1057-05-78 **Dillon Mayhew*** (dillon.mayhew@msor.vuw.ac.nz), Wellington, New Zealand, **Geoff Whittle**, Wellington, New Zealand, and **Stefan van Zwam**, Waterloo, Canada. *Obstacles to matroid decomposition theorems.*

A decade ago, Whittle introduced some fundamental classes of ternary matroids, including those of near-regular and sixth-root-of-unity matroids. Whereas a matroid is regular if and only if it is representable over GF(2) and GF(3), a matroid is near-regular if and only if it is representable over GF(3), GF(4), and GF(5), and is sixth-root-of-unity if and only if it is representable over GF(3) and GF(4).

Seymour's decomposition theorem splits every regular matroid into components that are graphic, cographic, or isomorphic to R_{10}, using 1-, 2-, and 3-sums. One would hope that similar results might hold for Whittle's classes. Indeed, it was conjectured that near-regular matroids can be decomposed into components that are signed-graphic, co-signed-graphic, or isomorphic to one of a finite number of sporadic matroids, using 1-, 2-, and 3-sums. It was also though that every 3-connected matroid that is sixth-root-of-unity without being near-regular can be decomposed into regular components and a copy of $\mathrm{AG}(2,3)\backslash e$, using 3-sums.

In this rather upsetting talk, we show that these beliefs are false, and point the way to some results that may be somewhat more true. (Received January 07, 2010)