Topologically Defined Independence Relations

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In algebraically closed fields, independence can be defined via the Zariski topology: $\bar{a}$ is independent from B over C iff the locus of $\bar{a}$ over $B \cup C$ is a union of irreducible components of the locus of $\bar{a}$ over C. This definition can be generalised to locally noetherian topologies with a basis of definable sets, where "locally" means that uniformly defined closed sets satisfy the descending chain condition.

In a large class of theories there are natural topologies such that this "topological independence" is indeed an independence relation in the sense of [KP]. In stable theories, this has then to be non-forking, and no stable theory is presently known not to have such a topologically determined forking.

[JK] M. Junker, I. Kraus, Theories with equational forking, march 2000, submitted to the JSL.

[KP] B. Kim, A. Pillay, Simple Theories, Annals of Pure and Applied Logic **88** (1997), No. 2-3, pp. 149–164.

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