Handout on 180222

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Dror Bar-Natan: Talks: Matemale-1804:

Solvable Approximations of the Quantum sl_2 Portfolio

Joint with Roland van der Veen

ωεβ:=http://drorbn.net/mm18/

Our Main Theorem (loosely stated). Everything that matters in the quantum sl_2 portfolio can be continuously expressed in terms of docile perturbaed Gaussians using solvable approximations. ◯

Our Main Points.

- What's the "quantum sl_2 portfolio"?
- What in it "matters" and why? (the most important question)
- What's "solvable approximation"? What's "continuously"?
- What are "docile perturbaed Gaussians"?
- Why do they matter? (2^{nd} most important)
- How proven? (docile)
- How implemented? (sacred)

The quantum sl_2 Portfolio includes a classical universal enveloping algebra CU, its quantization QU, their tensor powers $CU^{\otimes S}$ and $QU^{\otimes S}$ with the "tensor operations" $\otimes$, their products m_k^{ij}, coproducts Δ^i_{jk} and antipodes S_i, their Cartan automophisms $C\theta\colon CU \to CU$ and $Q\theta\colon QU \to QU$, the "dequantizators" $A\mathbb{D}\colon QU \to CU$ and $S\mathbb{D}\colon QU \to CU$, and most importantly, the R-matrix R and the Drinfel'd element s. All this in any PBW basis, and change of basis maps are included.

$$\begin{tikzcd} R, s \in \{QU^{\otimes S}\} \arrow[loop above, "{\otimes, m_k^{ij}, \Delta^i_{jk}, S_i, \theta}"] \arrow[r, "{A\mathbb{D}, S\mathbb{D}}"] & \{CU^{\otimes S}\} \arrow[loop above, "{\otimes, m_k^{ij}, \Delta^i_{jk}, S_i, \theta}"] \end{tikzcd}$$

doc·ile

/ˈdäsəl/

adjective

ready to accept control or instruction; submissive.
"a cheap and docile workforce"

add "section of a quadratic" picture.