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*The number of directions determined by a Cartesian product in finite fields*

The directions determined by a subset  $U \subset \mathbb{F}_p^2$  is the set of slopes formed by pairs of points from  $U$ . Seminal results of Rédei and Szőnyi show that  $U$  determines at least  $(|U| + 3)/2$  directions. In the case when  $U = A \times B$ , a Cartesian product, we improve the multiplicative constant and show that at least  $|A||B| - |A| + 2$  directions are determined. When  $A = B$  is an arithmetic progression, we further improve the multiplicative constant and give a precise asymptotic formula for the number of directions. Joint work with Daniel Di Benedetto, Greg Martin, Jozsef Solymosi, and Chi Hoi Yip.