

Neighboring ternary cyclotomic coefficients differ by at most one

Yves Gallot¹ and Pieter Moree²

¹*12 bis rue Perrey, 31400 Toulouse, France
e-mail: galloty@orange.fr*

²*Max-Planck-Institut für Mathematik, Vivatsgasse 7, D-53111 Bonn, Germany
e-mail: moree@mpim-bonn.mpg.de*

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Abstract. A cyclotomic polynomial $\Phi_n(x)$ is said to be ternary if $n = pqr$ with p, q and r distinct odd prime factors. Ternary cyclotomic polynomials are the simplest ones for which the behaviour of the coefficients is not completely understood. Eli Leher showed in 2007 that neighboring ternary cyclotomic coefficients differ by at most four. We show that, in fact, they differ by at most one. Consequently, the set of coefficients occurring in a ternary cyclotomic polynomial consists of consecutive integers.

As an application we reprove in a simpler way a result of Bachman from 2004 on ternary cyclotomic polynomials with an optimally large set of coefficients.

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