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**Roman Nedela** and **Martin Skoviera\*** ([skoviera@dcs.fmph.uniba.sk](mailto:skoviera@dcs.fmph.uniba.sk)), Department of Computer Science, Comenius University, Bratislava, 842 48. *Amply upper embeddable graphs*. Preliminary report.

A connected graph  $G$  is upper embeddable if it has a 2-cell embedding into an orientable surface of genus  $\lfloor \beta/2 \rfloor$  where  $\beta$  is the Betti number (cycle rank) of  $G$ ; it is amply upper embeddable, if there is a pair of adjacent vertices in  $G$  whose removal leaves an upper embeddable graph. Amply upper embeddable graphs have been introduced by the authors as a tool for the construction of Hamilton cycles and paths in embedded cubic graphs (in particular cubic vertex-transitive graphs) via surface duality. We explain the basic idea of the method and prove that every cyclically 5-connected cubic graph is amply upper embeddable. We conjecture that the same is true also for cyclically 4-connected cubic graphs. (Received September 26, 2017)