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Sebastian M Cioaba* (cioaba@math.udel.edu), University of Delaware, Department of Mathematical Sciences, Ewing Hall, Newark, DE 19716. *Disconnecting strongly regular graphs.*

A (v, k, λ, μ) -strongly regular graph is a k -regular graph such that any two adjacent vertices have exactly λ common neighbors and any two distinct non-adjacent vertices have exactly μ common neighbors. Strongly regular graphs are interesting mathematical objects with connections to combinatorics, algebra, geometry, coding theory and computer science among others.

In 1985, Brouwer and Mesner proved that the vertex-connectivity of any connected strongly regular graph equals its degree and the only disconnecting sets of minimum size are the neighborhoods of the vertices of the graph.

In 1996, Brouwer conjectured that the minimum size of a disconnecting set of vertices in a (v, k, λ, μ) -strongly regular graph whose removal yields only non-singleton components, is $2k - \lambda - 2$ (which is the size of the neighborhood of any edge).

In this talk, I will show Brouwer's Conjecture is false in general by presenting some infinite families of counterexamples arising from copolar and Δ -spaces. I will show Brouwer's Conjecture is true for many families of graphs including conference graphs, lattice graphs and Latin square graphs.

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