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Title:	On prolongations of valuations to the composite field
Authors:	Jakhar, A. (/jspui/browse?type=author&value=Jakhar%2C+A.) Khanduja, S.K. (/jspui/browse?type=author&value=Khanduja%2C+S.K.) Sangwan, N. (/jspui/browse?type=author&value=Sangwan%2C+N.)
Keywords:	Valued fields Valuations Prime ideals in the ring of algebraic Integers
Issue Date:	2020
Publisher:	Elsevier
Citation:	Journal of Pure and Applied Algebra 224(2), pp. 551-558
Abstract:	Let v be a Krull valuation of a field K with valuation ring R_v and K_1, K_2 be finite separable extensions of K which are linearly disjoint over K . Assume that the integral closure of R_v in the composite field K_1K_2 is a free R_v -module. For a given pair of prolongations v_1, v_2 of v to K_1, K_2 respectively, it is shown that there exists a unique prolongation w of v to K_1K_2 which extends both v_1, v_2 . Moreover with Sias the integral closure of R_v in K_i , if the ring S_1S_2 is integrally closed and the residue field of v is perfect, then $f(w/v) = f(v_1/v)f(v_2/v)$, where $f(v'/v)$ stands for the degree of the residue field of a prolongation v' of v over the residue field of v . As an application, it is deduced that if K_1, K_2 are algebraic number fields which are linearly disjoint over $K = K_1 \cap K_2$, then the number of prime ideals of the ring AK_1K_2 of algebraic integers of K_1K_2 lying over a given prime ideal \mathfrak{p} of A equals the product of the numbers of prime ideals of AK_i lying over \mathfrak{p} for $i = 1, 2$.
URI:	https://www.sciencedirect.com/science/article/pii/S0022404919301392?via%3Dihub (https://www.sciencedirect.com/science/article/pii/S0022404919301392?via%3Dihub) http://hdl.handle.net/123456789/3415 (http://hdl.handle.net/123456789/3415)
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