Group Actions and Localisation on Manifolds with Boundary

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Abstract:
Given a smooth action of a compact Lie group on a manifold without boundary, it is a classical fact that the fixed point set is an embedded submanifold. The Duistermaat-Heckman localisation theorem then says that the integral of any equivariantly closed differential form localises to the fixed point set. We extend these results to manifolds with boundary. Our first observation is that the fixed point set in this setting is a neat submanifold, hence carries tubular neighbourhoods. We then prove a Duistermaat-Heckman localisation formula in which an extra boundary term appears. Lastly, if time permits, we discuss how this correction term would correspond to the eta-invariant of an appropriate Dirac operator in a hypothetical application of our theorem to loop space. This is joint work with Batu Güneysu.