Open problems about infinite matroids - day II

2.1 Does Seymour's decomposition theorem for regular matroids extend to tame matroids? In other words: Does every infinite regular matroid have a tree-decomposition over 3-sums all of whose torsos are graphic, cographic, R_{10} or R_{12}?

Motivation: Seymour's Decomposition Theorem is a central theorem of finite matroid theory and weaker decomposition theorems have been proved.

2.2 Let G be the graph depicted in Figure 1. What are the (not necessarily tame) matroids whose finite circuits are the edge sets of finite cycles of G and whose finite cocircuits are the finite bonds of G?

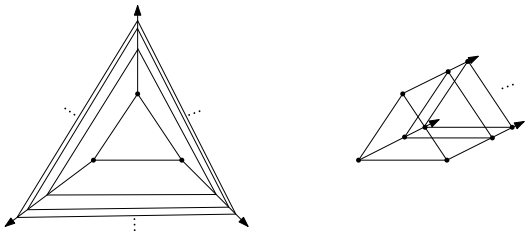

Figure 1: Two drawings of the graph G.

What about this question for matroids in general (with a given ray-shaped decomposition of 3-separations)?

Motivation: G seems to be the simplest graph for which we do not know the answer.

2.3 Is the existence of a uniform matroid with an infinite base and an infinite cobase independent of ZFC?

Motivation: Uniform matroids should be understood very well.

2.4 Is there a uniform matroid whose union with every finitary matroid is a matroid?

Motivation: If true, this would give a counterexample for question 1.3.

2.5 Does every tame matroid have a finite order separation with two infinite sides?

Motivation: Fundamental question about the structure of infinite matroids, and related to a question of day V.