

Norman Gürlebeck

Zarm, University Bremen

Source integrals for Geroch's Multipole Moments

Authors: N. Gürlebeck

Geroch's multipole moments of a stationary spacetime are defined by the asymptotic behavior of its metric near spatial infinity. They can be used to describe the spacetime sufficiently far away from the source. However, their relation to the source itself is only clarified for the leading multipole moments – the mass and, in case of axially symmetry, the angular momentum – via the Komar integrals. We describe here an algorithm to derive such source integrals for stationary and axially symmetric spacetimes also for higher multipole moments and give the first few examples explicitly. In the special case of staticity, we give all multipole moments in such a local form.