▸ MICHAEL LIEBERMAN, JIŘÍ ROSICKÝ, SEBASTIEN VASEY, *Weak factorization systems and stable independence*.
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We discuss recent joint work with Rosický and Vasey, [1], which reveals surprising connections between model-theoretic independence notions and the behavior of *weak factorization systems*, which play an important role in the analysis of model categories and in homological algebra. In essence, given a reasonable category $\mathcal{K}$ and family of maps $\mathcal{M}$, the category $\mathcal{K}_{\mathcal{M}}$ obtained by restricting to the morphisms in $\mathcal{M}$ has a stable independence notion just in case $\mathcal{M}$ forms the left half of a *cofibrantly generated* weak factorization system, i.e. one generated by pushouts and transfinite compositions from a set—rather than a class—of basic maps. We sketch the argument, recalling the category-theoretic generalization of stable nonforking independence from [1], as well as the necessary terminology involving weak factorization systems.

As a particular example, we specialize to the case $\mathcal{K} = R$-Mod and $\mathcal{M}$ a class of homomorphisms with kernels in a fixed subcategory: this generalizes the (abstract elementary) classes of modules ${}^{\perp}N$ considered by Baldwin-Eklof-Trlifaj, [3], and answers a number of questions from their paper. In particular, we prove that this class is tame and stable whenever it is an AEC.

[1] Michael Lieberman, Jiří Rosický, Sebastien Vasey, *Weak factorization systems and stable independence*, ***arXiv:1904.05691v2***, submitted.

[2] Michael Lieberman, Jiří Rosický, Sebastien Vasey, *Forking independence from the categorical point of view*, ***Advances in Mathematics***, vol. 346 (2019), pp. 719–772.

[3] John Baldwin, Paul Eklof, Jan Trlifaj, *${}^{\perp}N$ as an abstract elementary class*, ***Annals of Pure and Applied Logic***, vol. 149 (2007), no. 1–3, pp. 25–39.