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**Abstract** 

We study the period of the linear map \( T : \mathbb{Z}_m^n \to \mathbb{Z}_m^n \) : \((a_0, \ldots, a_{n-1}) \mapsto (a_0 + a_1, \ldots, a_{n-1} + a_0)\) as a function of \( m \) and \( n \), where \( \mathbb{Z}_m \) stands for the ring of integers modulo \( m \). Because this map is a variant of the Ducci sequence, several known results are adapted in the context of \( T \). The main theorem of this paper states that the period modulo \( m \) can be deduced from the prime factorization of \( m \) and the periods of its prime factors. We also characterize the tuples that belong to a cycle when \( m \) is prime.