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Families of canonically polarized manifolds over log Fano varieties

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Let (X,D) be a dlt pair, where X is a normal projective variety. Let S denote the support of the rounddown of D, and K the canonical divisor of X. We show that any smooth family of canonically polarized varieties over X\S is isotrivial if the divisor -(K+D) is ample. This result extends results of Viehweg-Zuo and Kebekus-Kovacs.

To prove this result we show that any extremal ray of the moving cone is generated by a family of curves, and these curves are contracted after a certain run of the minimal model program. In the log Fano case, this generalizes a theorem by Araujo from the klt to the dlt case.

In order to run the minimal model program, we have to switch to a Q-factorialization of X. As Q-factorializations are generally not unique, we use flops to pass from one Q-factorialization to another, proving the existence of a Q-factorialization suitable for our purposes.

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