

Janko Latschev: How to construct closed forms with prescribed local properties

The goal of this talk is to outline a general procedure for deciding if on a closed manifold there is a smooth closed differential form representing a given cohomology class and satisfying certain pointwise conditions, e.g. restricting to a volume form on the leaves of a given foliation or being symplectic. Known methods deal with these questions efficiently when the condition imposed varies continuously from point to point. I will recall the basic underlying ideas, mainly going back to Schwartzman and Sullivan, and then describe some new techniques useful for dealing with some singular cases, where the form is required to vanish on a given set and satisfy the previous conditions only on the complement of this set.