Abstract

A dexagon triple is a configuration consisting of 6 triangles whose “inside edges” form a copy of $K_4$. A dexagon triple system is a pair $(X, D)$, where $D$ is a collection of edge disjoint hexagons which partitions $3K_n$ (= every pair of vertices are joined by 3 edges). If the inside copies of $K_4$ form a block design ($\lambda = 1$), the dexagon triple system is said to be perfect. We show that a necessary and sufficient condition of the existence of a perfect dexagon triple system is $n \equiv 1 \pmod{12}$. 