Open problems about infinite matroids - day V

5.1. Does the intersection conjecture hold for pairs of finitary graphic matroids? Motivation: Very close the the Aharoni-Berger theorem.

5.2 Does the covering conjecture hold for arbitrary families of finitary matroids? Motivation: it holds for finite families, and for arbitrary families on a countable ground set.

5.3. Let (T, M) and (T, N) be trees of binary matroids such that for any vertex t of T the matroids $M(t)$ and $N(t)$ have the same ground set $E(t)$ and for any edge tu of T the intersection $E(t) \cap E(u)$ has at most 2 elements. Let Ψ_1 and Ψ_2 be Borel sets of ends of T. Does the intersection conjecture hold for $M_{\Psi_1}(T, M)$ and $M_{\Psi_2}(T, N)$? Motivation: it holds when each of the overlap sets $E(t) \cap E(u)$ has size at most 1.

5.4. Let M be a tame matroid, C an circuit and D a cocircuit of M. Must there then exist a partition (P, Q) of the ground set with $\kappa_M(P)$ finite and both of the sets $C \setminus P$ and $D \setminus Q$ finite? Motivation: special cases of this follow from intersection.

5.5 Let M be a tame matroid and let P and Q be disjoint subsets of the ground set E of M, with $\kappa_M(P, Q) = k$. Does there exist a partition (I, J) of $E \setminus (P \cup Q)$ such that $\kappa_{M/I \setminus J}(P) = k$? Motivation: true when M is finitary, follows from intersection.