On some compact embeddings in various Hilbert complexes

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(Joint work with Ralf Hiptmair, Dirk Pauly, Clemens Pechstein, Walter Zulehner)

We investigate new compact embedding results related to some Hilbert complexes, such as

- the classical de Rham complex for vector fields,

- the classical de Rham complex for differential forms,

- the elasticity complex,

- and the biharmonic complex.

Our results hold for general bounded strong Lipschitz domains of arbitrary topology and rely on regular decompositions and regular potentials. Using a general functional analysis framework (fa-toolbox) we are able to show closed ranges, Friedrichs/Poincaré type estimates, Helmholtz type decompositions, and finite cohomology groups.

This talk is strongly related to the one of Dirk Pauly and Walter Zulehner.

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