

The fibering genus of Fano hypersurfaces

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Abstract

The "fibering genus" of X is the minimal genus of a rational fibration on X by curves. The fibering genus of a variety has been studied in work of Konno, Ein–Lazarsfeld, and Voisin in the non-Fano range. However, this measure of irrationality, unlike covering gonality or covering genus, can be interesting even for rationally-connected varieties. We prove lower bounds on the fibering genus of very general Fano hypersurfaces. In particular, we exhibit Fano varieties with arbitrarily large fibering genus. As an application, we rule out Mori fiber space structures of low relative dimension on very general Fano hypersurfaces giving a weak analog of "birational superrigidity" in higher index. The method follows Kollár's technique of degeneration to p -cyclic covers in characteristic p . The main difficulty is to ensure the degenerated fibration in curves over characteristic p is generically smooth for which a crucial input is Tate's genus change formula.