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Limits of geometric higher normal functions and Apéry constants

The irrationality of $\zeta(3)$ was historically proven by R. Apéry via the approximation by the ratio of two sequences of integers. For each of five Mukai Fano threefolds with Picard rank 1, V. Golyshev obtained a special value of L -function as the ratio of similar two sequences which arise from the quantum recursion. In terms of the mirror symmetry, this construction in the A-model side can be generalized to Fano threefolds with Picard rank 1. The Arithmetic Mirror Symmetry Conjecture states that a corresponding construction in the B-model side will be obtained from the limits of geometric higher normal functions. In this talk, we show that this conjecture holds for five Golyshev's examples by constructing specific higher Chow cycles. This is joint work with V. Golyshev and M. Kerr.