

# Ideals in positive characteristic and fractional ideals in characteristic 0

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This talk is about a singularity defined over a field of positive characteristic. Singularities of a variety defined over a field of characteristic 0 are quite well studied by making use of resolutions of singularities, Kodaira Vanishing Theorem, generic smoothness and so on. However in positive characteristic, these good tools are not available. So we cannot expect the equivalent results with the same method. In my talk I will propose another way to prove the equivalent results which are known in characteristic 0. It is to construct a bridge between positive characteristic and characteristic 0 by means of inversion of modulo  $p$ -reduction and discussion of arc spaces. I will show my recent results about an important invariant “minimal log discrepancy” (mld for short) by our bridge, namely for every “ $\mathbb{R}$ -ideal” on a smooth variety over the base field of positive characteristic, there exists a “ $\mathbb{R}$ -fractional ideal” on a smooth variety over characteristic 0 with the same mld. By this bridge, we also obtain some results on mld for positive characteristic from these for characteristic 0.