

**The origin of CDC conjecture**  
**- History of references**  
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**Circuit double cover conjecture:**

(Tutte  $\leq 70$ 's, Szekeres 1973, Itai and Rodeh 1978, Seymour 1979)

*Every bridgeless graph has a family of circuits that covers every edge precisely twice.*

**Itai and Rodeh, Covering a graph by circuits, Lecture Notes in Computer Science 62 (1978)**

The following problems remain open:

(ii) Does every graph have a circuit cover in which each edge is covered at most twice?

**Jaeger (1985, SURVEY)**

It seems difficult to attribute the paternity of this conjecture. The question is raised in particular in [Seymour] and [Szekeres].

**Goddyn (1985, Girth)**

Early references to this problem appear in [Seymour] and [Szekeres] but its origin is uncertain.

**Alspach, Zhang (1993 Discrete Math.)**

No reference

**Alspach, Goddyn, Zhang (1994 AMS Transaction)**

This conjecture has been the subject of numerous papers [Bondy, Catlin, Goddyn, Goddyn, Jaeger, Seymour, Szekeres, Tarsi],

**Jackson (1993 London Math. S.)**

Conjecture 2.7 in the survey paper by Jackson – No reference.



### **Goddyn (1988 PhD Dissertation)**

The conjecture was stated explicitly in 1979 by Seymour. In 1973 Szekeres conjectured that every bridgeless cubic graph has a circuit double cover. The statement of his conjecture contains a slight error. Szekeres' conjecture is actually equivalent to the circuit double cover conjecture since it suffices to prove the circuit double cover conjecture for (matroids of) cubic graphs only.

**Bondy and Murty (2008 Graph Theory)**

Open Problem #10.

Folklore

(Robertson (2007)); Szekeres (1973); Seymour (1979b).

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Professor Herbert Fleischner  
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Dear Professor Fleischner:

Thank you for your letter about the cycle double cover conjecture. I too have been puzzled to find an original reference. I think the conjecture is one that was well established in mathematical conversation long before anyone thought of publishing it.

I don't remember referring to the conjecture in my own writings. The nearest I came was to show that bicubic graphs, and other cubic graphs with Tait colourings had circuit-double-colours<sup>vers</sup> "On the imbedding of linear graphs in surfaces", Proc. London Math. Soc. Ser. 2, Vol. 51 (1948).

All good wishes,

Bill Tutte

WTT/js

W.T. Tutte