Resultant and conductor for self maps of the projective line

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We will study self maps with preassigned bad reduction over number fields or functions fields. We will explain a finiteness result of T.Tucker and myself in the Shafarevich-Faltings style.We will explain our results with M.Tepper and P.Williams on self maps of degree 2 for the sphere : GIT semi stability in the space of maps of a given degree implies minimality for the discriminant. We will deduce from this theorem a counterexample to a first try to compare minimal resultant to conductor. We will show that the counterexample disappears when the comparison is made to the "critical conductor" introduced by T.Tucker and myself in the finiteness theorem above. During the talk constant reference to Lattes maps will be guiding in particular we will note that an elliptic curve with multiplicative reduction (i.e a GIT semi-stable in the space of equations of elliptic curve) never has a semi stable Lattes map associated(in the pace of degree 4 maps).