1065-05-140 **Cun-Quan Zhang*** (cqzhang@math.wvu.edu), Department of Mathematics, West Virginia University, Morgantown, WV 26506-6310. *On cycle double cover conjecture.* Preliminary report.

The Cycle Double Cover Conjecture (CDC Conjecture) was proposed independently by G. Szekeres (1973), A. Itai and M. Rodeh (1978), and P.D. Seymour (1979). The conjecture is easy to state: *For every 2-connected graph, there is a family $\mathcal{F}$ of circuits such that every edge of the graph is covered by precisely two members of $\mathcal{F}$.* As an example, if a 2-connected graph is properly embedded in a surface (without crossing edges) in such a way that all faces are bounded by circuits, then the collection of the boundary circuits will "double cover" the graph. The CDC conjecture (and its numerous variants) is considered by most graph theorists to be one of the major open problems in the area. This survey will present some progresses during last 30 years to this open problem. The conjecture has been verified for many families of graphs, most of them are 3-edge-colorable, or "almost" 3-edge-colorable. In this talk, we will discuss some promising techniques, with which we are able to reach families of graphs that are beyond "almost" 3-edge-colorability (for example, weight decomposition, circuit extension, circuit chain, and their hybrid versions, etc.) (Received September 10, 2010)