

Beltrametti, Mauro; Sommese, Andrew John**On the relative adjunction mapping.** (English) Zbl 0717.14003

Math. Scand. 65, No. 2, 189-205 (1989).

Let $\phi : X \rightarrow Y$ be a proper algebraic map with connected fibres from a connected quasi-projective n -dimensional complex manifold X , $n \geq 2$, onto a quasi-projective variety Y and let L be an algebraic line bundle on X , which is very ample relatively to ϕ . The authors use Reider's technique [*I. Reider*, Ann. Math., II. Ser. 127, No.2, 309-316 (1988; [Zbl 0663.14010](#))] in a local setting to provide results about the adjoint bundle $K_X \otimes L^{n-1}$, which generalize those obtained by *A. J. Sommese* and *A. Van de Ven* [Math. Ann. 278, 593-603 (1987; [Zbl 0655.14001](#))] in the absolute case, i.e. when Y is a point. The authors prove that, unless ϕ exhibits (X, L) as a scroll over a smooth curve, the natural morphism $\phi^* \phi_* (K_X \otimes L^{n-1}) \rightarrow K_X \otimes L^{n-1}$ is onto. This allows them to construct a normal quasi-projective space X' and algebraic morphisms with connected fibres $\Phi : X \rightarrow X'$, $\phi' : X' \rightarrow Y$ such that $\phi = \phi' \circ \Phi$ and $K_X \otimes L^{n-1} = \Phi^* \mathcal{L}$, where \mathcal{L} is a line bundle on X' , which is ample and spanned relatively to ϕ' . If $\dim(X') < \dim(X)$ then there is a precise description of ϕ , while if $\dim(X') = \dim(X)$ then Φ defines a sort of relative reduction (X', L') of (X, L) , up to which, the authors prove that $K_X \otimes L^{n-1}$ is very ample relatively to ϕ .

Reviewer: [A.Lanteri](#)**MSC:****14C20** Divisors, linear systems, invertible sheaves**14F05** Sheaves, derived categories of sheaves, etc. (MSC2010)**Keywords:**adjunction; k -spannedness; algebraic line bundle; adjoint bundle**Full Text:** [DOI](#) [EuDML](#)