1145-13-2142 **Amal Mattoo*** (amattoo@college.harvard.edu), 6809 Persimmon Tree Rd., Bethesda, MD 20817, and **Jiyang Gao**, **Yutong Li** and **Michael C. Loper**. *Virtual Complete Intersections in* $\mathbb{P}^1 \times \mathbb{P}^1$.

We study homological invariants of a finite set of points in $\mathbb{P}_1 \times \mathbb{P}_1$. We give examples where the size of a minimal free resolution for the vanishing ideal of the points depends on interactions between the cross ratios of the points in each copy of $\mathbb{P}_1$. We then examine virtual resolutions in the sense of Berkesch, Erman and Smith, which for points in $\mathbb{P}_1 \times \mathbb{P}_1$ are complexes that resolve the vanishing ideal only up to saturation by the irrelevant ideal. We show that virtual resolutions, though not a combinatorial invariant, nevertheless convey more condensed geometric structure. We show that set-theoretically every finite set of points forms a complete intersection, meaning that there is an ideal whose vanishing set is exactly the set of points and the ideal admits a virtual resolution taking the form of a Koszul complex. In the richer case of reduced points, we use tools including Generalized Bézout's Theorem, degree analysis, and number-theoretic techniques, to give various sufficient conditions and necessary conditions for a virtual complete intersection. In particular, we completely classify the case where the points form a Ferrers diagram on a ruling of $\mathbb{P}_1 \times \mathbb{P}_1$. (Received September 24, 2018)