On Products of Consecutive Terms from a Second-order Arithmetic Progression

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In Diophantine number theory, the appearance and distribution of complete powers in arithmetic progressions is an often investigated and actively researched area. According to a classic result of Euler, four square numbers cannot form an arithmetic progressions. The problem can be generalized in many ways, such as what happens when we omit terms or consider the product of k consecutive terms, see [1, 2].

We obtain another generalization of the problem if we omit terms from the progressions in a special way to obtain a second-order arithmeric progressions and consider the product of k consecutive terms.

In present talk we prove that, if $k \leq 13$, with a finite number of exceptions, the product of the first k terms of a secon-order aritmetic progressions can not be a square, if its differentials is the aritmetic progressions $1, 2, \ldots$. Further we prove a similar result for cubes as the pruct of terms of second-order aritmetic progression.

This is a joint work with Attila Bérczes, Lajos Hajdu, Márton Szikszai.

This research was supported by the *ÚNKP*, the *Kulturális és Innovációs Minisztérium* and the *Nemzeti Kutatási, Fejlesztési és Innovációs Alap*.

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