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A universal Bergman element

We present new developments in 3-graded Lie algebras, more precisely, results in which such a Lie algebra is generated by a pair: a construction of the free case over a field of characteristic zero, and also over a field of characteristic $p > 3$ (following suggestion of E. Zelmanov). A comparison with KKT algebras is provided. Finally, we introduce the formal canonical kernel and explain why this is a natural candidate for a universal Bergman element, to be defined on the formal completion of the universal enveloping algebra of the above free 3-graded Lie algebra. Its expression reduces to the usual Bergman operator for the adjoint representation; all of this is also motivated by recent analytic expressions for Bergman kernels of holomorphic discrete series representations obtained in terms of the canonical kernel function.