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 $v^*(f) = \inf \{ v(a_i) | i = 0, 1, 2, \ldots \}$. 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 $V[[\lambda X]]$, $i = 1, 2, 3$ in an arbitrary set of indeterminates $\chi = \{ X_\lambda \}_{\lambda \in \Lambda}$ over $V$.

References

