarrow$ supplémentaires
- $\cap = \mathrm{Im}$: $\mathrm{Im}\, u \subset \mathrm{Ker}\, u$

$\boxed{E = \mathrm{Ker}\, u \oplus \mathrm{Im}\, u}$	$\boxed{\mathrm{Im}\, u \subset \mathrm{Ker}\, u}$
$\mathrm{Mat}(u, \mathcal{E}) = \begin{array}{c} u(e_1) \cdots u(e_{n-1})\ u(e_n) \\ \begin{pmatrix} 0 & \cdots & 0 & 0 \\ \vdots & & \vdots & \vdots \\ & & & 0 \\ 0 & \cdots & 0 & \alpha \end{pmatrix} \end{array} \begin{array}{c} e_1 \\ \vdots \\ e_n \end{array}$	$\mathrm{Mat}(u, \mathcal{E}) = \begin{array}{c} u(e_1) \cdots u(e_{n-1})\ u(e_n) \\ \begin{pmatrix} 0 & & 0 & \alpha \\ & \ddots & & 0 \\ & & \ddots & \\ 0 & & 0 & 0 \end{pmatrix} \end{array} \begin{array}{c} e_1 \\ \vdots \\ e_n \end{array}$
→ u est DZ	→ u n'est pas DZ $(e_1, \dots, e_{n-1}, \frac{e_n}{\alpha})$
→ $\mathrm{tr}\, u = \alpha \neq 0$	→ $\mathrm{tr}(u) = 0$
→ $u^2 = \alpha u = \mathrm{tr}(u) u$	→ $u^2 = 0 = \mathrm{tr}(u) u$

$X^2 - \mathrm{tr}(u) X$ est annulateur
$X(X - \mathrm{tr}\, u)$ scindé à racines simples