Exposé court

122 *Characteristic sequences of the sets of sums of squares as columns of cellular automata*

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A classical result due to Lagrange states that any natural number can be written as a sum of four squares. Characterizations of integers that are a sum of two and three squares were established by Fermat, Euler, Legendre and Gauss. In this paper we denote by s_1, s_2 and s_3 the characteristic functions of the integers which are respectively sums of one, two and three squares. We recall the already known results about the nonautomaticity of s_1 and about the 2-automaticity of s_3 and we prove the nonautomaticity of s_2. In the second part, we recall a construction of s_1 as a column of a cellular automaton and we give a construction for s_3 as an immediate application of a result of Rowland and Yassawi about the construction of p-automatic sequences when p is a prime number. Finally we show that s_2 is also constructible as a column of a cellular automaton and we provide an explicit construction.