**T. Brzeziński and R. Wisbauer: Corings and Comodules (CUP, 2003). Erratum**

- page 11, 2.8: The phrase "provided $\operatorname{Im} f$ is a pure submodule of $C'$" should be added.
- page 18, exercise 2.15.3, penultimate line: Replace "an algebra morphism" by "a coalgebra morphism";
- page 20, line 10: "the dual coalgebra" should be "the dual algebra";
- page 23, lines -4/-3: to derive coassociativity of $\varrho^K$ it does not suffice to require $f$ to be $C$-pure - it should be $C \otimes_R C$-pure (which implies $C$-pure, since $C$ is a direct summand of the $R$-module $C \otimes_R C$); similar refinements are needed at other places.
- page 24, line 10: "if $K$ is a $C$-pure $R$-submodule of $M$" should read "if $K$ is a $C \otimes_R C$-pure $R$-submodule of $M$".
- page 24, lines 12/13: "$f$ is a $C$-pure morphism" should read "$f$ is a $C \otimes_R C$-pure morphism".
- page 28, section 3.12, proof of (3): second term in the equation has a misplaced parenthesis;
- page 33: In the proof of 3.18(3), $M \otimes_A C$ should be $M \otimes_R C$.
- page 43, line 2: "${}^C\mathbf{M}$" should be "$\mathbf{M}^C$".
- page 43, line -3; page 44, line 1,2 : "$\varrho_M$" should be "$\varrho^M$".
- page 47, section 4.9, proof: In the first displayed formula, $f \otimes p$ should be replaced by $fp$ (thrice).
- page 47, line -15: It should be "${}^{P^*}\varrho : P^* \to (P^* \otimes_R P) \otimes_R P^*$".
- page 53, section 4.17: (b) should be: $I = Ann_{C^*}(W)$ for some $W \subset N \in \mathbf{M}^C$; (i) should read: ...in the (right) $C$-adic topology.
- page 61, Exercise 5.13: in (4)(i), delete "(free)".
- page 63 in 6.4(d): replace "$\beta^r * f(c)$" by "$\beta^r(c) * f$".
- page 79, Exercise 8.12: in (1)(ii): read "subcoalgebra";
  in (1)(ii), (2)(i) and (iii): assume $R$ to be a field.

- page 85, line 9: "subalgebras" should be "subcoalgebras".
- page 102, line -11: "$\omega_{M,N}$ is a $D$-pure morphism" should read "$\omega_{M,N}$ is a $D \otimes_R D$-pure morphism".
- page 102, line -8: "$\omega_{M,N}$ is $D$-pure" should read "$\omega_{M,N}$ is $D \otimes_R D$-pure".
- page 102, line -7: "$\omega_{L,M}$ is $C$-pure" should read "$\omega_{L,M}$ is $C \otimes_R C$-pure".
- page 102, line -5: "$\omega_{M,N}$ is $D$-pure and $B$-pure" should read "$\omega_{M,N}$ is $D \otimes_R D$-pure and $B \otimes_R B$-pure".
- page 182, line 18: "$f$ is $\mathcal{C}$-pure as a right $A$-morphism" should read "$f$ is $\mathcal{C} \otimes_A \mathcal{C}$-pure as a right $A$-morphism".
- page 182, lines 23 & 26: "$\mathcal{C}$-pure" should read "$\mathcal{C} \otimes_A \mathcal{C}$-pure".
- page 187, line -8: $\mathbf{M}^C$ should be replaced by $\mathbf{M}^{\mathcal{C}}$.
- page 189, line 14: "coalgebra" should be "coring".
- page 191, line -4: "(b) $\Rightarrow$ (c)" should be replaced by "(d) $\Rightarrow$ (c)".
- page 208: Statement (2) in 19.22 is incorrect and should be removed.
- page 213: In 20.5, the statement: *If* $\mathbf{M}^{\mathcal{C}}$ *is closed under essential extensions, then* $\mathrm{Rat}^{\mathcal{C}}$ *is exact* is not true and should be removed.
- page 220: In 21.6 and 21.7, "${}_A\mathcal{C}$ flat" should be "$\mathcal{C}_A$ flat".
- page 224, line 10: "$\omega_{M,N}$ is a $\mathcal{D}$-pure morphism" should read "$\omega_{M,N}$ is a $\mathcal{D} \otimes_B \mathcal{D}$-pure morphism".
- page 224, line 14: "$\omega_{M,N}$ is $\mathcal{D}$-pure" should read "$\omega_{M,N}$ is $\mathcal{D} \otimes_B \mathcal{D}$-pure".
- page 224, line 15: "$\omega_{L,M}$ is $\mathcal{C}$-pure" should read "$\omega_{L,M}$ is $\mathcal{C} \otimes_A \mathcal{C}$-pure".
- page 224, lines 17/18: "$\omega_{M,N}$ is $\mathcal{D}$-pure in ${}_B\mathbf{M}$ and $\mathcal{D}'$-pure in $\mathbf{M}_{B'}$" should read "$\omega_{M,N}$ is $\mathcal{D} \otimes_B \mathcal{D}$-pure in ${}_B\mathbf{M}$ and $\mathcal{D}' \otimes_{B'} \mathcal{D}'$-pure in $\mathbf{M}_{B'}$, and $I_D \otimes \omega_{M,N}$ is $\mathcal{D}'$-pure in $\mathbf{M}_{B'}$".
- page 230, 23.1: In 23.1 the assumptions: for all right $\mathcal{C}$-comodules, the right $B$-module map $\varrho^M \otimes I_{F(\mathcal{C})} - I_M \otimes {}^{F(\mathcal{C})}\varrho$ is $\mathcal{D} \otimes_B \mathcal{D}$-pure and $F$ preserves kernels should be added. A sufficient condition for the former is that ${}_B\mathcal{D}$ is a flat module.

- page 231: In 23.2 statement (5) only holds under additional conditions (which imply associativity of the tensor products concerned).

- page 237: In 23.10 the conditions on $Y$ include that it is faithfully coflat in $\mathbf{M}^{\mathcal{C}}$; this is not necessary to get the equivalence. It is sufficient (and necessary) to require that $Y$ is a $(B, \mathcal{C})$-bicomodule that is $(B, \mathcal{C})$-quasifinite and a $(B, \mathcal{C})$-injector-cogenerator (see corrections for 23.12).

- page 238, line 17: "faithfully flat" should be "faithfully coflat".

- page 238: In 23.12, (a) does not imply the conditions (b),(c) (not covered by 23.11); they should be replaced by

  (b) there exists a $(\mathcal{D}, \mathcal{C})$-bicomodule $Y$ that is $(B, \mathcal{C})$-quasifinite, a $(B, \mathcal{C})$-injector-cogenerator, and $e_{\mathcal{C}}(Y) \simeq \mathcal{D}$ as corings;

  (c) there exists a $(\mathcal{C}, \mathcal{D})$-bicomodule $X$ that is $(A, \mathcal{D})$-quasifinite, an $(A, \mathcal{D})$-injector-cogenerator, and $e_{\mathcal{C}}(Y) \simeq \mathcal{D}$ as corings.

  where $Y$ *is a* $(B, \mathcal{C})$*-injector-cogenerator* means that for any injective cogenerator $Q$ in $\mathbf{M}_B$, $Q \otimes_B Y$ is an injective cogenerator in $\mathbf{M}^{\mathcal{C}}$.

- page 239: Proof (a) $\Leftrightarrow$ (b): It follows from the defining isomorphism that $Y$ is a $(B, \mathcal{C})$-injector-cogenerator if and only if the functor $h_{\mathcal{C}}(Y, -)$ is faithful and exact, i.e., $h_{\mathcal{C}}(Y, \mathcal{C})$ is faithfully coflat as left $\mathcal{C}$-comodule. This implies that $Y$ is faithfully coflat as left $\mathcal{D}$-comodule and then essentially the proof of 23.10 can be followed.

- page 243, item 24.8: In the definition of a pure morphism of corings the map $\omega_{N, B\otimes_A \mathcal{C}}$ should be required to be $\mathcal{C} \otimes_A \mathcal{C}$-pure. The subsequent sentence needs obvious adaption.

- page 246, line -2: $\mathrm{Hom}^{\mathcal{C}}(M, B \otimes_A \mathcal{C}))$ should read $\mathrm{Hom}^{\mathcal{C}}(M, B \otimes_A \mathcal{C})$.

- page 320, 31.25: It can be shown that any left $\mathcal{H}$-comodule $M$ can be equipped with a unique right A-module structure such that $\mathrm{Im}\,({}^M\varrho) \subseteq \mathcal{H} \times_A M$ (cf. page 240 in [G. Böhm, *Galois theory for Hopf algebroids*, Ann. Univ. Ferrara - Sez. VII - Sc. Mat. 51: 233–262 (2005)]), hence any left $\mathcal{H}$-comodule algebra is strict.

- page 335, 33.1: In 33.1, $B$ should be required to be a faithful $R$-module; this is needed to prove that if $\psi$ is an entwining, then $B$ is a bialgebra, in particular to show that $\varepsilon(1_B) = 1_R$.

- page 366, line 8: "an $R$-module $B$" should read "a *faithful* $R$-module $B$" (i.e., in the whole of Section 36 it is assumed that $B$ is a faithful $R$-module).

- page 382, 37.1 and pages 385–386, 37.8: The definition of a weak entwining structure is equivalent to the definition of a self-dual weak entwining structue. I.e. condition (we.2) in 37.1 should be replaced by

$$\sum_\alpha a_\alpha \otimes c^\alpha{}_{\underline{1}} \otimes c^\alpha{}_{\underline{2}} = \sum_{\alpha,\beta} a_{\beta\alpha} \otimes c_{\underline{1}}{}^\alpha \otimes c_{\underline{2}}{}^\beta.$$

- page 386 line 2: The formula (S) should read:

$$\sum_\alpha a_\alpha \otimes c^\alpha{}_{\underline{1}} \otimes c^\alpha{}_{\underline{2}} = \sum_{\alpha,\beta} a_{\beta\alpha} \otimes c_{\underline{1}}{}^\alpha \otimes c_{\underline{2}}{}^\beta. \qquad (S)$$

- page 392 line 16: "$b_{\underline{0}} s_B(\underline{\varepsilon}_{\mathcal{C}}(c))b'$" should be replaced by "$b s_B(\underline{\varepsilon}_{\mathcal{C}}(c))b'$".
- page 399, section 38.15, start of line 4: "$f\pi_\lambda = f_\lambda$" should be replaced by "$\pi_\lambda f = f_\lambda$";
- page 409, section 39.1, claim (2): The assumption "and $\eta_T$ is an isomorphism" should be added;
- page 409, section 39.1, proof, line after second display: "... is exact in **Ab**" should read "is exact in **A**";
- page 413, section 39.6, proof, line 2: "the action on $F(A)$ is given by $F(\phi_A)$" should be "the action on $F(A)$ is given by $F_{A,A} \circ \phi_A$";
- page 414, last displayed formula: The left hand $\Psi_{C,C,A}$ should be $\Psi_{C\otimes_T C,A}$;
- page 420, line 14: "a sequence" should be "an exact sequence".
- page 423, line 10: "$g(m)(1)$" should be "$g(-)(1)$".
- page 423, section 40.22, first line of the proof: "counit" should be "unit".
- page 435, section 42.3, page 436, line 1: in (b) should be: $I = Ann_A(W)$ for some $W \subset N \in \sigma[M]$.
- page 436, section 42.4: In (b) and (c), $N$ should be replaced by $M$.
- page 436, line -14: It should be "Choose $t_k \in T$ such that $t_k m_k = m_k$ and $a_i = m_i - t_k m_i$,".
- page 437, proof of 42.5: In the bottom row of the diagram, ${}_A\mathrm{Hom}(L, M)$ should read ${}_A\mathrm{Hom}(L, N)$.
- page 438, line 4: "$N$-dense" should read "$M$-dense".
- page 442, line 9: replace "left exactness" by "exactness".

- page 443, line 1-6: replace some "$T$" by "$\tilde{T}$".
- page 444: Statement (d) in 42.19 is not equivalent to the statements (a)–(c), only the implication (c) $\Rightarrow$ (d) holds. The (c) $\Leftrightarrow$ (d) part of the proof should be removed.
- page 445: in 43.2(2)(a) replace "left ideal" by "right ideal".
- page 446: in 43.5(e) assume $M$ to be self-projective.
- page 452: in 44.5(e) replace "$\mathcal{T}^{N_\lambda}$" by "$\mathcal{T}^{M_\lambda}$".
- page 453: In 44.6, (4) can be deleted, it is equal to (3).
- page 454: line -11: assume $\lambda \neq \mu$.

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**Thank you.**