

# Appendix: Errata Volume I

- p. 25, line +10:  
“of  $\Gamma$ ” instead of “of  $v$ ”
- p. 48, line +14:  
“ $R$ -overring of  $A$ ” instead of “overring  $B$  of  $R$ ”
- p. 60, line +6:  
“semireal” instead of “real”
- p. 64, line +10:  
“ $F(0) = 0$  and  $\deg(F) \geq 2$ ” instead of “ $y \in R$ ”
- p. 64, line +14:  
better “ $v_i(G(F(x))) \leq 2v_i(x)$ ” instead of “ $v_i(G(F(x))) < v_i(x)$ ”
- p. 92, line –1:  
“submodule of  $R$  with  $A \subset L$ ” instead of “submodule of  $R$ ”
- p. 93, line +4:  
“ $y \in A$ ” instead of “ $y \in R$ ”
- p. 140, line +13:  
“implications” instead of “implication”
- p. 148, line +2:  
“ $I_{-\gamma}$ ” instead of “ $I_\gamma$ ”
- p. 149, line –9:  
“ $R$ -regular” instead of “regular”
- p. 149, line –8:  
Delete the equation “ $1 = \sum f_i g_i$ ”
- p. 152, Proposition 10.16:  
“If  $A \subset R$  is a Bezout extension” instead of “If  $A$  is a Bezout extension”
- p. 165, Definition 3, line +3:  
The meaning of the symbol  $\Omega(R/A)$  in II, §11 deviates from the meaning in the rest of the book, since here only valuations with value group  $\mathbb{Z}$  are under consideration.
- p. 178, end of Summary:  
Everywhere “§10, §11” instead of “§9, §10”

- p. 187, end of proof of Theorem 3.3:  
Add the sentence “*Now Proposition I.5.1 tells us that  $A \subset R$  is PM.*”
- p. 206, line +9:  
“ $x' \in B$ ” instead of “ $x' \in \mathfrak{p}$ ”
- p. 267, Symbol Index,  $\mathcal{Q}(R/A)$ :  
Refer to p. 180 instead of p. 163.

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# Symbol Index

$R^*$	the group of all units of $R$ , Vol. I 2
$\Gamma_v$	the value group of $v$ , Vol. I 11
$\text{supp } (v)$	the support of a valuation $v$ , Vol. I 11
$\hat{v}$	the valuation on the quotient field $k(\text{supp } v)$ of $R/\text{supp } v$ induced by $v$ , Vol. I 11
$\mathfrak{o}_v$	the valuation ring of $\hat{v}$ , Vol. I. 11
$A_v$	the valuation ring of $v$ , Vol. I 11
$\mathfrak{p}_v$	the center of $v$ , Vol. I 11
$c_v(\Gamma)$	the characteristic subgroup of $\Gamma$ with respect to $v : R \rightarrow \Gamma \cup \{\infty\}$ , Vol. I 11
$v _H$	the valuation induced by a convex subgroup of $\Gamma$ , Vol. I 11
$v_S$	the extension of $v$ to $S^{-1}R$ , Vol. I 13
$\tilde{v}$	the localization of $v$ , Vol. I 14
$v/H, \mathfrak{p}_H, A_H$	the coarsening of $v$ , Vol. I 17; 63
$M_{[S]}$	the saturation of $M$ in $R$ by $S$ , Vol. I 18
$v _B$	the special restriction of $V$ to $B$ , Vol. I 19
$(A_{[\mathfrak{p}]}, \mathfrak{p}_{[\mathfrak{p}]})$	(cf. [Vol. I, Definition 10 in I §1]), Vol. I 18
$(A : x)$	the ideal of $A$ consisting of all $a \in A$ with $ax \in A$ , Vol. I 37
$P(A, R)$	the Prüfer hull of $A$ in $R$ , Vol. I 55
$P(A)$	the Prüfer hull of $A$ , Vol. I 55
$[I :_R J]$	$(:= \{x \in R \mid xJ \subset I\})$ , Vol. I 85
$(I :_A J)$	$(:= \{a \in A \mid aJ \subset I\})$ , Vol. I 85
$\mathcal{F}(B/A)$	the set of all $B$ -regular ideals of $A$ , Vol. I 105
$Y(B/A)$	$:= \text{Spec } A \cap \mathcal{F}(B/A)$ , Vol. I 105; 1



$X(B/A)$	the image of the restriction map from $\text{Spec } B$ to $\text{Spec } A$ , Vol. I 105
$\text{Inv}(A, R)$	the set of $R$ -invertible ideals of $A$ , Vol. I 112; 126
$\prod(A)$	the set of all Prüfer ideals of $A$ , Vol. I 117
$D(A, R)$	the set of $R$ -invertible $A$ -submodules of $R$ , Vol. I 124; 126
$I^\circ$	the polar of $I$ , Vol. I 130
$\Omega(R/A)$	$:= \text{Max}(A) \cap Y(R/A)$ , Vol. I 180
$\text{PM}(A, \mathfrak{p}, R)$	the PM-hull of $(A, \mathfrak{p})$ in $R$ , Vol. I 206
$\nu_{\mathfrak{p}}$	PM-valuation belonging to a prime ideal of $A$ for $A \subset R$ a Prüfer extension, 1, 13
$Z(B/A), Z(B/A, R)$	the image of $Y(R/B)$ under the restriction map from $\text{Spec } B$ to $\text{Spec } A$ , 2, 3
$A[U]$	the subring of $R$ generated by $A \cup U$ , 9
$\text{pm}(R)$	the PM-spectrum of $R$ , 11
$S(R)$	the restricted PM-spectrum of $R$ , 11
$\nu \leq w$	(cf. Chap. 1, Sect. 3, Definition 1), 12
$\text{cent}_A(\nu)$	the center of $\nu$ on $A$ , 12, 80
$\text{pm}(R/A)$	the PM-spectrum of $R$ over $A$ , 12
$S(R/A)$	the restricted PM-spectrum of $R$ over $A$ , 12
$\nu^R$	the valuation induced on $R$ by $\nu$ , 14
$M^R$	$:= \{\nu^R \mid \nu \in M\}$ , 14
$\Lambda_{\min}$	the set of minimal elements of $\Lambda$ , 14
$\omega(R/A)$	the minimal restricted PM-spectrum of $R$ over $A$ , 14
$\text{PF}(A, R)$	the PF-hull of $A$ in $R$ , 20
$A^{\mathfrak{p}}$	the PM-hull $\text{PM}(A, \mathfrak{p}, R)$ of $(A, \mathfrak{p})$ in $R$ , 24
$R_0$	the subring of $R$ generated by $(A^{\mathfrak{p}} \mid \mathfrak{p} \in \Omega(R/A))$ , 24
$H(D)$	the irreducible hull of $D$ , 32
$C(D)$	the coirreducible core of $D$ , 32
$\text{Ir}(R/A)$	the set of irreducible overrings of $A$ in $R$ , 32
$\text{Coir}(R/A)$	the set of coirreducible overrings of $A$ in $R$ , 32
$F_J, F^i$	34
$\text{PCR}(A, T)$	the PCR-hull of $A$ in $T$ , 43
$\text{PCR}(A)$	the PCR-hull of $A$ , 44
$\nu \leq w$	the valuation $w$ being coarser than the valuation $\nu$ , 60, 168
$\nu^{\mathfrak{p}}$	the coarsening of $\nu$ induced by a prime ideal of $A_{\nu}$ with $\text{supp } \nu \subset \mathfrak{p} \subset \mathfrak{p}_{\nu}$ , 64

$\bigcap_{i \in I} \text{Spec } B_i$	$:= \{\mathfrak{p} \subset R \mid \mathfrak{p} \in \text{Spec } B_i \text{ for all } i \in I\},$ 66
$X_{\mathfrak{A}}, \mathfrak{p}_{\mathfrak{A}}$	(cf. Remark 2.2.2), 66
$\bigvee_{i \in I} v_i$	(cf. Chap. 2, Sect. 2, Definition 3 & 5), 66, 68
$H_{\mathfrak{A}}^1$	(cf. Chap. 2, Sect. 2, Definition 4), 67
$\text{conv}(B)$	the $v$ -convex hull of $B$ , 76
$v_J$	$:= \bigvee_{i \in J} v_i,$ 78
$A_J$	$:= \prod_{i \in J} A_{v_i},$ 78
$\mathfrak{p}_J$	$:= \mathfrak{p}_{v_J},$ 78
$H_{v_1, v_2}, \Gamma_{v_1, v_2}, f_{v_1, v_2}$	(cf. Chap. 2, Sect. 5, Definition 1), 93
$H_{\alpha}, I(\alpha)$	(cf. Chap. 2, Sect. 5, Definition 4), 97
$J(A, R)$	the set of $A$ -submodules of $R$ , 125
$J^f(A, R)$	the set of finitely generated $A$ -submodules of $R$ , 125
$J(A)$	the set of ideals of $A$ , 125
$I \triangleleft A$	$I$ being an ideal of $A$ , 125
$J^f(A)$	the set of finitely generated ideals of $A$ , 125
$\Phi(R/A)$	the set of $R$ -regular submodules of $R$ , 125
$\Phi^f(R/A)$	the set of finitely generated $R$ -regular submodules of $R$ , 125
$\mathcal{F}(R/A)$	the set of $R$ -regular ideals of $A$ , 125
$\mathcal{F}^f(R/A)$	the set of finitely generated $R$ -regular ideals of $R$ , 125
$c_A(f)$	the content of $f$ over $A$ , 126
$S_R$	the set of $R$ -unimodular polynomials, 127
$R(X)$	the localization of $R[X]$ with respect to $S_R$ , 127
$R(X)_{\text{kr}}$	the unique smallest Kronecker subring of $R(X)$ , 128
$v'$	the Gauß extension of $v$ to $R[X]$ , 130
$v^*$	the Gauß extension of $v$ to $R(X)$ resp. $R(X, \mathcal{G})$ , 130, 136
$\mathcal{G}_f$	the filter generated by $\mathcal{G} \cap J^f(R)$ , 131
$\Phi(\mathcal{G}/A)$	the set of $\mathcal{G}$ -regular $A$ -submodules of $R$ , 131
$\Phi^f(\mathcal{G}/A)$	the set of finitely generated $\mathcal{G}$ -regular $A$ -submodules of $R$ , 131
$H_{v, \mathcal{G}}$	(cf. Chap. 3, Sect. 2, Definition 5), 132
$\mathcal{G}_{\mathfrak{q}}$	$:= \{I \in J/R \mid I \not\subset \mathfrak{q}\},$ 133
$S_{\mathcal{G}}$	the set of polynomials $f \in R[X]$ with $c_R(f) \in \mathcal{G}$ , 134
$R(X, \mathcal{G})$	the localization of $R[X]$ with respect to $S_{\mathcal{G}}$ , 134
$I^{-1}$	$:= [A :_R I],$ 141
$\delta$	the double inverse operation $I \mapsto I^{\delta} = (I^{-1})^{-1},$ 141
$\text{Star}(R/A)$	the set of star operations on $J(A, R)$ , 142
$\text{Star}_0(R/A)$	the set of strict star operations on $J(A, R)$ , 142

$A(X, \mathcal{G}, *)$	(cf. Chap. 3, Sect. 3, Definition 3), 142, 173
$I \circ J$	the star product of $I$ and $J$ , 147
$I \sim J, I \sim_* J$	star equivalent $A$ -modules $I$ and $J$ , 148
$J_*(A, R)$	the set of $A$ -star submodules of $R$ , 148
$\tilde{D}_*(A, R)$	the set of star invertible $A$ -submodules of $R$ , 148
$J_*^f(A, R)$	the set of finite $A$ -star submodules of $R$ , 190
$\tilde{D}_*^f(A, R)$	(cf. Chap. 3, Sect. 4, Definition 3), 148
$J_\alpha(A, R), \tilde{D}_\alpha(A, R)$	(cf. Chap. 3, Sect. 4, Definition 3), 148
$\sum_{*\lambda} I_\lambda$	the star sum of the family $(I_\lambda \mid \lambda \in \Lambda)$ , 150
$I_1 +_* I_2 +_* \cdots +_* I_r$	the star sum of finitely many $I_1, \dots, I_r$ , 150
$\text{Fract}(A, R)$	the set of $R$ -fractional ideals of $A$ , 151
$\text{Fract}_*(A, R)$	$:= \text{Fract}(A, R) \cap J_*(A, R)$ , 152
$D_*(A, R)$	$:= \text{Fract}_*(A, R) \cap \tilde{D}_*(A, R)$ , 152
$D_*^f(A, R)$	$:= D_*(A, R) \cap \tilde{D}_*^f(A, R)$ , 152
$I^\nu, M^\nu$	the $\nu$ -convex hull of $I$ resp. $M$ in $R$ , 153
$\mathcal{G}_\nu$	$:= \{I \in J(R) \mid I \not\subset \text{supp } \nu\}$ , 153
$\nu(M)$	$:= \min_{x \in M} \nu(x)$ , 153
$\text{conv}_\phi$	(cf. Chap. 3, Sect. 5, Definition 3), 154
$\text{conv}_\nu$	the $\nu$ -convex hull operation, 154
$*_f$	the finite type companion of $*$ , 158, 161, 173
$\text{Star}(\mathcal{G}/A)$	the set of star operations on $\Phi(\mathcal{G}/A)$ , 160, 172
$\text{Star}_0(\mathcal{G}/A)$	the set of strict star operations on $\Phi(\mathcal{G}/A)$ , 160
$\text{kro}(*, \mathcal{G})$	the Kronecker companion for $\mathcal{G}$ , 162, 173
$\Delta_{\nu, \mathcal{G}}$	$:= \{\nu(I) \mid I \in \Phi^j(\mathcal{G}/A)\}$ , 166
$\sigma(\mathcal{G}/A, *)$	the set of equivalence classes of non-trivial $\mathcal{G}$ -special valuations on $R$ over $A$ which are $(\mathcal{G}, *)$ -regular, 168
$\tau(\mathcal{G}/A, *)$	the set of minimal elements of $\sigma(\mathcal{G}/A, *)$ , 168
$\text{WStar}(\mathcal{H}/A)$	the set of weak stars on $\Phi(\mathcal{H}/A)$ , 171
$\text{SStar}(\mathcal{H}/A)$	the set of semistars on $\Phi(\mathcal{H}/A)$ , 172
$\text{WStar}(R/A)$	the set of weak stars on $J(A, R)$ , 172
$\text{SStar}(R/A)$	the set of semistars on $J(A, R)$ , 172
$\text{Star}(R/A)$	the set of stars on $J(A, R)$ , 172
$\text{st}(\alpha_\lambda \mid \lambda \in \Lambda)$	the upper star of the family $(\alpha_\lambda \mid \lambda \in \Lambda)$ , 175
$\text{st}(\alpha_1, \dots, \alpha_n)$	the upper star of finitely many $\alpha_1, \dots, \alpha_n$ , 175
$\alpha _{\mathcal{G}}$	the restriction of $\alpha$ to $\Phi(\mathcal{G}/A)$ , 177
$S _{\mathcal{G}}$	$:= \{\alpha _{\mathcal{G}} : \alpha \in S\}$ , 177

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**Editorial Policy** (for the publication of monographs)

1. Lecture Notes aim to report new developments in all areas of mathematics and their applications - quickly, informally and at a high level. Mathematical texts analysing new developments in modelling and numerical simulation are welcome.  
Monograph manuscripts should be reasonably self-contained and rounded off. Thus they may, and often will, present not only results of the author but also related work by other people. They may be based on specialised lecture courses. Furthermore, the manuscripts should provide sufficient motivation, examples and applications. This clearly distinguishes Lecture Notes from journal articles or technical reports which normally are very concise. Articles intended for a journal but too long to be accepted by most journals, usually do not have this "lecture notes" character. For similar reasons it is unusual for doctoral theses to be accepted for the Lecture Notes series, though habilitation theses may be appropriate.
2. Manuscripts should be submitted either online at [www.editorialmanager.com/lnm](http://www.editorialmanager.com/lnm) to Springer's mathematics editorial in Heidelberg, or to one of the series editors. In general, manuscripts will be sent out to 2 external referees for evaluation. If a decision cannot yet be reached on the basis of the first 2 reports, further referees may be contacted: The author will be informed of this. A final decision to publish can be made only on the basis of the complete manuscript, however a refereeing process leading to a preliminary decision can be based on a pre-final or incomplete manuscript. The strict minimum amount of material that will be considered should include a detailed outline describing the planned contents of each chapter, a bibliography and several sample chapters.  
Authors should be aware that incomplete or insufficiently close to final manuscripts almost always result in longer refereeing times and nevertheless unclear referees' recommendations, making further refereeing of a final draft necessary.  
Authors should also be aware that parallel submission of their manuscript to another publisher while under consideration for LNM will in general lead to immediate rejection.
3. Manuscripts should in general be submitted in English. Final manuscripts should contain at least 100 pages of mathematical text and should always include
  - a table of contents;
  - an informative introduction, with adequate motivation and perhaps some historical remarks: it should be accessible to a reader not intimately familiar with the topic treated;
  - a subject index: as a rule this is genuinely helpful for the reader.

For evaluation purposes, manuscripts may be submitted in print or electronic form (print form is still preferred by most referees), in the latter case preferably as pdf- or zipped ps-files. Lecture Notes volumes are, as a rule, printed digitally from the authors' files. To ensure best results, authors are asked to use the LaTeX2e style files available from Springer's web-server at:

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