

Stabilized Solution and Numerical Simulation for a Two-Dimensional Hausdor[®] Moment Problem[⌘]

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Abstract

In this paper we consider a two-dimensional Hausdor[®] moment problem(2-D HMP) to recover an unknown function from a finite number of moments contaminated by noise. The 2-D HMP is a severely ill-posed problem due to the well-known reason. In order to obtain its conditional stability, we transform equivalently the 2-D HMP into two 1-D HMPs. Utilizing our results we have derived for the 1-D HMP by the integral equation methods, We establish a conditional stability estimate for the 2-D HMP. On basis of the conditional stability, we present an algorithm to show reconstruction of the function and prove an error estimate for the algorithm. Finally we provide some numerical examples to test the theoretical results. The numerical simulation shows the efficiency and sound implementation of the given algorithm.

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