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A property of an ample linear system on a non-singular variety

By

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We shall treat here the same subject as is stated in the preceding paper[1] using the dual map into the Grassmann variety. The contents of this paper are almost as the same as the contents of § 3 of my paper " On the characteristic linear systems of algebraic families " (will appear in Illinois' Journal), but I would like to present here again as a memory of Prof. Zariski following the advice of Prof. Akizuki. Before to state the complete form of the final result we must introduce some auxiliary notions.

Let V^r be an irreducible variety and E be an ample linear system of divisors on V without fixed component. Then E defines an everywhere biregular birational transformation of V onto a projective variety V_E. Let $n = \dim E$, and k a common field of definition for V and E. Then the variety V_E is defined over k, and belongs to a projective space L^n (i. e. not contained in any hyperplane of L). Let P, $\bar{P}$ be the corresponding generic points of V, V_E over k and $T_{\bar{P}}$ the tangent linear variety to V_E at $\bar{P}$. Then the Plücker coordinates $c(T_{\bar{P}})$ is rational over $k(P)$, and the point $c(T_{\bar{P}})$ has a locus $V_E{}^*$ over k. We shall call this variety *the dual variety of* V *with respect to the linear system* E, and the map φ_E of V onto $V_E{}^*$ defined over k by $\varphi_E(P) = c(T_{\bar{P}})$ will be called the *dual map* of V onto V_E^*. The map φ_E is defined at every simple point of V.

Now our theorem is as follows.

Theorem 1. *Let E be an ample linear system on a non-singular variety V defined over k and assume that the dual map φ_E of V*

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1) Y. Akizuki and H. Matsumura, On the dimensions of algebraic system of curves with nodes on a surface, in the same number of this Memoirs.