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**Title:** A consequence of the ternary Goldbach theorem

**Author(s):** Imre Kátai and Bui Minh Phong

Let

$$\mathcal{M}_k = \{p_1 + p_2 + \cdots + p_k \mid p_1, p_2, \ldots, p_k \in \P\},$$

where $\mathcal{P}$ is the set of primes. We proved that if an integer $k \geq 3$ and arithmetical functions $f$, $g$ satisfy the functional equation

$$f(p_1 + p_2 + \cdots + p_k) = g(p_1) + g(p_2) + \cdots + g(p_k)$$

for all $p_1, p_2, \ldots, p_k \in \P$, then there are two constants $A$ and $B$ such that $f(n) = An + kB$ for all $n \in \mathcal{M}_k$ and $g(p) = Ap + B$ for all $p \in \mathcal{P}$.

**Address:**
Imre Kátai
Department of Computer Algebra
Faculty of Informatics
Eötvös Loránd University
H-1117 Budapest
Pázmány Péter Sétány 1/C
Hungary

**Address:**
Bui Minh Phong
Department of Computer Algebra
Faculty of Informatics
Eötvös Loránd University
H-1117 Budapest
Pázmány Péter Sétány 1/C
Hungary