FIELDS

ABSTRACTS 1.2

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A coloring problem for squares

One of the earliest results in Ramsey theory due to Schur, says that if the natural numbers are finitely colored, then there is a monochromatic solution of the equation: $x+y-z=0$. This was generalized by Rado, to equations $a_1x_1+\ldots+a_sx_s=0$, for which there is a subset of the coefficients which adds up to 0. We consider an inhomogeneous version of Rado's equation, when only the squares of the natural numbers are finitely colored, that is the existence of monochromatic solutions $x_1,\ldots,x_s$ to the equation: $a_1x_1^2+\ldots+a_sx_s^2=P(x)$, for a family of integral polynomials P satisfying a natural condition. The proof is inspired by a result of Khalfalah and Szemerédi on monochromatic solutions x_1, x_2 of the equation: $x_1+x_2=x^2$.