

## PUBLICATIONS OF R.B. ZHANG

- (127) G.I. Lehrer and R.B. Zhang, The second fundamental theorem of invariant theory for the orthogonal group. *Annals of Mathematics*, in press.
- (126) Y. Su and R.B. Zhang, Generalised Jantzen filtration of Lie superalgebras I, *Journal of the European Mathematical Society*, in press.
- (125) G.I. Lehrer and R.B. Zhang, Quantum group actions on rings and equivariant K-theory. *Contemporary Mathematics* **565** (2012), 115–141.
- (124) K. Coulembier and R.B. Zhang, Invariant integration on orthosymplectic and unitary supergroups. *J. Phys. A: Math. Theor.* **45** (2012) 095204 (32pp).
- (123) Su, Y.; Zhang, R. B.; Generalised Verma modules for the orthosymplectic Lie superalgebra  $\mathfrak{osp}_{k|2}$ . *J. Algebra* **357** (2012), 94–115.
- (122) G.I. Lehrer, D.K. Nakano, R.B. Zhang, Detecting cohomology for Lie superalgebras. *Adv. Math.* **228** (2011), no. 4, 2098–2115,
- (121) G.I. Lehrer, H. Zhang and R.B. Zhang, A quantum analogue of the first fundamental theorem of invariant theory, *Comm. Math. Phys.* **301** (2011), no. 1, 131–174.
- (120) N. Lam, R.B. Zhang,  $\mathfrak{u}$ -Cohomology formula for unitarizable modules over general linear superalgebras. *J. Algebra* **327** (2011), 50–70.
- (119) G.I. Lehrer and R.B. Zhang, A Temperley-Lieb analogue for the BMW algebra. *Representation Theory of Algebraic Groups and Quantum Groups*, 155–190. Progress in Mathematics **284**, Birkhuser/Springer, New York, 2010.
- (118) W.F. Ke, K.F. Lai, R.B. Zhang, Quantum codes from Hadamard matrices. *Linear Multilinear Algebra* **58** (2010), no. 7-8, 847–854.
- (117) Zhang, R. B.; Zhang, Xiao, Projective module description of embedded noncommutative spaces. *Rev. Math. Phys.* **22** (2010), no. 5, 507 - 531.
- (116) W. Sun, D. Wang, N. Xie, R. B. Zhang, Xiao Zhang, Gravitational collapse of spherically symmetric stars in noncommutative general relativity, *The European Physical Journal C* **69** (2010), 271 - 279.
- (115) Y. Z. Wu and R.B. Zhang, Unitary highest weight representations of quantum general linear superalgebra. *Journal of Algebra* **321** (2009), no. 11, 3568–3593.

- (114) Wang D.; Zhang R. B.; Zhang X.; Exact solutions of noncommutative vacuum Einstein field equations and plane-fronted gravitational waves. *The European Physical Journal C* **64** (2009), 439 – 444.
- (113) Wang, D.; Zhang, R. B.; Zhang, Xiao, Quantum deformations of Schwarzschild and Schwarzschild-de Sitter spacetimes. *Classical Quantum Gravity* **26** (2009), no. 8, 085014, 14 pp.
- (112) M. Chaichian, A. Tureanu, R.B. Zhang and Xiao Zhang, Riemannian Geometry of Noncommutative Surfaces. *Journal of Mathematical Physics*, **49** (2008) No. 073511, 26pp.
- (111) M. Chaichian, P. P. Kulish, A. Tureanu, R.B. Zhang and Xiao Zhang, Noncommutative fields and actions of twisted Poincaré algebra. *Journal of Mathematical Physics* **49**, 042302 (2008), pp16.
- (110) R.B. Zhang, Orthosymplectic Lie superalgebras in superspace analogues of quantum Kepler problems. *Communications in Mathematical Physics*, **280** (2008) No. 2, 545 - 562.
- (109) S. J. Cheng, W. Wang and R.B. Zhang, Super duality and Kazhdan-Lusztig polynomials. *Transactions of the American Mathematical Society* **360** (2008), no. 11, 5883–5924.
- (108) G.I. Lehrer, R.B. Zhang On Endomorphisms of Quantum Tensor Space. *Letters in Mathematical Physics*, **86** (2008), 209227.
- (107) Y. Billig, A. Molev and R.B. Zhang, Differential equations in vertex algebras and simple modules for the Lie algebra of vector fields on a torus. *Advances in Mathematics* **218**, (2008) 11972 - 2004.
- (106) Zhang, G.; Zhang, R.B.; [Equivariant vector bundles on quantum homogeneous spaces](#). *Mathematical Research Letters*, **15** (2008) 297 - 307.
- (105) Yucai Su and R.B. Zhang, Cohomology of Lie superalgebras  $sl_{m|n}$  and  $osp_{2|2n}$ . *Proceedings of London Mathematical Society (3)* **94** (2007) 91 - 136.
- (104) Shun-Jen Cheng, Weiqiang Wang and R.B. Zhang, A Fock space approach to representation theory of  $osp(2|2n)$ . *Transformation Groups*, **12** (2007), no. 2, 209–225.
- (103) Yucai Su and R.B. Zhang, Character and dimension formulae for general linear superalgebra. *Advances in Mathematics* **211** (2007) 1-33.
- (102) G.I. Lehrer and R.B. Zhang, Strongly Multiplicity Free Modules for Lie Algebras and Quantum Groups. *Journal of Algebra* **306** (2006), no. 1, 138–174.
- (101) M.A. Chebotar, Wen-Fong Ke, P.-H. Lee, R.B. Zhang, On maps preserving zero Jordan products. *Monatshefte für Mathematik* **149** (2006) 91-101.

- (100) Hechun Zhang and R.B. Zhang, Dual canonical bases for the quantum general linear supergroup. *Journal of Algebra* **304** (2006) 1026-1058.
- (99) Ngau Lam and R.B. Zhang, Quasi-finite representations of Lie superalgebras of infinite rank, *Transactions of American Mathematical Society* **358** (2006), no. 1, 403–439.
- (98) Dobrev, V. K.; Zhang, R.B. Positive energy unitary irreducible representations of the superalgebras  $osp(1|2n, \mathbb{R})$ . *Phys. Atomic Nuclei*, **68** (2005), no. 10, 1660–1669.
- (97) Hechun Zhang and R.B. Zhang, Dual canonical bases for the quantum special linear group and invariant subalgebras. *Letters in Mathematical Physics* **73** (2005) 165-181.
- (96) M. Scheunert and R.B. Zhang, Integration on Lie supergroups: a Hopf algebra approach. *Journal of Algebra* **292** (2005), 324-342.
- (95) R B Zhang and Y M Zou. Spherical Functions On homogeneous superspaces. *Journal of Mathematical Physics* **46** (2005), no. 4, 043513, 21 pp.
- (94) P.D. Jarvis and R.B. Zhang, Resolution of the  $GL(3) \supset O(3)$  state labeling problem via  $O(3)$ -invariant Bethe subalgebra of the twisted Yangian. *Journal of Physics* **A38** (2005), L219–L226.
- (93) Shun-Jen Cheng and R.B. Zhang, Howe duality and combinatorial character formula for orthosymplectic Lie superalgebras. *Advances in Mathematics* **182** (2004), 124–172.
- (92) R.B. Zhang, Quantum superalgebra representations on cohomology groups of non-commutative bundles. *Journal of Pure and Applied Algebra* **191** (2004), 285–314.
- (91) Shun-Jen Cheng, Ngau Lam and R.B. Zhang, Character Formula for Infinite Dimensional Unitarizable Modules of the General Linear Superalgebra, *Journal of Algebra* **273** (2004), 780–805.
- (90) Shun-Jen Cheng and R.B. Zhang, Analogue of Kostant’s  $u$ -cohomology formula for the general linear superalgebra. *International Mathematics Research Notices*, (2004), No. 1, 31-53.
- (89) A. I. Molev, V. N. Tolstoy, R.B. Zhang, On irreducibility of tensor products of evaluation modules for the quantum affine algebra. *Journal of Physics* **A37** (2004), 2385–2399.
- (88) V.K. Dobrev, A.M. Miteva, R.B. Zhang, and B.S. Zlatev, On the Unitarity of  $D=9,10,11$  Conformal Supersymmetry. *Czechoslovak Journal of Physics* **54** (2004), 1249-1256.

- (87) Dobrev, V. K.; Zhang, R.B.; Zlatev, B. S. On the unitarity of  $D = 9, 10, 11$  conformal supersymmetry. *Quantum theory and symmetries*, 71–76, World Sci. Publ., Hackensack, NJ, 2004.
- (86) Lai, K. F. and Zhang, R.B. Multiplicity free actions of quantum groups and generalized Howe duality. *Letters in Mathematical Physics* **64** (2003), no. 3, 255–272.
- (85) R.B. Zhang, Howe Duality and the quantum general linear group, *Proceedings of American Mathematical Society*, **131** (2003), 2681-2692.
- (84) M. Scheunert and R.B. Zhang, The general linear supergroup and its Hopf superalgebra of regular functions, *Journal of Algebra*, **254** (2002), no. 1, 44–83.
- (83) R.B. Zhang, Quantum enveloping superalgebras and link invariants. *Journal of Mathematical Physics* **43** (2002) 2029–2048.
- (82) M. Scheunert and R.B. Zhang, Invariant integration on classical and quantum Lie supergroups. *Journal of Mathematical Physics* **42** (2001) 3871-3898.
- (81) A. L. Carey, A. Paolucci and R.B. Zhang, Quantum group duality and the Cuntz algebra. *Annales Henri Poincare* **1** (2000) 1097-1122.
- (80) R.B. Zhang, Structure and representations of the quantum supergroup  $OSP_q(2|2n)$ . *Journal of Mathematical Physics* **41** (2000) 6639-6656.
- (79) R.B. Zhang, Quantum supergroups and non-commutative superspaces. *Proceedings of the International Meeting on Frontiers in Physics, 1998*. Eds S.P. Chia and D.A. Bradley, World Scientific, Singapore (2000), pp397-400.
- (78) P. G. Luan, H. C. Lee and R.B. Zhang, Coloured solutions of the Yang-Baxter equation from representations of  $U_q\mathfrak{gl}(2)$ . *Journal of Mathematical Physics* **41** (2000) 6529-6543.
- (77) R.B. Zhang, Representations of affine  $\mathfrak{osp}(1|2)$  and vector coherent states. *Modern Physics Letters* **A35** (1999) 2419-2425.
- (76) M. Scheunert and R.B. Zhang, The second cohomology of  $sl(m|1)$  with coefficients in its enveloping algebra is trivial. *Letters in Mathematical Physics*, **47** (1999) 33-48.
- (75) J. Van der Jeugt and R.B. Zhang, Characters and composition factor multiplicities for the Lie superalgebra  $\mathfrak{gl}(m/n)$ . *Letters in Mathematical Physics*, **47** (1999) 49-61.
- (74) A. R. Gover and R.B. Zhang, Geometry of quantum homogeneous vector bundles and representation theory of quantum groups. I. *Reviews in Mathematical Physics* **11** (1999) 533-552.
- (73) H. C. Lee and R.B. Zhang, Geometry and representations of the quantum supergroup  $OSP_q(1|2n)$ . *Journal of Mathematical Physics*, **40** (1999) 3175-3190.

- (72) R.B. Zhang, Structure and representations of the quantum general linear supergroup. *Communications in Mathematical Physics* **195** (1998) 525-547.
- (71) M. Scheunert and R.B. Zhang, Cohomology of Lie superalgebras and of their generalisations. *Journal of Mathematical Physics*, **39** (1998) 5024-5061.
- (70) R.B. Zhang, Geometry of quantum homogeneous vector bundles and representation theory of quantum groups. *Lie Theory and its Applications in Physics II*, Eds. H.-D. Doebner, V.K. Dobrev, J. Hilgert World Scientific (1998) pp. 350-361.
- (69) R.B. Zhang, Noncommutative differential geometry of quantum homogeneous vector bundles. *Proceedings of the 22nd International Colloquium on Group Theoretical Methods in Physics, Hobart, Australia, 13-17 July 1998*, Eds. S. P. Corneyn, R. Delbourgo and P. D. Jarvis, International Press (1998) pp. 443-447.
- (68) R.B. Zhang, Geometry of Quantum homogeneous supervector bundles and representation theory of quantum general linear supergroup. *Proceedings of 5th Wigner Symposium, 25-29 August 1997, Vienna*, edited by P. Kasperkovitz and D. Grau, World Scientific (1998), pp. 37-39.
- (67) A. Carey, B. L. Wang, R.B. Zhang and J. McCarthy, Seiberg-Witten monopoles in three dimensions. *Letters in Mathematical Physics*, **39** (1997) 213-228.
- (66) R.B. Zhang, Topological invariants of 3-Manifolds and Exceptional Quantum Groups. *Letters in Mathematical Physics* **41** (1997) 1-11.
- (65) R.B. Zhang, Symmetrizable Quantum affine superalgebras and their representations. *Journal of Mathematical Physics* **38** (1997) 535-543.
- (64) R. Delbourgo and R.B. Zhang, Minimal uncertainty states for quantum groups. *Journal of Physics A* **30** (1997) L313-L316.
- (63) R.B. Zhang, Bott-Borel-Weil Construction for Quantum Supergroup  $U_q(gl(m|n))$ . *Journal of Mathematical Physics* **38** (1997) 3863-3884.
- (62) R.B. Zhang, Vector coherent state realization of representations of the affine lie algebra  $\widehat{sl}(2)$ . *Journal of Physics A* **30** (1997) 6545-6551.
- (61) R.B. Zhang, The  $gl(M|N)$  super Yangian and its finite dimensional representations. *Letters in Mathematical Physics* **37** (1996) 419-434.
- (60) R.B. Zhang and H. C. Lee, Lickorish invariant and quantum  $OSP(1|2)$ . *Modern Physics Letters A* **11** (1996) 2397-2406.
- (59) R.B. Zhang and A. L. Carey, Quantum Groups at odd roots of unity and topological invariants of 3-manifolds. *Communications in Mathematical Physics*, **182** (1996) 619-636.
- (58) R.B. Zhang, Quantum supergroups and topological invariants of three-manifolds. *Reviews in Mathematical Physics* **7** (1995) 809-831.

- (57) R.B. Zhang, The quantum super Yangian and casimir operators of  $U_q(gl(M|N))$ . *Letters in Mathematical Physics* **33** (1995) 263-272.
- (56) R.B. Zhang, Representations of super Yangian. *Journal of Mathematical Physics* **36** (1995) 3854-3865.
- (55) R.B. Zhang, Three-manifold invariants arising from  $U_q(osp(1|2))$ . *Modern Physics Letters A* **16** (1994) 1453-1465.
- (54) J. R. Links and R.B. Zhang, Multiparameter link invariants from quantum supergroups. *Journal of Mathematical Physics* **35** (1994) 1377-1386.
- (53) P.D. Jarvis, R.C. Warner, C.M. Yung and R.B. Zhang, The BRST operator of  $U_q(sl(2))$  and real forms. *Journal of Physics A* **27** (1994) 1787-1790.
- (52) J. R. Links and R.B. Zhang, Induced module construction for highest weight representations of  $U_q(gl(n))$  at roots of unity. *Journal of Physics A* **27** (1994) L861-L869.
- (51) R.B. Zhang, A Two Parameter Quantization of  $sl(2/1)$  and its Finite Dimensional Representations. *Journal of Physics A* **27**(1994) 817-829.
- (50) M.D. Gould, R.B. Zhang and A.J. Bracken, Quantum Double construction for graded hopf algebras. *Bulletin of the Australian Mathematical Society* **47** (1993) 353-375.
- (49) R.B. Zhang, Finite dimensional representations of the quantum supergroup  $U_q(gl(m/n))$ . *Journal of Mathematical Physics* **34**(1993) 1236-1254.
- (48) R.B. Zhang, Finite dimensional representations of  $U_q(C(n))$  at arbitrary  $q$ . *Journal of Physics A* **26** (1993) 7041-7059.
- (47) J. R. Links, M. D. Gould and R.B. Zhang, Quantum supergroups, link polynomials and representations of the braid generators. *Reviews in Mathematical Physics*, **5** (1993) 345-361.
- (46) J. R. Links and R.B. Zhang, Eigenvalues of Casimir invariants of  $U_q(gl(m|n))$ . *Journal of Mathematical Physics*, **34** (1993) 6016-6024.
- (45) R.B. Zhang, Braid Group Representations Arising from Quantum Supergroups with Arbitrary  $q$  and Link Polynomials. *Journal of Mathematical Physics* **33** (1992) 3918-3930.
- (44) R.B. Zhang, Universal  $L$ -operator and invariants of the quantum supergroup  $U_q(gl(m/n))$ . *Journal of Mathematical Physics*, **33** (1992) 1970-1979.
- (43) R.B. Zhang, Finite dimensional representations of  $U_q(osp(1/2n))$  and its connection with quantum  $so(2n+1)$ . *Letters in Mathematical Physics* **25** (1992) 317-326.

- (42) R.B. Zhang, A Two Parameter Quantization of  $osp(4/2)$ . *Journal of Physics* **A25** (1992) L991-L995.
- (41) P.D. Jarvis, R.C. Warner, C.M. Yung and R.B. Zhang, BRST cohomology for  $U_q(sl(2))$  representations. *Journal of Physics* **A25** (1992) L895-L900.
- (40) R.B. Zhang, M.D. Gould and A.J. Bracken, Quantum group invariants and link polynomials. *Communications in Mathematical Physics* **137** (1991) 13-28.
- (39) R.B. Zhang, M.D. Gould and A.J. Bracken, From representations of the braid group to solutions of the Yang -Baxter equation. *Nuclear Physics* **B354** (1991) 625-652.
- (38) M.D. Gould, R.B. Zhang and A.J. Bracken, Lie Bi-superalgebras and the graded classical Yang-Baxter equation. *Reviews in Mathematical Physics*, **3** (1991) 223-240.
- (37) R.B. Zhang, M.D. Gould and A.J. Bracken, Solutions of the graded classical Yang-Baxter equation and integrable systems. *Journal of Physics* **A24** (1991) 1185-1197.
- (36) M.D. Gould, R.B. Zhang and A.J. Bracken, Generalized Gelfand invariants and characteristic identities for quantum groups. *Journal of Mathematical Physics*, **32** (1991) 2298-2303.
- (35) R.B. Zhang, Graded representations of the Temperley-Lieb algebra, quantum supergroups and the jones polynomial. *Journal of Mathematical Physics* **32** (1991) 2605-2613.
- (34) R.B. Zhang, A.J. Bracken and M.D. Gould, Solution of the graded Yang-Baxter equation associated with the vector representation of  $U_q(osp(M/2n))$ . *Physics Letters* **B257** (1991) 133-139.
- (33) R.B. Zhang, M.D. Gould and A.J. Bracken, Generalized Gelfand invariants of quantum groups. *Journal of Physics* **A24** (1991) 937-943.
- (32) R.B. Zhang and M.D. Gould, Universal  $R$ -matrices and invariants of quantum supergroups. *Journal of Mathematical Physics* **32** (1991) 3261-3267.
- (31) A.J. Bracken, D.S. McAnally, R.B. Zhang and M.D. Gould, A  $q$ -analog of Bargmann space and its scalar product. *Journal of Physics* **A24** (1991) 1379-1391.
- (30) R.B. Zhang, Multi-parameter dependent solutions of the Yang-Baxter equation. *Journal of Physics* **A24** (1991) L535-L544.
- (29) R.B. Zhang, Invariants of the quantum supergroup  $U_q(gl(m/1))$ . *Journal of Physics* **A24** (1991) L1327-L1332.
- (28) A.J. Bracken, M.D. Gould and R.B. Zhang, Quantum supergroups and solutions of the Yang-Baxter equation. *Modern Physics Letters* **A5**(1990) 831-840.

- (27) P. D. Jarvis and R.B. Zhang,  $c = 1$  coset models and their fusion algebras, *International Journal of Modern Physics* **B4** (1990) 979-993.
- (26) M.D. Gould and R.B. Zhang, Classification of Star and Grade Star Irreps of  $gl(m|1)$ . *Journal of Mathematical Physics* **31** (1990) 1524-1534.
- (25) R.B. Zhang and M.D. Gould, Classification of star and grade star representations of  $C(n)$ . *Journal of Mathematical Physics* **31** (1990) 1889-1897.
- (24) M.D. Gould and R.B. Zhang, Unitary representations of basic classical Lie superalgebras. *Letters in Mathematical Physics* **20** (1990) 221-229.
- (23) M.D. Gould and R.B. Zhang, Classification of Star Irreps of  $gl(m|n)$ . *Journal of Mathematical Physics* **31** (1990) 2552-2559.
- (22) R. Delbourgo and R.B. Zhang, Grassmannian Kaluza-Klein theory and the standard model. *Physical Review* **D38** (1989) 2490-2497.
- (21) P.D. Jarvis and R.B. Zhang, Extended algebras at  $c = 1$ , coset models and the fusion rules. *Physics Letters* **B225** (1989) 112-116.
- (20) P.D. Jarvis and R.B. Zhang,  $c = 1$  coset models and their fusion algebras. Proceedings of the conference on 'The Yang-Baxter Equation and Conformal Field Theories' at Canberra, Australia. Editors: M. N. Barber and P. A. Pearce.
- (19) P.D. Jarvis and R.B. Zhang, Affine superalgebras, unitary representations and the Sugawara construction. *Nuclear Physics* **B313** (1989) 205-219.
- (18) P.D. Jarvis and R.B. Zhang, Unitary Sugawara construction for affine superalgebras. *Physics Letters* **B215** (1989) 695-700.
- (17) R. Delbourgo and R.B. Zhang, Characteristic Features of Vector Chaos, *Australian Journal of Physics* **42** (1989) 113-128.
- (16) A.J. Bracken and R.B. Zhang, The equivalence of two character formulae for typical and singly atypical irreducible modules of  $sl(m/n)$ . *Journal of Physics* **A22** (1989) L1049-1053.
- (15) R.B. Zhang, Lagrangian formulation of open and closed p-adic strings. *Physics Letters* **B209** (1988) 229-332.
- (14) R. Delbourgo and R.B. Zhang, Fermionic dimensions and Kaluza-Klein theory. *Physics Letters* **B202** (1988) 296-300.
- (13) R. Delbourgo, S. Twisk and R.B. Zhang, Grand unification and Grassmannian Kaluza-Klein theory. *Modern Physics Letters* **A3** (1988) 1037-1078.
- (12) R. Delbourgo, P.D. Jarvis, R.B. Zhang and G. Thompson, Gauge fixing of string-like models via  $osp(D/2)$ . *Modern Physics Letters* **A3** (1988) 303-309.
- (11) S. Twisk and R.B. Zhang,  $SP(2)$ -BRST. *Modern Physics Letters* **A3** (1988) 1169-1176.

- (10) G. Thompson and R.B. Zhang, Nonperturbative method in field theory: the gauge technique. *Physical Review* **D35** (1987) 631-635.
- (9) G. Thompson and R.B. Zhang, Schwinger models in arbitrary gauges and at finite temperature. *Journal of Physics* **G13** (1987) L93-L96.
- (8) G. Thompson and R.B. Zhang, A gauge principle yielding consistent chiral theories. *Modern Physics Letters* **A2** (1987) 869-872.
- (7) G. Aldazabal, F. Hussain and R.B. Zhang, Superconformal invariance and dilaton coupling in string theory. *Physics Letters* **B185** (1987) 89-93.
- (6) I.G. Koh and R.B. Zhang, Stochastic quantization and random surface approach to Polyakov string Theory. *Physical Review* **D35** (1987) 3906-3914.
- (5) G. Aldazabal, A. Diaz and R.B. Zhang, Nonlinear Sigma Models on Arbitrary Genus Riemann Surfaces. *Physics Letters* **B194** (1987) 207-214.
- (4) D. Sahdev and R.B. Zhang, A comment on the covariant spectrum of the open bosonic string. *Physics Letters* **B176** (1986) 61-66.
- (3) R.B. Zhang, The Gauge Technique. *University of Tasmanian Ph.D thesis*, (1985).
- (2) R.B. Zhang, Gluon propagator and transverse vertices. *Physical Review* **D31** (1985) 1512-1514.
- (1) R. Delbourgo and R.B. Zhang, Transverse vertices in electrodynamics and the gauge technique. *Journal of Physics* **A17** (1984) 3593-3607.