

Natural and  
projectively  
equivariant  
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Fabian Radoux

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# Natural and projectively equivariant quantizations

Fabian Radoux

Eötvös Lorand University, Budapest

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## Introduction

- At the origin :  $qp \rightarrow QP$

$$qp \rightarrow \frac{1}{2}(QP + PQ)$$

with  $P = \partial_x$  ;  $Q = x$ .

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- Quantization :  $Q : \mathcal{S}(M) \mapsto \mathcal{D}_{\frac{1}{2}}(M)$

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 $\#Q : Q(L_X S) = L_X Q(S) \forall$  vector field  $X$

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$$\exists Q : L_X Q(S) = Q(L_X S) \forall X \in \mathfrak{sl}(m+1, \mathbb{R})$$

- Method of the Casimir operator :

$$\mathcal{C} : \mathcal{S}(\mathbb{R}^m) \mapsto \mathcal{S}(\mathbb{R}^m) \quad ; \quad \mathcal{C} : \mathcal{D}(\mathbb{R}^m) \mapsto \mathcal{D}(\mathbb{R}^m)$$

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"Curved" case :

- $Q(\nabla) : \mathcal{S}^3(M) \mapsto \mathcal{D}^3(M)$

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- Conjecture :  $Q(\nabla) : \mathcal{S}(M) \mapsto \mathcal{D}(M)$

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- M. Bordemann method :

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# Natural and projectively equivariant quantizations

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- Questions :

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- Questions : Critical values of  $\delta$

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One finds then :

$$Q_M(\nabla, S)(f) = p^{*-1} \left( \sum_{l=0}^k C_{k,l} \langle \text{Div}^{\omega^l} p^* S, \nabla_s^{\omega^{k-l}} p^* f \rangle \right),$$

$$\text{with } C_{k,l} = \frac{(\lambda + \frac{k-1}{m+1}) \dots (\lambda + \frac{k-l}{m+1})}{\gamma_{2k-1} \dots \gamma_{2k-l}} \binom{k}{l}, \quad \forall l \geq 1, \quad C_{k,0} = 1$$

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Affine quantization  $Q_{Aff}$  :  
 $\partial_i$

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Application  $\gamma :$

$$\mathcal{L}_{X^h} Q_{Aff}(S)(f) = Q_{Aff}((L_{X^h} + \gamma(h))S)(f)$$

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Quantization :

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Then :

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• Conclusion : "Flat" case  
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