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Caixing Gu* (cgu@calpoly.edu), Department of Mathematics, California Polytechnic State University, San Luis Obispo, CA 93407, and **Dong-O Kang**, Department of Mathematics, Chungnam National University, Daejeon, 34134, South Korea. *An inverse problem for kernels of block Hankel operators.*

By Beurling-Lax-Halmos theorem the kernel of a block Hankel operator is described by an associated inner matrix. When the inner matrix is square, there is an explicit relation between the symbol function of the block Hankel operator and the inner matrix. When the inner matrix is not square, little is known for the connection of the symbol function and the inner matrix. Recently, an insightful index of a matrix-valued function illuminates a numerical relation between the index of the symbol and the size of the non-square inner matrix. In this paper, we find the explicit relation between a class of symbols of the block Hankel operators and their associated non-square inner matrices. The basic result states that the symbol can be factorized into the product of a structured matrix with a certain index, otherwise free, and the adjoint of a square matrix which is a completion of the non-square inner matrices. (Received January 16, 2019)