On the Parthasarathy formula for quantized irreducible flag manifolds

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The Parthasarathy formula expresses the square of the Dirac operator on a symmetric space in terms of central elements of the corresponding enveloping algebra. We investigate whether a result of this type also holds for quantized irreducible flag manifolds, using the Dolbeault-Dirac operators introduced by Krähmer and Tucker-Simmons. We show that a Parthasarathy-type formula requires certain quadratic commutation relations in the quantum Clifford algebra defined by the named authors. For quantum projective spaces these relations hold, and we obtain a result which is as close as possible to the classical case. On the other hand this is not the case for all other irreducible flag manifolds.

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