# ARF NUMERICAL SEMİGROUPS WITH PRIME POWER MULTIPLICITY

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## ABSTRACT

Let $N_{ARF}(m, \mathcal{C})$ denote the number of Arf numerical semigroups with multiplicity $m$ and conductor $\mathcal{C}$. In a previous paper (Karakaş H. İ., Arf numerical semigroups with prime multiplicity, *Semigroup Forum*, 105(2022), no. 2, 478-487, MR 4491011) we proved that $N_{ARF}(m, \mathcal{C})$ depends only on the congruence class of $\mathcal{C}$ modulo $m$ if $m$ is prime. In the same paper, we noticed the existence of composite numbers $m$ for which $N_{ARF}(m, \mathcal{C})$ depends only on the congruence class of $\mathcal{C}$ modulo $m$ for some congruence classes, and we had posed the question of characterizing such $m$ and congruence classes of $m$ for which $N_{ARF}(m, \mathcal{C})$ is an invariant of those classes.

The aim of this work is to prove that $N_{ARF}(p^n, \mathcal{C})$ is an invariant of the congruence class of $\mathcal{C} \equiv (tp^{n-1} + 1)(\text{mod } p^n)$, where $p, n, t$ are positive integers, $p$ is prime, and $t \in \{1, ..., p-1\}$.