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Prüfer $\star$-multiplication domains and semistar operations. (English. English summary)

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Let D be an integral domain with quotient field K. A semistar operation $\star$ on D is basically a star operation on D that need not satisfy $D^\star = D$, i.e, $\star$ is a closure operation on the set $\overline{F}(D)$ of D-submodules of K (instead of being on the set $F(D)$ of nonzero fractional ideals as is the case for star operations) that satisfies $(xE)^\star = xE^\star$ for each $0 \neq x \in K$ and $E \in \overline{F}(D)$. The domain D is called a Prüfer $\star$-multiplication domain (P$\star$MD) if every nonzero finitely generated ideal of D is $\star_f$-invertible, i.e., there is a finitely generated fractional ideal $J \subseteq I^{-1}$ of D with $(IJ)^\star = D$. This paper studies P$\star$MD's D and their associated Nagata rings $D[X]_{N(\star)}$ (where $N(\star) = \{f \in D[X] |\ c(f)^\star = D\}$, $c(f)$ is the content of f) and Kronecker function rings ($\{f/g |\ 0 \neq f, g \in D[X]$ with $c(fh)^\star \subseteq c(gh)^\star$ for some $0 \neq h \in D[X]\} \cup \{0\}$).

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