Exposé court

61   *Random Diophantine equations in the primes*

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Given a homogeneous polynomial equation, one expects that if there is a non-trivial solution in the real numbers and in every p-adic field, then there is a solution in the integers. This is called the Hasse principle, and while it does not always hold, it does hold in many cases. In this talk, we discuss the solubility of certain equations in the primes. We develop a so-called prime Hasse principle and prove that it holds for almost all equations of a certain type, based on some work of Brüdern and Dietmann on the Hasse principle. Time-permitting, we will explain some further results on prime solubility, including some explicit counterexamples to the prime Hasse principle.