

# Some Results on the Existence of $P_3$ -Factors in Regular Graphs

Sanaz Rabinia

Sharif University of Technology

s.rabinia@gmail.com

(joint work with Saieed Akbari, Nastaran Haghparast and Morteza Hasanvand)

In 1985, Akiyama and Kano conjectured that every 3-connected cubic graph of order divisible by 3 has a  $P_3$ -factor. In this paper we conjecture that the aforementioned conjecture also holds for 3-connected 4-regular graphs. We show that the later conjecture implies the first one. In 2007 an infinite family of 2-connected cubic planar bipartite graphs of order divisible by 3 with no  $P_3$ -factor was constructed. In this paper, we present a simple construction for this result.

MSC2000: 05C07, 05C40, 05C70.

Keywords: Cubic graph, 3-connected,  $P_3$ -factor.