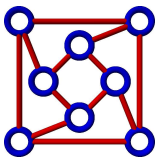

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DESCRIBING 3-PATHS IN PLANE GRAPHS OF GIVEN GIRTH

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The *girth* of a graph is the length of a shortest cycle in the graph. A path on three vertices u, v, and w is an (i, j, k)-*path* if $deg(u) \leq i, deg(v) \leq j$, and $deg(w) \leq k$.

The motivation for our research has come from the following results. Already in 1922 Franklin proved that every normal plane map G of minimum degree five contains a $(6, 5, 6)$-path. In 1993 Ando, Iwasaki and Kaneko showed that every 3-polytope contains a 3-path such that the sum of degrees of vertices of this path is at most 21. Jendroľ extended this result and described the types of 3-paths contained in each 3-polytope. In 2013 Borodin described the 3-paths in normal plane maps without two adjacent 3-vertices lying in two common 3-faces.

In this talk we consider simple plane graphs with minimum degree at least two and girth at least five. We describe the structure of the 3-paths in such graphs.