Sedunova, Alisa

Intersections of binary quadratic forms in primes and the paucity phenomenon. (English)
J. Number Theory 235, 305-327 (2022)

Summary: The number of solutions to $a^2 + b^2 = c^2 + d^2 \leq x$ in integers is a well-known result, while if one restricts all the variables to primes Erdős [4] showed that only the diagonal solutions, namely, the ones with $\{a, b\} = \{c, d\}$ contribute to the main term, hence there is a paucity of the off-diagonal solutions. Daniel [3] considered the case of $a, c$ being prime and proved that the main term has both the diagonal and the non-diagonal contributions. Here we investigate the remaining cases, namely when only $c$ is a prime and when both $c, d$ are primes and, finally, when $b, c, d$ are primes by combining techniques of Daniel, Hooley and Plaksin.

MSC:
11N37 Asymptotic results on arithmetic functions
11N32 Primes represented by polynomials; other multiplicative structures of polynomial values
11P21 Lattice points in specified regions

Keywords:
sum of squares; quadratic forms; primes in arithmetic progressions; Diophantine equations

Full Text: DOI

References:

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically

Edited by FIZ Karlsruhe, the European Mathematical Society and the Heidelberg Academy of Sciences and Humanities
© 2022 FIZ Karlsruhe GmbH