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Marc A. Rieffel* (rieffel@math.berkeley.edu). *Vector bundles for "Matrix algebras converge to the sphere"*. Preliminary report.

On looking through the literature of high-energy quantum physics one finds statements such as “matrix algebras converge to the sphere”. Earlier I provided a general setting for understanding such statements, in which the matrix algebras are viewed as compact quantum metric spaces, and convergence is with respect to a quantum Gromov-Hausdorff-type distance. I will indicate briefly how this works.

But physicists want even more to treat structures on spheres (and other spaces), such as vector bundles, Yang-Mills functionals, Dirac operators, etc., and they want to approximate these by corresponding structures on matrix algebras. The main part of my talk will consist of indicating how to do this for vector bundles. One would like to be able to say that for two compact quantum metric spaces that are close together, to a given vector bundle on one of them there corresponds a unique vector bundle on the other. Even for ordinary compact metric spaces and ordinary Gromov-Hausdorff distance it is not so obvious how to do this. (Received August 08, 2016)