

# Triples of closely embedded Hilbert spaces and Dirichlet type spaces on the unit polydisc

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We obtain a general concept of triplet of Hilbert spaces with closed embeddings instead of continuous ones, first by a model associated to a positive selfadjoint operator  $H$  that is one-to-one but may not have a bounded inverse. Existence and uniqueness results for these generalized triplets of Hilbert spaces are obtained. As an illustration of the abstract theory we show how rather general weighted  $L^2$  spaces yield this kind of generalized triplets of Hilbert spaces for which the underlying spaces and operators can be explicitly calculated. Then we show that generalized triplets of Hilbert spaces with closed embeddings can be naturally associated to any pair of Dirichlet type spaces  $\mathcal{D}_\alpha(\mathbb{D}^N)$  of holomorphic functions on the unit polydisc  $\mathbb{D}^N$  and we explicitly calculate the associated operators in terms of reproducing kernels and radial derivative operators. Finally, a rigging of the Hardy space  $H^2(\mathbb{D}^N)$  through a scale of Dirichlet type spaces is also presented.

The talk is based on joint work with P. Cojuhari.