

## ALMOST SELF-COMPLEMENTARY 3-UNIFORM HYPERGRAPHS

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### Abstract

It is known that self-complementary 3-uniform hypergraphs on  $n$  vertices exist if and only if  $n$  is congruent to 0, 1 or 2 modulo 4. In this paper we define an almost self-complementary 3-uniform hypergraph on  $n$  vertices and prove that it exists if and only if  $n$  is congruent to 3 modulo 4. The structure of corresponding complementing permutation is also analyzed. Further, we prove that there does not exist a regular almost self-complementary 3-uniform hypergraph on  $n$  vertices where  $n$  is congruent to 3 modulo 4, and it is proved that there exist a quasi regular almost self-complementary 3-uniform hypergraph on  $n$  vertices where  $n$  is congruent to 3 modulo 4.

**Keywords:** uniform hypergraph, self-complementary hypergraph, almost complete 3-uniform hypergraph, almost self-complementary hypergraph, quasi regular hypergraph.

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