

**Benjamin Cahen**

*Berezin-Weyl quantization for Cartan motion groups*

Comment.Math.Univ.Carolin. 52,1 (2011) 127–137.

**Abstract:** We construct adapted Weyl correspondences for the unitary irreducible representations of the Cartan motion group of a noncompact semisimple Lie group by using the method introduced in [B. Cahen, *Weyl quantization for semidirect products*, Differential Geom. Appl. **25** (2007), 177–190].

**Keywords:** semidirect product, Cartan motion group, unitary representation, semisimple Lie group, symplectomorphism, coadjoint orbit, Weyl quantization, Berezin quantization

**AMS Subject Classification:** 22E45, 22E46, 22E70, 22E15, 81S10, 81R05

#### REFERENCES

- [1] Ali S.T., Engliš M., *Quantization methods: a guide for physicists and analysts*, Rev. Math. Phys. **17** (2005), no. 4, 391–490.
- [2] Berezin F.A., *Quantization*, Izv. Akad. Nauk SSSR Ser. Mat. **38** (1974), 1116–1175.
- [3] Cahen B., *Deformation program for principal series representations*, Lett. Math. Phys. **36** (1996), 65–75.
- [4] Cahen B., *Quantification d'une orbite massive d'un groupe de Poincaré généralisé*, C. R. Acad. Sci. Paris Sér. I Math. **325** (1997), 803–806.
- [5] Cahen B., *Contractions of  $SU(1, n)$  and  $SU(n + 1)$  via Berezin quantization*, J. Anal. Math. **97** (2005), 83–102.
- [6] Cahen B., *Weyl quantization for semidirect products*, Differential Geom. Appl. **25** (2007), 177–190.
- [7] Cahen B., *Weyl quantization for principal series*, Beiträge Algebra Geom. **48** (2007), no. 1, 175–190.
- [8] Cahen B., *Contraction of compact semisimple Lie groups via Berezin quantization*, Illinois J. Math. **53** (2009), no. 1, 265–288.
- [9] Cahen B., *Contraction of discrete series via Berezin quantization*, J. Lie Theory **19** (2009), 291–310.
- [10] Cahen B., *Weyl quantization for the semi-direct product of a compact Lie group and a vector space*, Comment. Math. Univ. Carolin. **50** (2009), no. 3, 325–347.
- [11] B. Cahen, *A contraction of the principal series by Berezin-Weyl quantization*, Univ. Metz, preprint, 2010.
- [12] Cahen M., Gutt S., Rawnsley J., *Quantization on Kähler manifolds I. Geometric interpretation of Berezin quantization*, J. Geom. Phys. **7** (1990), 45–62.
- [13] Cotton P., Dooley A.H., *Contraction of an adapted functional calculus*, J. Lie Theory **7** (1997), 147–164.
- [14] Dooley A.H., Rice J.W., *On contractions of semisimple Lie groups*, Trans. Amer. Math. Soc. **289** (1985), 185–202.
- [15] Folland B., *Harmonic Analysis in Phase Space*, Princeton Univ. Press, Princeton, 1989.
- [16] Helgason S., *Differential Geometry, Lie Groups and Symmetric Spaces*, Graduate Studies in Mathematics, 34, American Mathematical Society, Providence, Rhode Island, 2001.
- [17] Hörmander L., *The Analysis of Linear Partial Differential Operators*, Vol. 3, Section 18.5, Springer, Berlin, Heidelberg, New-York, 1985.
- [18] Kirillov A.A., *Lectures on the Orbit Method*, Graduate Studies in Mathematics, 64, American Mathematical Society, Providence, Rhode Island, 2004.
- [19] Knapp A.W., *Representation Theory of Semisimple Groups. An Overview Based on Examples*, Princeton Math. Series, 36, Princeton University Press, Princeton, NJ, 1986.
- [20] B. Kostant, *Quantization and unitary representations*, in Modern Analysis and Applications, Lecture Notes in Mathematics, 170, Springer, Berlin, Heidelberg, New-York, 1970, pp. 87–207.
- [21] Mackey G., *On the analogy between semisimple Lie groups and certain related semi-direct product groups*, in Lie Groups and their Representations, I.M. Gelfand Ed., Hilger, London, 1975.

- [22] Rawnsley J.H., *Representations of a semi direct product by quantization*, Math. Proc. Camb. Phil. Soc. **78** (1975), 345–350.
- [23] Simms D.J., *Lie Groups and Quantum Mechanics*, Lecture Notes in Mathematics, 52, Springer, Berlin, Heidelberg, New-York, 1968.
- [24] Taylor M.E., *Noncommutative Harmonic Analysis*, Mathematical Surveys and Monographs, 22, American Mathematical Society, Providence, Rhode Island, 1986.
- [25] Voros A., *An algebra of pseudo differential operators and the asymptotics of quantum mechanics*, J. Funct. Anal. **29** (1978), 104–132.
- [26] Wallach N.R., *Harmonic Analysis on Homogeneous Spaces*, Pure and Applied Mathematics, 19, Marcel Dekker, New-York, 1973.
- [27] Wildberger N.J., *On the Fourier transform of a compact semisimple Lie group*, J. Austral. Math. Soc. Ser. A **56** (1994), 64–116.