

Fixed Points and Quantization of Some Symplectic Symmetric Spaces

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Abstract

Results about formal star products on Poisson manifolds are abundant. However, much less is known about the existence of non-formal ones, that is, when the star product of two functions is again an actual function and not only a formal power series. In the setting of a symplectic symmetric space M , A. Weinstein has suggested an explicit ansatz for such a non-formal star product. It takes the form of an integral formula

$$(f \star_{\hbar} g)(x) = \int_{M \times M} K_{\hbar}(x, y, z) f(y) g(z) dydz.$$

The geometry of the space appears in an interesting way in the kernel K_{\hbar} , through the fixed points of the composition of the symmetries around x , y and z , and through the area of the corresponding “double triangle” (the triangle whose edges admit x , y and z as midpoints). We will present a construction which, under some hypotheses, allows to prove that such a fixed point formula indeed gives a non-formal star product, which is also equivariant. Depending on time, we will discuss some examples and obstructions.