

Jerzy DYDAK

Analogs of large scale invariants in topology

Abstract: M.Gromov introduced the large scale analog of the classical dimension, the asymptotic dimension. G.Yu proved that Novikov Conjecture holds for manifolds whose fundamental group has finite asymptotic dimension. Later on, G.Yu introduced Property A as a weak amenability condition on metric spaces. It turns out Novikov Conjecture holds for groups with Property A and every space of finite asymptotic dimension has Property A. A natural question is if Property A is an analog of some classical topological concept. The unexpected answer is: that concept is paracompactness. That may explain difficulties with proving Novikov Conjecture for arbitrary groups. It is well-known that a paracompact space X is of covering dimension n if and only if any map f from X to a simplicial complex K can be pushed into its n -skeleton. We use the same idea to define dimension in the coarse category. It turns out the analog of maps f from X to K is related to asymptotically Lipschitz maps, the analog of paracompact spaces are spaces related to Yu's Property A, and the dimension coincides with Gromov's asymptotic dimension. (Joint work with M.Cencelj and A.Vavpetič.)