1037-57-310 **Qi Chen** (chenqi@wssu.edu), Department of Mathematics, Winston-Salem State University, Winston-Salem, NC 27110, and **Jozef H. Przytycki*** (przytyck@gwu.edu), Department of Mathematics, George Washington University, Washington, DC 20052. *The Gram determinant of the type B Temperley-Lieb algebra and the determinant of the matrix of chromatic joins.*

We solve a problem posed by Rodica Simion (1955-2000) regarding Gram determinants of the type B Temperley-Lieb algebras. We present this in a fashion influenced by the work of W.B.R.Lickorish on Witten-Reshetikhin-Turaev invariants of 3-manifolds.

THEOREM:

$$D_n^B(a,d) = \prod_{i=1}^{n} \left(T_i(d)^2 - a^2\right)^{\binom{2n}{n-i}},$$

where $T_i(d)$ is the Chebyshev polynomial of the first kind.

The formula (without multiplicity of factors) was predicted by Mietek Dąbkowski and Przytycki in March of 2002. The complete factorization of the determinant $D_n^B(a,d)$ was conjectured by Gefry Barad in 2003. Rodica Simion considered also similar (Tutte) matrices of chromatic joins. We prove that they are in fact *similar* to Gram matrices of Temperley-Lieb algebras. (Received February 05, 2008)