

Natural and projectively equivariant quantization

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Summary

One deals in this work with the existence and the uniqueness of natural projectively equivariant quantizations by means of the theory of Cartan connections.

One shows that a natural projectively equivariant quantization exists for differential operators acting between λ and μ -densities if and only if the corresponding $sl(m+1, \mathbb{R})$ -equivariant quantization on \mathbb{R}^m exists. With this end in view, one writes the quantization by means of a formula in terms of the normal Cartan connection associated to the projective structure of a connection.

One deduces next an explicit formula for the natural projectively equivariant quantization.

One shows the non-uniqueness of such a quantization by means of the curvature of the normal Cartan connection.

Finally, one shows the existence of natural and projectively equivariant quantizations for differential operators acting between sections of other natural fiber bundles transposing the method used in \mathbb{R}^m to analyse the existence of $sl(m+1, \mathbb{R})$ -equivariant quantizations, this method being linked to the Casimir operator.