ON CHEBYSHEV POLYNOMIALS AND TORUS KNOTS

A.M. Gavrilik, A.M. Pavlyuk

Bogolyubov Institute for Theoretical Physics,
Nat. Acad. of Sci. of Ukraine
(*14b, Metrolohichna Str., Kyiv 03680, Ukraine;
e-mail: omgavr@bitp.kiev.ua; pavlyuk@bitp.kiev.ua*)

S u m m a r y

In this work, we demonstrate that the q-numbers and their two-parameter generalization, the q,p-numbers, can be used to obtain some polynomial invariants for torus knots and links. First, we show that the q-numbers, which are closely connected with the Chebyshev polynomials, can also be related with the Alexander polynomials for the class $T(s, 2)$ of torus knots, s being an odd integer, and used for finding the corresponding skein relation. Then, we develop this procedure in order to obtain, with the help of q, p-numbers, the generalized two-variable Alexander polynomials and to prove their direct connection with the HOMFLY polynomials and the skein relation of the latter.