ALMOST SELF-COMPLEMENTARY HYPERGRAPHS

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A k-hypergraph \( H \) is self-complementary if it is isomorphic with its complement. It is proved in [4] that a k-hypergraph of order \( n \) exists if and only if \( \binom{n}{k} \) is even.

We call a k-uniform hypergraph \( H = (V; E) \) almost self-complementary if it is isomorphic with \( H' = (V; \binom{V}{k} - E - \{e_0\}) \) where \( e_0 \) is an element of the set \( \binom{V}{k} - E \). Almost self-complementary k-hypergraphs of order \( n \) may be also called self-complementary in \( K_n^{(k)} - e_0 \). Almost self-complementary 2-hypergraphs were first considered in [1] and called almost self complementary graphs or else graphs self-complementary in \( K_n - e \), almost self complementary 3-hypergraphs are considered in [2].

We apply a celebrated theorem of Kummer [3] to prove that an almost self-complementary k-hypergraph of order \( n \) exists whenever \( \binom{n}{k} \) is odd.

**Keywords:** hypergraph, uniform hypergraph, self-complementary hypergraph.

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References


