1011-05-248 **Ada Chan** and **Chris Godsil*** (`cgodsil@uwaterloo.ca`), Combinatorics & Optimization, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada. *Type-II Matrices.*

The *Schur product* $M \circ N$ of two $m \times n$ matrices M and N is the $m \times n$ matrix with ij-entry $M_{i,j}N_{i,j}$. If the entries of M are non-zero, the *Schur inverse* $M^{(-)}$ satisfies $M \circ M^{(-)} = J$, where J is the all-ones matrix. Finally, an $n \times n$ matrix W is a type-II matrix if

$$W^{(-)} = n(W^{-1})^T.$$

(Hadamard matrices provide one class of examples.)

Type-II matrices have interesting connections to link invariants and to association schemes. In this talk I will summarize some of their basic properties, and show how they arise in connection with a range of combinatorial objects. (Received August 29, 2005)