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Existential closedness of \mathbb{Q}^{alg} as a globally valued field

I will talk about an application of the differentiability of the arithmetic volume function and an arithmetic Bertini type theorem to classify when one can find a closed point on the generic fiber of an arithmetic variety, whose heights with respect to some finite tuple of arithmetic R-divisors approximate a given tuple of real numbers.

This result is used to prove existential closedness of \mathbb{Q}^{alg} as a globally valued field (abbreviated GVF) - it is an arithmetic analogue of the function field case published recently by Ita Ben Yaacov and Ehud Hrushovski.