

Ternary Diophantine Equations via Galois Representations and Modular Forms

Michael A. Bennett and Chris M. Skinner

Abstract. In this paper, we develop techniques for solving ternary Diophantine equations of the shape $Ax^n + By^n = Cz^2$, based upon the theory of Galois representations and modular forms. We subsequently utilize these methods to completely solve such equations for various choices of the parameters A, B and C . We conclude with an application of our results to certain classical polynomial-exponential equations, such as those of Ramanujan–Nagell type.

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