VALUATIONS ON POWER SERIES RINGS IN AN ARBITRARY SET OF INDETERMINATES

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Abstract. Let V be rank one valuation domain with maximal ideal M, v be the valuation associated with V, and X be an indeterminate over V. For a power series $f=\sum_{i=0}^{\infty} a_i X^i$ in $V[[X]]$, define $v^*(f)=\inf\ \{v(a_i)\mid i=0,1,2,\ldots\}$. Then v^* is a valuation on $V[[X]]$. Moreover, $MV[[X]]$ is a prime ideal of $V[[X]]$ and $(V[[X]])_{MV[[X]]}$ is the valuation domain associated with v^*. These results were proved by Arnold and Brewer in 1973. In this talk, we generalize the results to the three types of power series rings $V[[\chi]]_i, i=1,2,3$ in an arbitrary set of indeterminates $\chi=\{X_\lambda\}_{\lambda\in\Lambda}$ over V.

References

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