(10)

- $H^{1/2}(\Gamma) \simeq \gamma_0 H^1(\Omega)$

$$H^{1/2}(\Gamma) := \gamma_0 H^1(\Omega) \simeq H^{1/2}(\Gamma) := \{ g \in L_2(\Omega) : |g|_{H^{1/2}(\Gamma)} < \infty \}$$

$$\begin{array}{ccc} \Psi & & \Psi \\ g = \gamma_0 u & & g \end{array}$$

$$\|g\|_{H^{1/2}(\Gamma)} := \inf_{\substack{u \in H^1(\Omega) \\ \gamma_0 u = g}} \|u\|_{H^1(\Omega)} \simeq \|g\|_{H^{1/2}(\Gamma)} := \left(\|g\|^2_{L_2(\Gamma)} + |g|^2_{H^{1/2}(\Gamma)} \right)^{1/2}$$

norm equivalence (see Def. 2.12)

with the $H^{1/2}$-semi-norm

$$|g|^2_{H^{1/2}(\Gamma)} := \int_\Gamma \int_\Gamma \frac{|g(x) - g(y)|^2}{|x-y|^{(d-1)+1}} \, dy \, dx$$

- **Def. 2.12:** $\|\cdot\|_{(1)} \simeq \|\cdot\|_2$

Two norms $\|\cdot\|_{(1)}$ and $\|\cdot\|_{(2)}$ defined on some Linear space X are called equivalent iff $\exists$ positive, fixed constantant $\underline{c}$ and $\bar{c}$ such that

$$\underline{c} \|u\|_{(2)} \leq \|u\|_{(1)} \leq \bar{c} \|u\|_{(2)} \quad \forall u \in X.$$