

PECIAL RE OL ION

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$\frac{1}{2} \frac{d}{dt} \int_{\Omega} |u|^2 dx = \int_{\Omega} u \frac{du}{dt} dx = \int_{\Omega} u \left(-\Delta u + \nabla \cdot (u \nabla u) \right) dx$
 $= -\int_{\Omega} |\nabla u|^2 dx + \int_{\Omega} \nabla \cdot (u \nabla u) dx = -\int_{\Omega} |\nabla u|^2 dx + \int_{\partial \Omega} u \nabla u \cdot \nu dx$
 $= -\int_{\Omega} |\nabla u|^2 dx + \int_{\partial \Omega} u \frac{\partial u}{\partial \nu} dx$

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