1030-14-149 **Kenji Matsuki*** (kmatsuki@math.purdue.edu), Department of Mathematics, Purdue University, 150 N. University Street, West Lafayette, IN 47907-2067. *The Kawanoue program: an approach toward resolution of singularities in positive characteristic.* Preliminary report.

In recent years, after the original existential proof by Hironaka, resolution of singularities in characteristic zero has been developed into a constructive algorithm by Bierstone-Milman, Villamayor, among others, and simplified substantially by Włodarczyk. The main inductive structure is well-understood through the key notion of "a nonsingular hypersurface of maximal contact". Despite the remarkable new results by Cutkosky and Cossart-Piltant in lower dimensions, using the valuation theory and extending the methods of Abhyankar, however, in positive characteristic resolution of singularities in higher dimensions remain largely open due to the lack of a nonsingular hypersurface of maximal contact and hence of an inductive structure. H. Kawanoue, in Part I of our series of papers, announced a program toward a constructive algorithm for resolution of singularities in positive characteristic, in the framework of "an idealistic filtration" where we use the notion of "a leading generator system" as a collective substitute for the notion of a nonsingular hypersurface of maximal contact and where we find a new form of an inductive structure. The talk will explain the outline of the Kawanoue program and report on the current status of our joint work toward its completion. (Received July 30, 2007)