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REGULARIZATION METHODS FOR SOLVING THE SPLIT FEASIBILITY PROBLEM WITH MULTIPLE OUTPUT SETS IN HILBERT SPACES

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Abstract. We study the split feasibility problem with multiple output sets in Hilbert spaces. In order to solve this problem, we introduce several new iterative processes by using the Tikhonov regularization method.

1. Introduction

Let C and Q be nonempty, closed and convex subsets of real Hilbert spaces H_1 and H_2, respectively. Let $T\colon H_1 \to H_2$ be a bounded linear operator and let $T^*\colon H_2 \to H_1$ be its adjoint. The *split convex feasibility problem* (SCFP, for short) is formulated as follows:

$$\text{Find an element } x^* \in C \text{ such that } Tx^* \in Q. \tag{1.1}$$

The SCFP was first introduced by Y. Censor and T. Elfving [6] in order to model certain inverse problems. It plays an important role in medical image reconstruction and in signal processing (see [3], [4]). Since then, several iterative

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