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The F-different and a canonical bundle formula

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Abstract. We study the structure of Frobenius splittings (and generalizations thereof) induced on compatible subvarieties $W \subseteq X$. In particular, if the compatible splitting comes from a compatible splitting of a divisor on some birational model $E \subseteq X' \to X$ (*i.e.*, W is a log canonical center), then we show that the divisor corresponding to the splitting on W is bounded below by the divisorial part of the different as studied by Ambro, Kawamata, Kollár, Shokurov, and others. We also show that difference between the divisor associated to the splitting and the divisorial part of the different is largely governed by the (non-)Frobenius splitting of fibers of $E \to W$. In doing this analysis, we recover an F-canonical bundle formula by reinterpreting techniques common in the theory of Frobenius splittings.

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