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*The extremal functions for triangle-free graphs with excluded minors*

Linklessly embeddable graphs are 3-dimensional analogues of planar graphs which include apex planar graphs. While there is no known analogue of Euler's formula for linkless embeddings, a tight bound of  $4n - 10$  on the number of edges in linklessly embeddable graphs can be obtained from their excluded minor characterization and a theorem of Mader on the extremal functions for graphs with no  $K_p$  minor for small  $p$ . We prove an analogue of Mader's theorem for triangle-free graphs, and also show that apex planar graphs satisfy the edge bound of  $3n - 9 + \frac{t}{3}$ , where  $t$  is the number of triangles. This bound is conjectured to hold for all linklessly embeddable graphs. Joint work with Robin Thomas.