# Cossart's strategies for resolution in dimension three.

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Cossart's resolution of singularities for purely inseparable coverings of a regular threefold (of characteristic $p > 0$) was extended in [CP] to prove resolution for algebraic threefolds defined over any function field $k(\lambda_1, \ldots, \lambda_s)$, with $k_0$ a perfect field. The proof brings together:

1) Ramification theoretic methods extending works of Abhyankar for surfaces to reduce resolution to local uniformization for Artin–Schreier or purely inseparable coverings of degree $p$ of a regular threefold.

2) Global resolution methods for resolving such coverings, based on characteristic polyhedra and differential invariants.

I will explain the structure and main ingredients in the proof of 2), with a view to mixed characteristic (joint work with V. Cossart, in preparation).

[C] Cossart V., "Sur le polyèdre caractéristique", Thèse d'état, Orsay (1987).

[CP] Cossart, V. and Piltant, O., "Resolution of singularities of threefolds in positive characteristic. I, II.", *J. Algebra* **320** (2008), no. 3, 1051–1082 and *ibid.* **321** (2009), no. 7, 1836–1976.