POWER VALUES OF SUMS OF CERTAIN PRODUCTS OF CONSECUTIVE INTEGERS AND RELATED RESULTS

Maciej Ulas
Jagiellonian University (Kraków, Poland)

Let n be a non-negative integer and put $p_n(x) = \prod_{i=0}^{n}(x+i)$. In the first part of the talk, for given n, we study the existence of integer solutions of the Diophantine equation

$$y^m = p_n(x) + \sum_{i=1}^{k} p_{a_i}(x),$$

where $m \in \mathbb{N}_{\geq 2}$ and $a_1 < a_2 < \ldots < a_k < n$. This equation can be seen as an additive version of the Erdős-Selfridge Diophantine equation $y^m = p_n(x)$. We present some general finiteness results concerning the integer solutions of the above equation. In particular, if $n \geq 2$ with $a_1 \geq 2$, then our equation has only finitely many solutions in integers. In the second part of the talk we present some results concerning the equation

$$y^m = \sum_{i=1}^{n} p_{a_i}(x_i),$$

for $m = 2, 3$, which can be seen as an additive version of the equation considered by Erdős and Graham.

This is joint work with Szabolcs Tengely (University of Debrecen, Hungary)