

Weak implementation of Neumann/Dirichlet

(4)

b.c. using Robin b.c.

$$a \partial_n u + \gamma(u - u_b) = g \quad \text{on } \Gamma$$

$$\gamma = 0 \Rightarrow \text{Neumann} \quad a \partial_n u = g \quad \text{on } \Gamma$$

$$\gamma = \infty \Rightarrow \text{Dirichlet} \quad u = u_b \quad \text{on } \Gamma$$

This is used in Puffin.

Adaptivity & Error control

In lecture 4 we will prove the following a posteriori error estimate:

$$\|\nabla u - \nabla U\| \leq C_i \|h R(U)\|$$

with the residual $R(U) = |f + \Delta U|$

$C_i \approx 0.1$ and $h = h(x)$ is the mesh function

For p.w. linear basis V_h ; $\Delta U = 0$.

How can we approximate ΔU for $U \in V_h$?