

The incompressibility limit $\lambda \rightarrow \infty$ ($\nu \rightarrow \frac{1}{2}$):

- The theory of MVFWPT (cf. Subsection 2.3) gives the uniform convergence

$$(27) \begin{pmatrix} u(t) \\ p(t) \end{pmatrix} := L^{-1}(t) \begin{pmatrix} F \\ G \end{pmatrix} \xrightarrow[t=\lambda^{-1/2} \rightarrow 0]{\text{uniformly}} \begin{pmatrix} u(0) \\ p(0) \end{pmatrix} := L^{-1}(0) \begin{pmatrix} F \\ G \end{pmatrix}$$

in $X \times \Lambda$, where $(u(0), p(0)) \in X \times \Lambda$ is the solution for incompressible materials ($\nu = 1/2$):

(28) Find $u = u(0) \in X$ and $p = p(0) \in \Lambda$:

$$2\mu (\varepsilon(u), \varepsilon(v))_0 + (\operatorname{div} v, p)_0 = \langle F, v \rangle \quad \forall v \in X$$

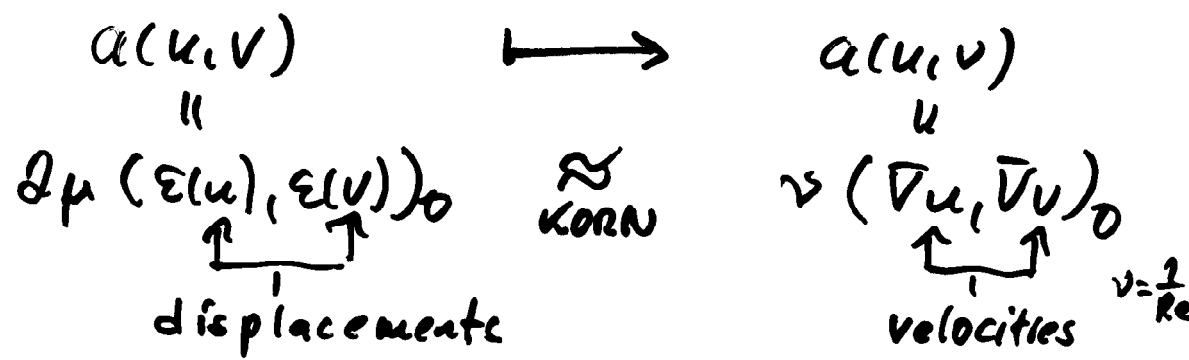
$$(\operatorname{div} u, q)_0 = 0 \quad \forall q \in \Lambda$$

• Exercise 3.12:

Prove (27) with the help of the results of Theorem 2.13!

- Remark: (28) is very similar to STOKES:

Incompressible elastostatics (28) — STOKES problem



- same spaces X and Λ !
- same bilinear form $b(\cdot, \cdot)$!
- same LBB!
- same THEORY and NUMERICS!