

## TOTALLY POSITIVE COMPLETIONS FOR MONOTONICALLY LABELED BLOCK CLIQUE GRAPHS\*

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**Abstract.** It is shown that if the connected graph of the specified entries of a combinatorially symmetric, partial totally positive matrix is monotonically labeled block clique, then there is a totally positive completion. Necessarily the completion strategy is very different from and more complicated than the known totally nonnegative one. The completion preserves symmetry and can be used to solve some non-connected or rectangular, nonsymmetric completion problems.

**Key words.** Totally positive matrix completion problems, Partial matrix, Monotonically labeled block clique graph.

**AMS subject classifications.** 15A15, 15A57, 05C50.

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