Stone-von Neumann Theorem in Quantum Geometry

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The configuration space of quantum geometry is the compact space $\overline{\mathcal{A}}$ of distributional connections in a principal fibre bundle with compact structure group. The corresponding Weyl algebra $\mathfrak{A}$ is generated by the continuous functions on $\overline{\mathcal{A}}$ and the pull-backs of certain homeomorphisms on $\overline{\mathcal{A}}$. The latter ones correspond to the left translations generated by the momenta in quantum mechanics. For reasonable assumptions, it has been shown recently that there is (up to unitary equivalence) only one regular representation of $\mathfrak{A}$ having a cyclic and diffeomorphism invariant vector. In this talk, the main ideas of the proof are going to be discussed.